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

- Public Funds
- \( \text{CO}_2 \) Emissions
- Private Capital
- Deployment
- Jobs

More

Less

Time
What are Programs and Products of the Connecticut Green Bank?
What are Green Bank Products and Programs

**Incentives**
- Green Bank Capital

**Co-Investment**
- Green Bank Capital

**Credit Support**
- Senior Private Capital
  - Green Bank Credit Enhancement

**Warehousing**
- Project
  - Green Bank Origination
  - Private Purchase of Portfolio
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

Solar Contracts Signed During and Since the 2012 Solarize Connecticut Pilot

Yale
CT Solar Loan (Co-Investment)
$5 MM Crowdfund to $100 MM Private

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)

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

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

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**
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.
Smart-E Loan (Credit Support)
$28 MM Loan Capital Available

- **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”

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.

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

- 2013: 100%
- 2014: 28% (72% increase)
- 2015: 49% (51% increase)
- 2016: 56% (44% increase)

Green Bank vs. private
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.

- **$30K** Smallest Size
- **$697K** Average Size
- **$8.3M** Largest Size

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

- 27% Industrial
- 13% Other
- 20% Office
- 17% Nonprofit
- 23% Retail

REFERENCES
Pace SETTERS News for Q1 of 2016
C-PACE (Warehousing)
Public-Public-Private Partnership

Hannon Armstrong Provides $100 MM Funding for Commercial Clean Energy

Growing Businesses

The Connecticut Green Bank and Hannon Armstrong have reached an agreement that will increase the deployment of energy efficiency, solar and other clean energy projects throughout the Connecticut commercial and industrial sector.

December 28, 2015
What Impacts are Being Achieved through the Connecticut Green Bank?
## Connecticu Green Bank
### Accelerate Green Energy Deployment

<table>
<thead>
<tr>
<th></th>
<th>FY 2000- FY 2011 (CCEF)</th>
<th>FY 2012- FY 2016 (CGB)¹</th>
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<tbody>
<tr>
<td><strong>Model</strong></td>
<td>VC and Subsidy</td>
<td>Financing</td>
</tr>
<tr>
<td><strong>Years</strong></td>
<td>11.00</td>
<td>5.00</td>
</tr>
<tr>
<td><strong>Energy (MW)</strong></td>
<td>43.1</td>
<td>208.2</td>
</tr>
<tr>
<td><strong>Investment ($MM)</strong></td>
<td>$349.2</td>
<td>$985.0</td>
</tr>
<tr>
<td><strong>Leverage Ratio</strong></td>
<td>1:1</td>
<td>7:1</td>
</tr>
<tr>
<td><strong>% of Funds as Loans</strong></td>
<td>10</td>
<td>50</td>
</tr>
</tbody>
</table>

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


- **Financial Statistics** – audited financial statements for the organization

- **Non-Financial Statistics** – public benefit outputs and outcomes from the organization’s activities
Developing Evaluation Standard Specifically for Green Banks

Evaluation Framework
Assessing, Monitoring, and Reporting of Program Impacts and Processes

Data Collection and Analysis Protocol
From Freedom of Information and Confidentiality to Societal Benefits and Green Bonds
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**.
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

Collaboration and Information Exchange
Attract and Deploy Private Capital
Promote and Support Green Bank Creation

REFERENCE
Information provided by the Coalition for Green Capital
INNOVATE    EDUCATE    ACTIVATE    ACCELERATE