Growing Clean Energy Markets with Green Bank/EIP Financing

Coalition for Green Capital
Jeffrey Schub, Executive Director

NASEO Annual Meeting
September 12, 2016
CGC provides expert support and advice to governments pursuing Green Bank creation

**CGC’s mission** is to accelerate the transition to the clean energy economy by establishing Green Banks at the state, federal, and international levels.

- Nonprofit 501(c)(3) organization
- CGC’s leaders have been driving Green Bank movement since ‘09
- Offices in DC & NYC
- Receives pro bono support from major international law firms
CGC is leading expert and partner for governments to stand-up dedicated clean energy finance entities

- Helped design and create 6 Green Banks, which have catalyzed over $1.5 billion in clean energy investment
- Actively working in over a dozen states in the U.S.
- Supporting federal efforts to create a National Green Bank
- Now working internationally with India and Ontario
- Leading the creation of the Global Green Bank Network in partnership with 6 Green Banks around the world
Green Banks are public or quasi-public entities that channel public & private investment to clean energy.

1. Public $’s capitalize green bank
2. Investment attracts private capital
3. Private investors fill market gaps

Government

Creation & Public Capitalization

Green Bank

Private Investors

Low Carbon Projects

Public Investment → Payback

Private Investment → Payback

Consumer Savings, Job Creation, Taxpayers Protected, GHG Reductions
Green Banks follow common principles, tailored to fit market needs & government objectives

**Green Bank Guiding Principles of Operation**

- Utilizes public dollars to **leverage** private capital
- Provides **financing** to underserved market sectors
- Is **market-oriented**, and aims to increase consumer protection, information transparency, and ease of adoption
- Is **steadfast** in the face of changing political landscape, budget changes, and administrative priorities
- Is a **flexible and adaptable** institution that reacts to market
As a focused entity (not just a program) Green Banks use multiple strategies to achieve goals

- **Market Development**
  - Contractor Training
  - Info Transparency
  - Standardization
  - Demand Aggregation

- **Multiple Finance Tools**
  - Loans
  - Credit Enhancement
  - Warehousing & Securitization

- **Innovative Mechanisms**
  - PACE/Local Improvement Charges
  - On-Bill Recovery
  - ESA’s

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Efficient & Rapid Market Growth

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Financing structured so that borrower saves money from day one – payback period becomes irrelevant

**BEFORE**

Utility Bill

**AFTER**

Efficiency Financing Payment

**Net Cash-Flow Positive!!**

Savings

Before Efficiency

With Efficiency Financing
Green Banks are a win-win-win for consumers, businesses, investors and government

<table>
<thead>
<tr>
<th>Green Bank Benefits</th>
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<tbody>
<tr>
<td><strong>Private Sector Leverage</strong></td>
</tr>
<tr>
<td>– Financial tools designed to maximize the amount of private sector investment per public dollar used</td>
</tr>
<tr>
<td><strong>Efficient Government</strong></td>
</tr>
<tr>
<td>– Provide loans to preserve public capital &amp; do deeper efficiency projects</td>
</tr>
<tr>
<td>– Work in coordination with other agencies to maximize program value</td>
</tr>
<tr>
<td><strong>Create Jobs &amp; Economic Growth</strong></td>
</tr>
<tr>
<td>– Clean energy financing enables demand for projects from contractors</td>
</tr>
<tr>
<td>– Public private partnerships create investment opportunities for lenders</td>
</tr>
<tr>
<td><strong>Put Money Back in Citizens’ Pockets</strong></td>
</tr>
<tr>
<td>– Less funding needed to support public financing than public grants</td>
</tr>
<tr>
<td>– Reduced energy bills with efficiency, renewables create monthly savings</td>
</tr>
</tbody>
</table>
Example: CT Green Bank sparks more retail private lending in residential efficiency with credit support
Example: Rhode Island IBank shows power of GB aggregation to leverage private EE investment (1 of 2)

- Efficient Building Fund (EBF) run by RI Infrastructure Bank (state GB)
- Built to finance clean energy upgrades at muni buildings across the state
- First step of process is open RFP, where energy office (OER) evaluates and ranks projects
Example: Rhode Island IBank shows power of GB aggregation to leverage private EE investment (2 of 2)

• Priority project list then send to RIIB to underwrite and finance

• RIIB buys muni GO debt from each sponsoring town.

• RIIB makes that purchase by borrowing from capital markets

• Meant to be a RIIB bond – but did private placement for short term debt
Evidence from Connecticut, with longest-running Green Bank, shows that the model works.

*CT Grows Residential Solar With More Financing While Reducing Subsidies*

Operating Green Banks have already driven $20 billion of investment, many more GBs in pipeline

<table>
<thead>
<tr>
<th>Operating Green Banks</th>
<th>Green Banks Or Similar in Development or Under Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK GIB</td>
<td>• India (National)</td>
</tr>
<tr>
<td>Australia CEFC</td>
<td>• Ontario, Canada</td>
</tr>
<tr>
<td>Japan GFO</td>
<td>• Washington, DC</td>
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<tr>
<td>Malaysia GTFS</td>
<td>• Maryland</td>
</tr>
<tr>
<td>NY Green Bank</td>
<td>• Nevada</td>
</tr>
<tr>
<td>CT Green Bank</td>
<td>• Colorado</td>
</tr>
<tr>
<td>RI Infrastructure Bank</td>
<td>• Missouri</td>
</tr>
<tr>
<td>CA CLEEN Center</td>
<td>• Pennsylvania</td>
</tr>
<tr>
<td>HI Green Infrastructure Authority</td>
<td>• Vermont</td>
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<tr>
<td>Montgomery County, MD Green Bank</td>
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</tbody>
</table>
Green Bank Trends

- Green Banks moving to new Purple & Red states
- Demand, demand, demand!!
- Must make clean energy accessible to all
- Federal government supports Green Banks
- Global recognition of Green Bank role after Paris
Green Banks are spreading across US

**CGC Now Working on Green Banks/EIPs in 15 states**

- CA
- CT
- DE
- DC
- HI
- MA
- MD
- MO
- NV
- NY
- PA
- RI
- VT
- VA

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Federal Green Bank Legislation re-introduced, taking the CT model nationwide

- Senator Chris Murphy (CT) and Rep. Chris Van Hollen (MD) introduced Green Bank Act of 2016

- Originally introduced in 2009 with strong bi-partisan support, passed House of Reps

- Bill updated based on success of CT, recognizes state role
  - The Federal Green Bank will be pass-through mechanism
  - *Will solely exist to capitalize regional/state/local entities*
  - If Green Bank meets federal definition, it is eligible for funding
  - Federal Green Bank will not do any direct project finance
Global Green Bank Network just launched, hub for new Green Bank development, knowledge sharing

- **Green Bank Creation**
  - Help Gov’t Create New Institutions

- **Attract Capital**
  - Connect Investors & DFIs with Green Banks

- **Know-How**
  - Best Practices & Data from All Green Banks
Thank You & Appendix

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Like car or house, hard to buy renewable energy or energy efficiency technology without financing.

Without financing for clean energy, you have to pay the entire cost upfront!
Common public sector approach to stimulating clean energy markets is through rebates.

A rebate is nice, because it lowers the technology cost, but it still leaves huge upfront cost. Need financing!

Upfront Cost with no Financing after Grants

Price

Rebates

$25,000

Upfront
For many large, fossil-fuel based projects, financing is ample – not so with renewables and efficiency

<table>
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<tr>
<th>Centralized Projects</th>
<th>Distributed Projects</th>
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<tbody>
<tr>
<td>Utility-scale</td>
<td>Smaller scale</td>
</tr>
<tr>
<td>Power directly to grid</td>
<td>Scattered locations</td>
</tr>
<tr>
<td>Strong credit</td>
<td>On-site energy use</td>
</tr>
<tr>
<td>Traditional project finance</td>
<td>Varying credits</td>
</tr>
<tr>
<td>Relatively easy to finance</td>
<td>Range of structures and approaches to finance</td>
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Green Banks fill the financing gap and draw in the capital needed to make clean energy markets grow.

**A Green Bank is a public financing authority that leverages private capital with limited public-purpose dollars to accelerate the growth of clean energy markets.**

- **Deploy public-purpose capital efficiently to maximize private investment**
- **Implement new market behavior and lower price to spark demand**

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**Inefficient Capital Markets**

**Clean Energy Market**

**Tepid Consumer Demand**
Green Bank plays dual role of increasing the flow of capital and building market to increase demand

Financing Projects

- Leverage public dollars
- Stimulate private investment
- Fill market gaps

Generating Demand

- Turn-key solutions
- Harmonized programs
- Local Community-based Marketing
- Trustworthy source of reliable consumer information
- Cross-agency coordination
Green Banks are flexible institutions that can employ various financing methods to suit the need.

**a. Credit Support**
- Senior Private Capital
- Green Bank Credit Enhancement
- Project

**b. Co-Investment**
- Green Bank Capital
- Project
- Private Capital

**c. Warehousing**
- Project
- Green Bank Origination
- Private Purchase of Portfolio
Green Banks recycle capital, re-leveraging private investment multiple times

**Original Investment**

- **Year 0:** Initial investment leverages private capital

**First Recycling**

- **Year 6:** Investment is fully repaid
- **Year 6:** Funds are re-loaned, attracting more private capital

**Second Recycling**

- **Year 12:** Investment is fully repaid
- **Year 12:** Funds are re-loaned, attracting more private capital

- **Year 18:** Investment is fully repaid
Range of financial tools, applied to prioritized markets, through innovative structures

**Green Bank Products & Services**
- Direct Debt
- Wholesale Debt
- Subordinated Debt
- Loan Loss Reserve
- Warehousing
- Securitization
- Standardization
- Data Collection

**Financing Mechanisms**
- On-Bill
- PACE
- ESPC

**Markets**
- Residential EE*
- Comm. & Industrial EE
- Multifamily EE
- Low income EE
- Municipalities, Univ’s, Schools and Hospitals EE
- Distributed Generation
- Community Solar
- Energy Storage
- EV’s and Charging

*EE = Energy Efficiency
Example: Connecticut’s ‘Residential Solar Tax Equity Fund’ expands customer access to rooftop solar

- Green Bank created unique public-private financing platform
- Product enables local developers to offer financing to customers who otherwise would have to pay all $ upfront

Example: PACE financing is designed to increase lending security, make building investments appealing

Commercial Building Capital Stack

- PACE is lower cost, longer term than commercial loan
- PACE repayments collected via tax assessment
- PACE lien seniority secures repayment
- PACE stays with property upon sale
Example: Connecticut’s Commercial-PACE enables secure energy efficiency investment at scale

Centralized State-wide Green Bank Administration

1. Loan
2. PACE Assessment
3. Loan Payment
4. Portfolio Securitization + Credit Support

Example: Green Bank offers standard credit enhancement to retail lenders to serve the market

- Green Bank defines terms of loan loss reserve and risk-mitigation mechanism for residential EE & RE loans
- Banks enter market with reduced risk and offer good terms

![Diagram showing the process of Green Bank offering standard credit enhancement to retail lenders to serve the market.](image)
Example: Green bank loan warehouse for small business building upgrades

- Green Bank directly issues loans for project, and builds portfolio that has scale, diversified risk
- Then sells portfolio to private investor to recycle capital
- Good for projects too small for PACE (<$100k)
Example: Green Bank can work with private partners to create programs tailored to low-moderate income

- Green Bank offers solar financing, coordination with relevant agencies, and market info
- Private party installs simple efficiency package, then solar, through single financing repayment – cash flow positive

Green Bank
-Rooftop solar financing

Private Partner
-Acquires customer
-Audit & Installation
-EE Financing

Solar Lease

Alternative Underwriting
-Utility Bill Payment History

Energy Savings Performance Contract

Low and Moderate Income Households
Green Banks drive job creation

Jobs Created Due to Connecticut Green Bank

Customers Benefitted

“I am just elated...I love the fact that the monthly payments are consistent, whether it’s month number one or month number 200, it is the same and to me that just means a lot.”
-Susan Young, first customer of new Connecticut Green Bank’s Low-Moderate Income product

“Our congregation sang praises on another level when we announced the planned improvements. Now that the boiler is replaced, everybody comes in with a smile because they are thrilled it’s warm enough to hold church services in the winter.”
-Jenice Thompson, Co-Pastor, Calvary Temple Christian Center

Governments Meeting Goals

“Connecticut’s innovative programs are reducing energy costs for households of all income levels, [and] creating local jobs. Commonsense policy is moving our state forward on multiple—and critical—fronts. Through these public-private partnerships and forward-thinking approaches, we are scaling clean energy deployment in Connecticut as we grow jobs.” —Governor Malloy, Connecticut

“Smart and innovative financing is crucial to developing renewable energy resources [...] Here in New York, we have made great progress with NY Green Bank, and we are joining with other leaders to continue spurring the growth of a clean energy economy.”

-Governor Cuomo, New York

“Rural communities represent a vast, underserved market for renewable energy across the U.S. and beyond...Today’s announcement represents an inflection point for our industry; with this new access to affordable project finance capital, distributed wind is now positioned to grow rapidly and meet customer demand for affordable wind energy in these communities.” -Russel Tencer, CEO of United Wind upon receiving construction loan financing from the New York Green Bank

“We were able to help another family to save money, save energy, and live more comfortably. That’s what we do!”
Sue Dombrowski, CorePlus Federal Credit Union

Green Banks operating around the world

Sources: OECD, “Green Investment Banks – Policy Perspective.”
Each government takes a different path to Green Bank creation, choosing suitable funding & structure

<table>
<thead>
<tr>
<th>Objective</th>
<th>Connecticut</th>
<th>New York</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create a dedicated institution that will deploy cheap and clean energy by financing mature clean energy technologies</td>
<td>Create a dedicated finance institution to animate private capital markets and increase total investment in clean energy</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Connecticut</th>
<th>New York</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Existing quasi-public grant-making entity with mixed mission</td>
<td>• Large existing state energy agency already had legal authority to provide financing</td>
<td></td>
</tr>
<tr>
<td>• Large annual system benefit charge collected from ratepayers.</td>
<td>• Large annual system benefit charge collected from ratepayers</td>
<td></td>
</tr>
<tr>
<td>• Newly elected governor sought to reform state energy apparatus</td>
<td>• Strong Governor support from the outset</td>
<td></td>
</tr>
<tr>
<td>• Bipartisan support for action</td>
<td>• Regulator controlled money</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unclear legislative path</td>
</tr>
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<table>
<thead>
<tr>
<th>Solution</th>
<th>Connecticut</th>
<th>New York</th>
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<tr>
<td>Repurpose existing entity into green bank through legislation, funded with a portion of the existing system benefit charges and RGGI proceeds</td>
<td>Create new green bank division of existing state energy agency and petition regulator to repurpose system benefit charge to capitalize the green bank</td>
<td></td>
</tr>
</tbody>
</table>
More examples of Green Bank creation

<table>
<thead>
<tr>
<th>Objective</th>
<th>Rhode Island</th>
<th>Montgomery County, MD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spark economic growth, create jobs and lower energy costs by deploying clean energy with financing mechanisms</td>
<td>Create a dedicated clean energy finance institution to reduce emissions, lower energy costs and help meet County environmental goals</td>
<td></td>
</tr>
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<tr>
<th>Conditions</th>
<th>Rhode Island</th>
<th>Montgomery County, MD</th>
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<tr>
<td>• Newly-elected Governor campaigned on platform for green bank</td>
<td>• No desire to create new government institution</td>
<td></td>
</tr>
<tr>
<td>• Minimal desire to create new institution</td>
<td>• Quasi-public instrumentality would require state approval</td>
<td></td>
</tr>
<tr>
<td>• Existing system benefit charge not a viable pool of funds</td>
<td>• County’s electric utility in the midst of a large merger</td>
<td></td>
</tr>
<tr>
<td>• Governor sought quick action</td>
<td>• No pool of existing public funds</td>
<td></td>
</tr>
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</table>

<table>
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<tr>
<th>Solution</th>
<th>Rhode Island</th>
<th>Montgomery County, MD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through annual budget bill, expanded existing quasi-public water financing authority to become state infrastructure bank. Modest start-up funding paired with existing bonding authority.</td>
<td>Legislation directing an independent non-profit be incorporated to receive County’s designation as the Green Bank. Funded by utility-merger settlement payment, negotiated by County with utility to secure County merger approval.</td>
<td></td>
</tr>
</tbody>
</table>
Growing number of Green Banks around the U.S., in addition to national GBs in UK, Australia, & Japan

<table>
<thead>
<tr>
<th>Institution</th>
<th>Eligible Technology</th>
<th>Key Products</th>
<th>Source of Funds</th>
<th>Initial Capital</th>
<th>Structure/Oversight</th>
<th>Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Connecticut Green Bank</strong></td>
<td>• Solar, fuel-cell, geothermal, biomass • Energy efficiency</td>
<td>• C-PACE • Smart-E loan • Solar Lease II • Solar Loan</td>
<td>• Utility bill surcharge • RGGI funds</td>
<td>~$35M per year</td>
<td>• Independent quasi-public • Board of Directors, appt by Governor &amp; Legislature</td>
<td>33</td>
</tr>
<tr>
<td><strong>Hawaii Green Infrastructure Authority</strong></td>
<td>• Solar (primary focus) • Energy efficiency</td>
<td>• Solar leases for LMI and non-profit sector, paired with on-bill recovery</td>
<td>• Bond issuance backed by ratepayer fee</td>
<td>$150 M</td>
<td>• Independent quasi-public • PUC oversight</td>
<td>2</td>
</tr>
<tr>
<td><strong>New York Green Bank</strong></td>
<td>• Renewable energy • Energy efficiency • Clean transportation</td>
<td>• Issued RFP for private sector financial intermediaries</td>
<td>• Utility bill surcharge • RGGI funds</td>
<td>$218.5 M</td>
<td>• PSC oversight • Division within state energy office (NYSERDA)</td>
<td>12</td>
</tr>
</tbody>
</table>
Varying capitalization sources and org structures, common principles and objectives

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<tr>
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</thead>
<tbody>
<tr>
<td>California CLEEN Center</td>
<td>• Efficiency (first priority)</td>
<td>• MUSH market efficiency</td>
<td>• Pre-existing bonding authority of the state IBank</td>
<td>~$40M</td>
<td>• Division of CA Infrastructure Bank</td>
<td>~5</td>
</tr>
<tr>
<td></td>
<td>• Renewable generation</td>
<td>• Commercial market efficiency</td>
<td></td>
<td></td>
<td>• Board of Directors, appt by Governor</td>
<td></td>
</tr>
<tr>
<td>Rhode Island Infrastructure Bank</td>
<td>• Renewables</td>
<td>• Commercial &amp; Residential PACE Program</td>
<td>• RGGI • ARRA • Ratepayers • QECBs • Bonding authority</td>
<td>~$7 M</td>
<td>• Independent quasi-public</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>• Efficiency</td>
<td>• Efficient Buildings Fund for muni’s</td>
<td></td>
<td></td>
<td>• Board of Directors, appt by Governor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Grid and demand-side upgrades</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Montgomery County Green Bank</td>
<td>• Renewables</td>
<td>• TBD</td>
<td>• Settlement from utility merger negotiation</td>
<td>$20 M (TBD)</td>
<td>• Independent non-profit</td>
<td>TBD</td>
</tr>
<tr>
<td></td>
<td>• Energy efficiency</td>
<td></td>
<td></td>
<td></td>
<td>• Board of Directors, partial Council approval</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Grid and demand-side upgrades</td>
<td></td>
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</table>
CGC supports governments in multiple ways to conceive of concept, design institution & implement

<table>
<thead>
<tr>
<th><strong>Connecticut Green Bank</strong> – Concept Development &amp; Implementation</th>
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</thead>
<tbody>
<tr>
<td>• CGC worked with government to develop concept, gain buy-in, draft legislation</td>
</tr>
<tr>
<td>• Serve on Board, design products, provide strategic guidance, share best practices</td>
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</table>

<table>
<thead>
<tr>
<th><strong>New York Green Bank</strong> – Business Plan Development</th>
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</thead>
<tbody>
<tr>
<td>• Drafted NYGB Business Plan after Governor announced plan to create Green Bank</td>
</tr>
<tr>
<td>• Built financial model and made business case to regulator to fund the Green Bank</td>
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<thead>
<tr>
<th><strong>Washington, D.C.</strong> – Green Bank Viability Report</th>
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<tbody>
<tr>
<td>• Completed formal study for D.C. government to explore need for Green Bank</td>
</tr>
<tr>
<td>• Identify finance opportunities and appropriate model, to be implemented this fall</td>
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</tbody>
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<tr>
<th><strong>Nevada</strong> – Legislatively Directed Green Bank Assessment</th>
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<tbody>
<tr>
<td>• Policymakers looking for non-partisan solutions to lower energy cost, grow economy</td>
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<tr>
<td>• Completed study of opportunity and outlined implementation plan</td>
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</table>
Potential Roadmap for Green Bank Creation

1. Complete Study to Determine Green Bank Objective, Products, Structure
2. Develop Green Bank Implementation Plan
3. Stand-Up & Operationalize Green Bank
Study like those completed with other governments can identify right GB model & solutions

**Hypothetical Scope of Work for Green Bank Study**

- Task 1 – Review Current Market & Existing Policies
- Task 2 – Summary of Existing Green Banks
- Task 3 – Stakeholder Interviews & Engagement
- Task 4 – Identify Finance & Market Gaps
- Task 5 – Summarize Green Bank Need
- Task 6 – Recommended Institutional Model & Products
- Task 7 – Green Bank Impact Analysis
- Task 8 – Implementation Guidance