

GREEN BANK PRODUCT AND ACTIVITY OVERVIEW

COALITION FOR GREEN CAPITAL

State and local governments are increasingly interested in creating clean energy financing institutions that use limited public resources to leverage greater private investment in clean energy. These institutions, generally known as Green Banks, use a range of techniques to increase the availability of financing for the deployment of renewable energy and energy efficiency technology. Across different jurisdictions, Green Banks operate by a common set of principles that include: (1) offering financing, rather than grants; (2) seeking to stimulate private investment alongside public investment; and (3) revolving and recycling public dollars so as to maximize both private investment and efficiency of each public dollar invested in the Green Bank.

To date, official state Green Banks and similar entities have been created in Connecticut (2011), New York (2013), Hawaii (2014), California (2014) and Rhode Island (2015). Also, Montgomery County (2015) created the first official county Green Bank. Though these banks all have different structures, funding sources, and market approaches, they all operated on the same Green Bank principles laid out above. This note will describe the common financing techniques and principles, and highlight some specific products/techniques used by existing Green Banks.

Green Bank Financing Techniques & Structures

Green Banks generally use a common set of techniques and structures to offer public financing and leverage private investment in clean energy. These methods form the basis of many specific Green Bank activities and applications, and are adaptable to fit multiple markets segments and technologies.

Financing Techniques – The following techniques form the three fundamental categories of forms of Green Bank financing activity. All Green Banks are using some derivation of these fundamental categories.

Credit Enhancement

A credit enhancement is a tool offered by a Green Bank with the goal of increasing private lending activity and/or improving the terms of private financing. Green Banks accomplish this through multiple means, but loan loss reserves and loan guarantees are most common. This technique is suitable for a market where private lenders are interested in entering the market but are hesitant due to perceived risks. Or, a credit enhancement can be used when private lending is available, but at terms and rates that reduce the economic viability and market potential for clean energy projects. These kinds of investments can achieve high leverage ratios, stimulating many dollars of private investment per public dollar of investment.

Co-Investment

Co-investment involves direct Green Bank investment in a clean energy project alongside a private investor. Unlike credit enhancements, where public dollars are not actually invested in the project technology, co-investment can take multiple forms and structures of actual project investment. A Green Bank may provide senior debt, subordinated debt, or equity in a project, which is then paired with multiple potential forms of private investment. For instance, a Green Bank and private bank may each make a 50% debt investment in a project. Or, a private investor may offer 80% of the debt needed for a project, and the Green Bank makes a 20% subordinated debt investment. This structure both fills a financing gaps *and* acts as a credit enhancement for the senior debt. The leverage achieved on these co-investments depends the precise product structure, and by its nature requires the presence of a private lender willing to at least make some level of investment in a project.

Warehousing/Securitization

In the event no private lender is willing to underwrite loans, even with a credit enhancement, it may be suitable for a Green Bank to underwrite 100% of a loan itself. This situation may arise if the technology itself is perceived as too risky or new, if the market segment is viewed as having more credit, or if the investments themselves are not cost-effective to underwrite. This final challenge is a significant barrier to private investment in small and geographically disperse projects like residential or small business energy efficiency projects. By their nature the projects are relatively low cost and may differ in terms of credit, technology and location. This makes the projects relatively expensive to underwrite for a bank and not worth the trouble. However, if a pool of these kinds of loans were bundled together to diversify risk and achieve scale, the projects then become far more attractive to lenders. A Green Bank can accomplish this by underwriting loans directly and warehousing them until scale is reached. At this point the Green Bank can sell the loans to private investors. This can be done either through a private placement of the whole loans, a private securitization, or a public securitization. If the Green Bank is able to sell its entire stake in the portfolio of loans, then 100% of public dollars are replaced with private capital, effectively achieving infinite leverage. This technique is critical to allowing small clean energy projects to access the low-cost capital that can be found in publicly traded debt markets that are tapped through securitization.

Financing Structures – Green Banks can use the described financing techniques through a number of structures that the clean energy financing industry has developed as new delivery mechanisms. These delivery mechanisms were created to increase the security for a lender that otherwise would be making an unsecured loan with a perceived risk of repayment. These structures can be used with or without the involvement of a Green Bank, but it has been found that Green Banks are a suitable manager and implementer of these structures.

Property Assessed Clean Energy (PACE) Financing

PACE Financing is a structure through which a building owner repays an energy upgrade loan through property taxes via a new lien on the building. PACE liens typically sit senior to all other non-tax liens on a building, including the mortgage, significantly reducing repayment risk. In any state that has passed

legislation and any municipality that then allows PACE, technically a PACE loan can be made by any lender. The lender would provide a loan to a building owner to implement energy efficiency, for instance, and then the tax-collecting agency would place a new lien on the building equal to the loan repayment. That repayment is collected by the taxing agency and remitted to the lender. Though simple in concept this is difficult to execute and has struggled to attract private lenders in many states. However, Connecticut has found that the Green Bank is an ideal PACE program administrator *and* lender. A Green Bank could also offer a credit enhancement to entire private lenders into the PACE market. Many states that have relied entirely on private lender origination and underwriting have failed to create active PACE markets. Green Banks present a successful solution.

On-Bill Financing/Repayment

On-bill financing or repayment is a structure through which an energy upgrade loan is repaid through the customer's utility bill. Similar to PACE, this structure creates greater security for the lender because historically utility bills have a very high rate of repayment. On-bill financing has additional benefits, too, because it addresses the split incentive between building owners and tenants. By attaching a loan to a utility meter, rather than the customer, a tenant can reap the benefits of efficiency, repay only the portion of the loan that is due while still a tenant, and then hand the remaining payments to the next tenant who continues to benefit from the efficiency. This has the power to open up many new markets for efficiency financing that otherwise would be unsuitable. Like PACE, a Green Bank could act as a program administrator and/or a lender for on-bill programs. (Note: On-bill financing typically refers to programs where the utility itself uses its own capital to issue the loans. On-bill repayment refers to the programs that allow non-utility lenders to issue loans, where the utility merely acts as a collection platform.

Example Green Bank Products & Activities

Connecticut Green Bank – The Connecticut Green Bank effectively acts as a retail lender, working closely with end borrowers to either directly lend or enable direct lending for renewable energy and energy efficiency projects. It offers four primary products, two of which are being transitioned to private lenders.

Smart-E Loan – Residential Energy Upgrades

The Connecticut Green Bank provides a standard-offer loan loss reserve fund to enable local banks to make “Smart-E Loans” to residential customers to perform building upgrades. Rather than make loans directly to homeowners, the Green Bank seeks to spur greater activity and market understanding about retail lenders in Connecticut. To move these banks into the building energy upgrade market or entice those banks to offer more favorable terms, the Green Bank set up a loan loss reserve credit enhancement to cover a portion of potential losses a bank may have on those energy loans. This is technically a second loss reserve, where the bank bears the first dollar of loss, and the Green Bank takes a portion of losses after that (but not 100% of losses). In exchange for receiving the benefit of this credit enhancement, the participating banks agree to offer loans at extended terms with “not-to-exceed” rates that ensure



borrowers can be cash flow positive on their energy projects. This has been found to be an essential component of project viability, and is only possible with long terms and reasonable interest rates. This form of credit enhancement is more efficient than an interest rate buy down or a full guarantee. An interest rate buy down is effectively a grant, as the Green Bank would have to make permanent cash payments to the banks to reduce their rates. Under the loan loss reserve, the Green Bank must only set aside cash that is drawn from only in the event of a loss. If there is no loss, then public dollars are preserved and can be used for other lending activity. And the reserve is more efficient than a guarantee because fewer dollars must be set aside to support the reserve than the guarantee. To date the product has been adopted and used by dozens of banks, many of which have partnerships with contractors that originate deals for the banks. And losses, with the resulting draw down from the Green Bank's reserve fund, have been minimal.

CT Solar Lease II – Residential PV Solar Lease Product

The Connecticut Green Bank created the first state-sponsored solar lease fund in the country when it began offering the CT Solar Lease in 2008 through its predecessor agency. This product found initial success and was built again at greater scale in 2013 after the Green Bank was created. The purpose of this product was to provide local installers a financing product they could offer customers who could not buy a solar system with cash out of pocket, and didn't want to own the panels themselves (as with a loan). As major national third-party owners (like SolarCity) began offering solar leases and PPAs, local installers in Connecticut that were too small to build their own financing products were left unable to serve the growing customer base in the state.

The Green Bank built a sophisticated tax equity-based lease fund to serve this specific market. The Green Bank formed a new special purpose vehicle (SPV) that would technically own the solar systems on homeowners' roofs. The Green Bank made both an equity and subordinated debt investment in the SPV. A syndicate of banks, led by First Niagara, made senior debt investments, and US Bank was the tax-equity provider that would receive the federal tax benefits provided to solar investors. The Green Bank also provided a loan loss reserve credit enhancements using leftover federal ARRA funds to support the senior debt investors. The solar lease was offered with panel insurance and a warranty, removing any burden from system management from the customer who only had to make monthly payments for the use of the panels. This product has been a huge success and funds have almost been entirely expended. This product also created a strong base of political support for the Green Bank among the local installers who could not have survived without being able to offer financing to customers.

CT Solar Loan – Residential PV Solar Loan Product

When the Connecticut Green Bank was formed in 2011 no solar loan option was available in the state. If a homeowner wanted to own the panels on their roof, but didn't have \$25,000 in cash on-hand, that consumer had no way to adopt solar. To address this the Connecticut Green Bank launched the CT Solar Loan product, using \$5 million in public dollars to finance loans through its private origination partner, Sungate. The Green Bank then took two steps to draw in private capital. First, the Green Bank found a

private investor, the crowd-sourcing platform Mosaic, to purchase 80% of the loan portfolio, immediately replacing public capital with private dollars.¹ Second, after showing market potential, Sungage raised a private financing warehouse from Digital Federal Credit Union, who provided \$100 million for Sungage to originate far more solar loans across many more states.² The Connecticut Green Bank pulled back its own capital, and allowed the private market to take over at greater scale.

Commercial PACE – Commercial, Industrial & Multifamily Building Upgrades

Through Commercial PACE, CT offers whole-building commercial energy retrofits. The whole-building approach to energy upgrades has long been viewed as the most effective way to significantly curtail energy consumption, but the projects are hard to execute and finance. They include multiple energy efficiency technologies and can also include roof-top solar when appropriate.³ The Connecticut Green Bank is able to finance these projects through its Commercial Property Assessed Clean Energy, or C-PACE, program. PACE is a structure that allows a borrower to pay back a clean energy loan directly through their building's property taxes. This makes payback easier for the customer and increases security for the lender, thus enabling more and lower-cost lending.

PACE is legally authorized in over 30 states, but Connecticut is one of only a two states to achieve significant scale with the program. Unlike in most states where each local government is charged with creating their own program, the Connecticut Green Bank is tasked with administering the program across the entire state. Through central administration the Green Bank implements programmatic consistency and standardization, critical elements for private investment. And the Green Bank also ensures that every loan offered can be paid back entirely through the savings generated by the project, as stipulated in the state's legislation. The Green Bank uses a standardized and rigorous technical underwriting method to ensure that every project has a savings-to-investment ratio ("SIR") greater than 1.

PACE programs all over the country have stagnated and failed to attract private capital because of program complexity and small investment scale. But the Connecticut Green Bank was able to kick-start the market by originating and underwriting PACE loans itself using public dollars and build scale by aggregating projects. Loans are offered at approximately 6%, which is low enough to expand the addressable market and make projects cash flow positive, but high enough to attract private investors who want to buy the loans from the Green Bank. After building a portfolio large enough to attract private investment, the Green Bank sold 80% of the PACE loan portfolio through an auction, drawing in \$24 millions of private investment.⁴ This was the first commercial efficiency securitization in the country, attracting specialized and institutional investors to participate in the market. Without Green Bank investment and coordination, the market would have remained dormant as it has in many other states.

¹ Trabish, Herman K., "Will Crowdsourced Loans for Rooftop Solar Overtake Third-Party Ownership?" Greentech Media, February 19, 2014.

² Reporter's Notebook, "Green Bank partner lands \$100M solar investment," Hartford Business Journal, November 10, 2014.

³ To date, roughly 50% of projects are PV only, 25% are EE only, and 25% are both PV and EE.

⁴ Lombardi, Nick, "In a 'Watershed' Deal, Securitization Comes to Commercial Efficiency," Greentech Media, May 19, 2014

Now that the Green Bank has demonstrated the mechanics and potential of PACE, private investors are preparing to enter the market at far greater scale. To satisfy the growing pipeline of projects, the Green Bank is raising an external warehouse of at least \$50 million in private capital that will be used to originate loans. Those private dollars will be paired with public debt and/or credit enhancements, and the loans will then be securitized in public markets. After only one portfolio sale, the Green Bank has demonstrated market opportunity to draw institutional investors eager to originate the loans, reducing the need for public investment. Recent securitizations of residential PACE loans in California suggest that this new private capital will come with ever lower interest rates.⁵

Residential Solar Investment Program – Converting Grants to REC Financing

As part of its founding legislation, the Green Bank was tasked with managing and winding down the previously-existing residential solar rebate program, called the Residential Solar Investment Program (RSIP). RSIP is a grant offered in two forms – an upfront payment for host-owned systems, and a 6 year performance based incentive for third-party owned systems. This grant was intended to reduce the effective cost of electricity from the solar systems and make solar more attractive. By design, though, the RSIP was meant to be stepped down, reducing the amount of benefit as the cost of solar fell and the availability of financing increased. Through this transition, the state support for solar would move from an expense to an asset, eliminating permanent expenditure of public dollars.

The Green Bank team carefully managed the step down of the RSIP, pegging reductions to the achievement of market goals of installed capacity. The RSIP was designed to generate 30 MW of installed capacity in 10 years. However, the increased availability of financing for solar from the Green Bank allowed the 30 MW target to be reached in just 3 years while reducing the RSIP level by more than half.

Also built into the enabling legislation was the programmatic rule that any homeowner receiving the RSIP must automatically transfer ownership of their Renewable Energy Credits (RECs) to the Green Bank. The Green Bank in turn was free to manage and sell the REC portfolio as desired, which would in effect recoup a portion of the RSIP cost. Though not initially viewed as such, the Green Bank realized they were effectively offering a REC financing program for residential customers, where the upfront grant acted as lump-sum payment for the future stream of RECs from customers. If the Green Bank assumed an implicit 15-year contract term, it could calculate the effective REC price that Green Bank was paying to the customer through the RSIP grant. While the initial RSIP grant level produced an effective REC price far higher than the REC market would offer, the Green Bank quickly realized that as RSIP declined, the effective REC price was actually below the market price. This meant the Green Bank was stimulating solar development at far lower cost to the ratepayers than the REC procurement methods used by the utilities, who set the market price.

⁵ Roselund, Christian, “Renovate America and 400 Capital complete \$129 million PACE securitization,” PV Magazine, November 20, 2014.



Through this analysis, the Green Bank conceived of a new program through which the utilities would sign 15-year REC purchase contracts with the Green Bank at a REC price *below* what they would otherwise pay on the market. This new program generates numerous benefits. It saves dollars for ratepayers as utilities are able to acquire RECs at a lower price, and therefore pass on less cost to customers. It creates more market certainty for the Green Bank, which does not have to sell its REC on the spot market. And it means that the RSIP program, once viewed as a grant, was now a self-sustaining REC financing program that entirely paid for itself and had no permanent cost. This innovative and entirely unique structure was formalized and approved through new legislation in summer 2015, and is now known as the Solar Home Renewable Energy Credit program, or SHREC. This sets a blueprint showing any state how it can stimulate solar market growth by increasing the availability of financing, reducing grant levels and eliminating permanent expenditure of public dollars.

New York Green Bank – The New York Green Bank (NYGB) was created in December 2013 with the approval of funding by the Public Service Commission. It opened for business in February 2014 with the release of its open-ended RFP, seeking proposals for funding. Unlike the Connecticut Green Bank which offers specific retail products, the NYBG operates more like a wholesale infrastructure bank, working with lenders and developers who will then originate deals and offer retail financing. An ideal application to the NYGB will come from a private lender and developer together, who have a specific project that is only partially financed and needs the NYGB to fill the financing gap. The NYGB has no prescribed financing structures. However it will offer capital in the forms and structures outlined above, including loan loss reserves, guarantees, senior debt, subordinated debt, insurance, warehousing and securitization. The NYGB reviews and scores applications as they are received, and will only fund deals that (1) have the ability to scale, (2) can prove that private financing is unavailable for the entire project, and (3) can serve to transform clean energy capital markets. In the fall of 2014 the NYGB announced its first set of tentative projects, which will use \$200 million in public capital to leverage \$600 million in private capital.

Hawaii Green Infrastructure Authority – In 2014 Hawaii created a new Green Infrastructure Authority to manage clean energy financing programs. This first of these programs is called the Green Energy Market Securitization (GEMS) program, which will provide rooftop solar lease financing. GEMS uses a unique capitalization structure and is focused on narrow market segments, specifically the low-to-moderate income (LMI) market. Hawaii has the highest electricity prices in the country, making solar relatively cheap compared to the grid. This also means that increasing the availability of solar is a critical solar welfare issue in Hawaii. The advent of solar financing mechanisms like solar leasing enabled a huge portion of Hawaii homeowners to put solar on their roofs, with total market penetration above 10%. However, there was a huge difference in market adoption between high and low income households, as traditional solar leasing products were unavailable to low income and/or low credit households. The GEMS program was built to serve this specific market.

The GEMS fund was capitalized using a “rate-reduction bond”, whereby an existing system benefit charge on ratepayer bills was used to secure a 15-year \$150 million bond that received the highest possible credit rating. This bond fund is now combined with private tax-equity capital to provide leases, which will be paid back through on-bill repayment. These lease repayments will be collected by the GIA and the revolved for new leases. The bonds will be repaid separately by the system benefit charge. The combination of the low-interest rate on the bond and the on-bill repayment mechanism creates a high level of repayment security, enabling low lease prices and relaxed credit standards. GEMS has recently rolled out its first lease product focused on the non-profit sector, and will soon launch its LMI residential solar lease product.

For further guidance on these topics or answers to questions, please reach out to Jeffrey Schub, Executive Director of Coalition for Green Capital, at jeff@coalitionforgreencapital.com.