

APRIL 2020

Conceptualizing a Toronto Green Bank

MUNK SCHOOL OF GLOBAL AFFAIRS & PUBLIC POLICY

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Executive Summary

TransformTO is Toronto's climate action strategy, under which the City supports efforts to retrofit buildings through loan programs and local improvement charge financing. These programs, however, are facing operational and governance barriers related to City debt levels, risk acceptability, and project criteria (see **section 1**). The result: a limited amount of long-term debt finance available for climate change projects and an insufficient flow of capital to achieve the necessary rate of retrofitting in the existing buildings sector. As the need to accelerate the pace of retrofitting increases, the City is interested in understanding opportunities that exist to resolve the constraints and barriers to improve and scale current efforts.

This report considers the outlined challenges and the need to scale solutions and finds that capital leveraging through an official municipal green bank is an opportunity that the City should consider. Green banks have been used by governments to finance climate change mitigation projects globally, including in municipalities in the United States and the United Kingdom, as outlined in **section 2**. Despite these apparent successes, a similar effort has yet to be conducted by the City of Toronto.

Through case study analysis of other relevant precedents (London's Mayor's Energy Efficiency Fund, the Connecticut's Green Bank, the New York Green Bank, and the Montgomery County Green Bank), **section 3** of the report finds that green banks are able to scale solutions by leveraging additional private capital at ratios as high as 8:1, and on average at ratios of 4:1. **Section 4** compiles the practices of each of the four analyzed cases to outline nine design elements that define the essence of a successful green bank. The elements discussed include bank creation, types of partnerships, funding sources, types of financial products, market development, selection of projects and objectives, governance, measurement and verification, and sustainability. Each category contains options and recommendations for Toronto to consider when designing and constructing their own green bank.

Section 5 of the report identifies key stakeholders, outlines their impact and influence on a green bank project in Toronto, and recommends next steps for stakeholder engagement. Six primary stakeholder groups are identified: channel partners, real estate providers (e.g. building owners), capital providers, government actors, non-governmental organizations, and tenants. These stakeholder groups would make up the focus of the programs, products, and services of a Toronto green bank. Large and small banks, and the municipal, provincial, and federal governments, are found to have

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the highest impact and influence on a potential Toronto green bank. It is recommended that stakeholders are engaged through an advisory committee based on the City's networks. A survey is presented that should be piloted to determine market demand and stakeholder needs.

The report concludes that setting up a municipal green bank in Toronto will better position the City to overcome the governance and operational challenges that the City currently faces, while allowing it to scale solutions to get closer to investing the required capital to meet 2050 net zero targets.



Section 1: Introduction

CURRENT EMISSION LANDSCAPE

In 2017, the most recent annual dataset in this report, Canada ranked as the eighth largest greenhouse gas emitter in the world, with 547.8MT of annual CO₂ emissions. Despite the nation's recent efforts to reduce their carbon footprint, Canada still represented 2% of global emissions and ranked fourth for emissions per capita.¹ Buildings specifically produced an annual CO₂ equivalent of 85MT, equating to 12% of Canada's total emissions. On the provincial level, historically, Alberta and Ontario have been the nation's largest emitters. However, Ontario's climate action efforts, including the decision to close coal-fired electricity generation plants, have resulted in a steady decline of emissions by a total of 22% since 2005. Of the major contributors, the buildings sector made up 21% of Ontario's 179MT of greenhouse gas emissions.² Within Ontario, the Greater Toronto Horseshoe Area emitted 49.2MT of carbon emissions, equalling 41% of the provincial total. Of this region's emissions, at 31%, Toronto contributed the largest portion.³

In Toronto, greenhouse gas emissions by sector are broken down by buildings, transportation, and waste, as seen in Figure 1a below. Toronto's emissions are significantly dominated by the buildings sector, within which, 51% of emissions are derived by residential buildings, 36% by commercial and institutional buildings, and 13% by industrial sources. The greenhouse gas emissions from these buildings comes predominantly from natural gas and electricity, as seen in Figure 1c.

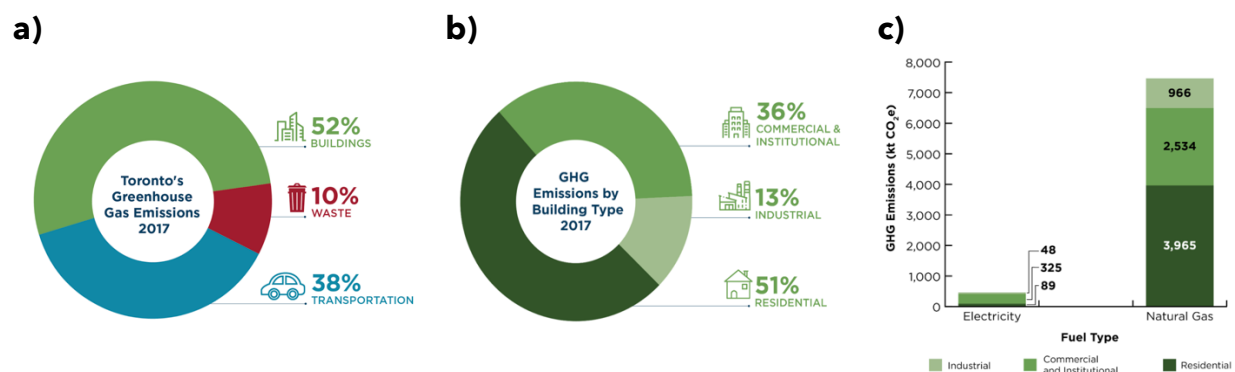


Figure 1. Breakdown of greenhouse gas emissions in the City of Toronto by **a)** sectors, **b)** building type, and **c)** fuel type used in each building type adopted from TransformTO.

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TRANSFORMTO

TransformTO is Toronto's ambitious climate action strategy that outlines long-term, low-carbon goals aimed to reduce local greenhouse gas emissions and encourage prosperous, equitable, and healthy communities. When approved in 2017, TransformTO set emission reduction targets of 30% by 2020, 65% by 2030, and net zero by 2050, against 1990 levels.⁴ To meet these targets, the City provided a detailed pathway to achieve significant emission reductions in four strategic directions - homes and buildings, energy, transportation, and waste - representing Toronto's major pollutant sources. The implementation of TransformTO in relation to these categories has resulted in the development of strategies for designing near-zero emissions development, programs to support energy retrofits of existing buildings, actions leading to low-carbon transportation choices, and plans to reduce residential waste.⁵ Figure 2 outlines the long-term goals of TransformTO in relation to the four strategic categories of homes and buildings, energy, transportation, and waste.

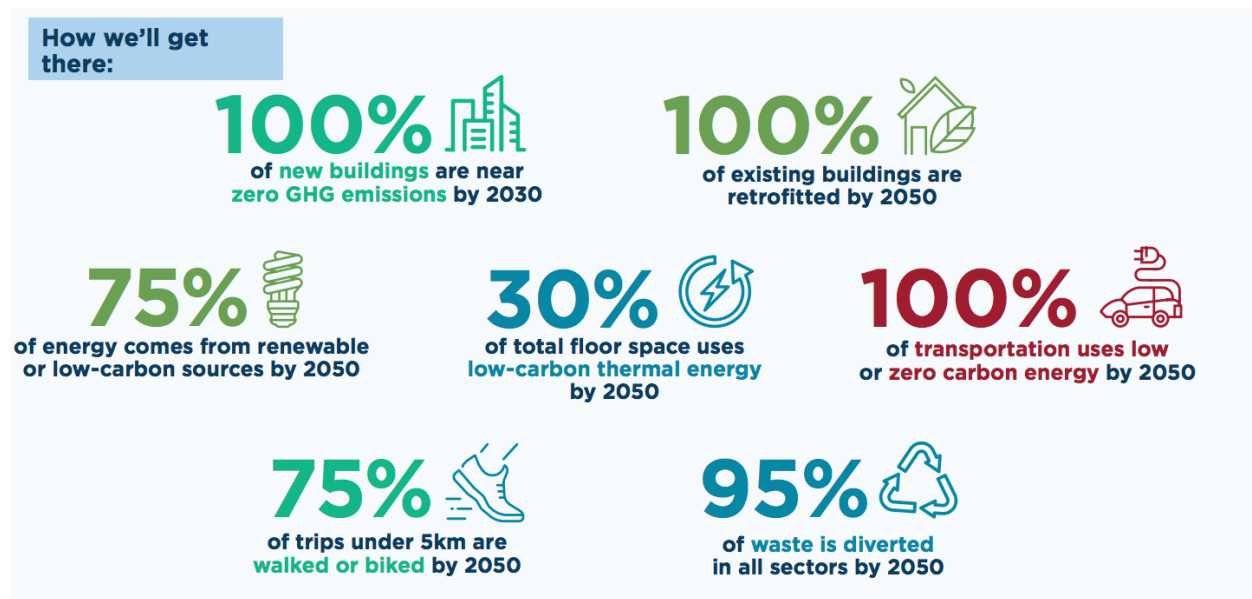


Figure 2. Long-term goals under TransformTO's greenhouse gas emission targets.

BUILDING RETROFITS AS A PART OF TRANSFORMTO

TransformTO's strategy of retrofitting 100% of existing buildings to the highest technologically feasible emission reduction by 2050 is a vital pillar in achieving the long-term community-wide low-carbon goal. The energy efficiency improvements in

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building have the potential to remove 3.9MT of Toronto's 8.7MT reduction goal of greenhouse gas emissions.⁶

In order to fund such projects and incentivise the necessary progress on climate action, the City of Toronto employs various financial mechanisms. Through the Better Buildings Partnership (BBP), Toronto provides funding, expertise, and support to improve the energy efficiency of the City's residential, commercial, industrial, and institutional buildings. The Home Energy Loan Program (HELP) and the High-Rise Retrofit Improvement Support Program (Hi-RIS) are two programs which provide loans for residential energy retrofits through local improvement charge (LIC) financing. In such programs, home or building owners easily pay back loans through their monthly installments on property tax bills. With access to low fixed interest rates and terms up to 20 years, owners are provided the possibility to pay for energy improvements over longer periods of time and more opportunities are created for residents and industries to take on improvement projects.⁷

Through the HELP program, Toronto homeowners can use loans of up to USD 75,000 to cover the cost of home energy improvements such as geothermal systems, high-efficiency furnaces, tankless water heaters, rooftop solar PV panels, and electric vehicle charging stations, among others.⁸ The Hi-RIS program offers financing to residential apartment buildings on energy and water improvements to the building envelope, mechanical systems, water fixtures, lighting, and renewable energy mechanisms.⁹

Beginning last year, Toronto additionally offered low-interest loans to all non-residential building owners who seek to improve their energy efficiency through their Energy Retrofit Loan program. To help reach TransformTO's goals, the City provides financing for up to 100% of costs for projects including lighting retrofits, HVAC systems, building envelope improvements, renewable energy projects, and energy storage.¹⁰

Overall, these programs reflect the City's efforts to reach the ambitious goals set forth by TransformTO. These programs, however, are facing an insufficient flow of capital to achieve the necessary rate of retrofitting due to operational and governance barriers. These challenges will be discussed further in the following section.

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BARRIERS, GAPS, AND CHALLENGES

The City has outlined plans for both “Business as Planned” and “Low Carbon Scenarios.”¹¹ The Business as Planned scenario estimates reduction in emissions at the current level of actions undertaken at the municipal, provincial, and federal governments while the Low Carbon Scenario dwells into additional actions that will be needed to achieve net zero by 2050. The Low Carbon Scenario demands for a tremendous shift in the existing market structures.

Currently, natural gas is cheaper than electricity, making it a favorable choice for all. To help offset the cost to transform to energy efficient building models, the Ontario government announced a USD 325 million Green Investment Fund in November 2015.¹² This fund was designed to help households and businesses “install energy-efficient equipment, including windows and furnaces.” It was to be used as a down-payment on the province’s cap and trade revenue and the City intended to supplement these plans to reach the TransformTO targets. However, the cancellation of this program in 2018,¹³ shifted the burden of retrofit financing entirely on the City for City projects, increasing their challenges.¹⁴

On top of the challenges related to program cancellation, the City faces governance and operational challenges related to their current financial programs for retrofits in the existing buildings sector. These challenges are explained below:

Governance Challenges

The current loan programs offered by the City have an energy cost savings business case requirement, where energy cost savings must allow for payback within 20 years. This criterion is in place because of the limited risk acceptability for the City.¹⁵ However, most carbon saving building retrofits do not pay back as typical green building investments do not generate energy savings, and instead are based on the triple bottom line, ESG, CSR and carbon reductions.¹⁶ This has led to the City having to decline projects that do not align with the cost savings parameters, limiting the ability of retrofits to occur at the scale needed to reach TransformTO goals.

In addition to the business case requirement, there is no dedicated funding pool available for retrofitting projects in the City. This means that yearly funding depends on city council’s approvals based on the budget cycle.¹⁷ This limits the City in executing funding on an as-needed basis.

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Operational Challenges

The City's existing loan programs' financing all runs through the City. As the funding amount increases, as per the needs of TransformTO, any defaults (or requests for delay) can potentially cause a crisis for the City. In addition, all loans are unsecured, adding additional layers of risk. This loan program uses the City's own funds and is not enough to cover the required costs to achieve TransformTO targets.¹⁸ This combined with the lack of incentives at the provincial level, makes it extremely difficult for channel partners to undertake this investment, creating a gap between climate savings and economic saving. As a result, there is a need to explore additional financing options for building retrofits.

FINANCIAL GAPS

Given the required reductions in CO₂e to reach TransformTO's low carbon scenario targets, and cost of per tonne reduction, the required financing could be as high as CAD 1.3 billion a year.

Table 1. Estimated yearly financing required to meet desired emission reductions under TransformTO.

Emission Reduction Required (LCS)	3126 KT CO ₂ e
Est. Cost per Tonne (\$)	270-425
Est. Financing/Year (\$)	0.84B-1.34B
Current Financial Status	< CAD 250M/Year
Estimated Financial Gap	~ CAD 840M/Year
Desired Leverage Ratio	3.36:1

In Table 1, we can see that the total emissions reduction required to meet the TransformTO targets is 3126 KT CO₂e.¹⁹ The Ontario Action Plan report estimates the cost of reducing per tonne emissions depending on the building type to be between CAD 270 and CAD 425, bringing the total cost per year at approximately CAD 1 billion.²⁰ Given the current governance and operational challenges, the City is only able to raise approximately CAD 250 million a year for building retrofits.²¹ Hence, there is a need for the City to explore additional ways to fill this financing gap.

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Section 2: Green Banks

In light of Toronto's current financial and political status, one potential opportunity to overcome barriers and meet the goals of TransformTO is capital leveraging through an official green bank. Green banks are a financing model increasingly being used by Governments to catalyze private investment for clean energy and infrastructure projects. Similar finance entities have been used across several nations, states, and municipalities.

WHAT IS A GREEN BANK?

A green bank is a public, quasi-public or non-profit entity that reduces barriers to investment and supports that capital flows into market gaps, including into low-carbon and climate-resilient infrastructure, by reducing the risks for private lenders.²² The entities are generally capitalized with public funds, which are used to offer financing mechanisms, such as loans, co-investment opportunities, and credit enhancement, to crowd-in private capital to fill financing gaps (see Figure 3).²³ More scaled green banks can also issue green bonds, which can be used to recycle capital. Along with the security of a government partnership, these innovative financing mechanisms reduce real and perceived risk to the private sector, leveraging greater investment. This means that green banks increase the efficiency of the public dollar by enabling transactions that accelerate the ability of the government to meet public policy objectives.

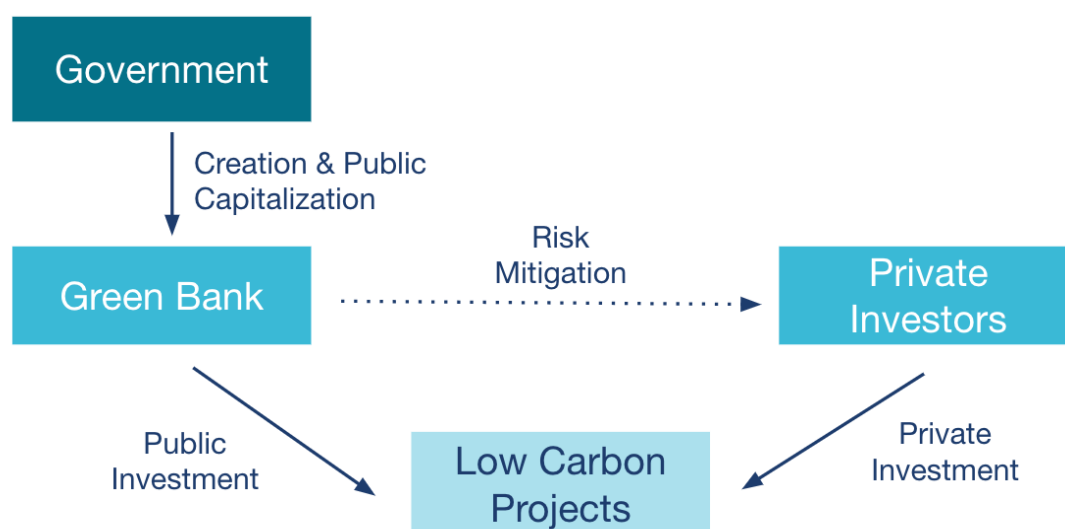


Figure 3. Generalized Structure of a green bank.

Section 2: Green Banks

Green banks can be tailored to meet the needs of the unique national and local contexts. They can have diverse goals and mandates, such as meeting emissions targets, mobilizing private capital, lowering the cost of capital, lowering energy costs, developing green technology markets, supporting community development, and creating jobs.²⁴

Green banks align with the guiding principles of climate action for TransformTO: equity, health, resilience, and economic prosperity.²⁵ Green banks can advance social equity and improve affordability for vulnerable populations by focusing funds on gaps in the market where the private sector has not yet offered a viable solution - especially to underserved low-to-moderate income communities. While a government could theoretically focus funds in these areas without a green bank, there are not enough public dollars to meet the needed aggressive climate goals. Green bank's private-public investment model solves this problem by using limited public dollars to attract multiples of private investment into the market gaps. Additionally, investments in energy saving infrastructure and technology can reduce energy bills for those in need.

Green banks also contribute to enhancing and strengthening the local economy, maintaining, and creating good quality local jobs, and reducing poverty. Green banks eliminate the upfront cost of clean energy and infrastructure project adoption, a primary barrier to market growth. They also contribute to macroeconomic development by increasing investment and narrowing the savings-to-investment gap. Finally, green banks generate economic impact through job creation, especially in areas which have unrealized potential in renewable energy and energy efficiency. For example, since the inception of the Connecticut Green Bank, employment in the solar industry grew by 30%.²⁶

Green banks can also overcome the operational and governance challenges specific to Toronto that were outlined in the previous section of the report. Green banks use third-party financing which would allow the City to preserve its debt levels and lower the risks of loan defaults causing a crisis for the City. Additionally, green banks decrease the reliance on the budget cycle approvals from city council. Green banks will also allow for the removal of the set of City developed criteria for loaning based on a cost saving business case. These criteria can be replaced with green bank criteria to determine whether or not the project is eligible for financing. A green bank could

Section 2: Green Banks

accept additional risk factors and could, for example, approve projects based on their environmental gains, or increased abilities to raise rents, or reduced carbon emissions.

GEOGRAPHICAL SPREAD AND GREEN BANK BACKGROUND

The past decade has been a pivotal period for the pioneering and development of Green Banks across the globe. In 2018, the Intergovernmental Panel on Climate Change's (IPCC's) Fall Report found that, to meet the goal of limiting global warming to less than 1.5 degrees Celsius, investments in low-carbon energy technology and energy efficiency will need to increase by a factor of five by 2050, compared with 2015 levels.²⁷ To meet this goal, an unprecedented mobilization and redirection of domestic and international capital is required. Specifically, each unit of public or donor money will have to be used to mobilize multiples of private capital. Green banks are one type of institution that is well equipped to accelerate this process.

Currently, there are twelve green banks in operation across seven countries. In the United States and the United Kingdom, green banks have been created at the state and local levels, whereas in all other countries, green banks have been created at the national level.²⁸ Members of the Green Bank Network (Clean Energy Finance Corporation, Connecticut Green Bank, Energy Efficiency and Renewable Sources Fund, Green Finance Organization, Green Investment Group, Malaysia Green Technology Corporation, New York Green Bank, Rhode Island Infrastructure Bank, and Tata Cleantech Capital Limited) have committed approximately USD 14.9 billion for projects that are expected to mobilize USD 50 billion in public and private capital for green infrastructure projects around the globe, surpassing their goal of USD 40 billion by 2019.²⁹ Those banks who are not members of the Green Bank Network (Montgomery County, California CLEEN Center, Hawaii Green Infrastructure Authority) have mobilized USD 93.5 million.³⁰ Green banks are investing across the technology spectrum, including wind, utility and small-scale solar, energy efficiency, low-carbon transport, combined heat and power, anaerobic digesters, LED street lighting, geothermal and energy storage. They are also financing with a variety of products, at all scales, including multibillion-dollar offshore wind farms, energy-efficient property and vehicles, and solar for small and medium-sized enterprises as well as residential properties.³¹ Green banks use innovative financing techniques and market development tools, as will be discussed in section 4 of this report, in partnership with the private sector, to accelerate the distribution of clean energy technologies.

Section 2: Green Banks

PROGRAMS TO SUPPORT CLEAN ENERGY DEPLOYMENT IN CANADA

Canada has a history of making commitments to embracing the transition to clean energy, demonstrated through their pledge under the Paris Agreement on Climate Change to aggressively reduce their greenhouse gas emissions and the Pan-Canadian Framework on Clean Growth and Climate Change.³² The support the nation provides to clean energy technology and business development has resulted in several mission-driven entities related to the federal government that offer project financing. These entities have proven to support the growth of cleantech in Canada and have been successful at accomplishing their specific goals, however none of the entities are aligned or capable of operating as a domestic project finance agency.³³

One such entity is Sustainable Development Technology Canada (SDTC). SDTC is an organisation created by the Government of Canada to develop, demonstrate, and distribute clean technology solutions and projects through grants.³⁴ Their mission is to support the Canadian cleantech ecosystem through development and deployment of environmentally friendly technologies. However, SDTC does not function as a bank as it solely distributes budgetary resources based on policy criteria.³⁵ Their focus is placed on technologies at earlier maturity stages than typical green banks, and they provide non-diluting grants instead of project financing. Furthermore, 41% of SDTC funding contributes to energy utilization and power generation projects, while 59% goes to technologies that are not tailored to climate change mitigation. Although they achieve their mission, their focus on a very broad sector mandate and their technology maturity emphasis makes this organisation significantly differ from a traditional green bank design.

Following the unavailability of a tool to fund energy efficiency projects, in 2016, the Government of Ontario announced their plan to establish a provincial green bank as an investment in their five-year Climate Change Action Plan. Initially, Ontario prepared to commit USD 325 million to the “Ontario Climate Change Solutions Deployment Corporation” for projects that would fight climate change, grow the economy, and create jobs. The bank was to be capitalized by the revenue from the existing cap-and-trade system and would focus on funding clean energy projects in the residential efficiency and industrial sectors. This regulation, however, was revoked in November of 2019 under the Ford government.³⁶

Section 2: Green Banks

The absence of a Canadian organisation that fits the role of a green bank marks a missed opportunity to push the necessary small-scale energy efficiency projects needed to reach important climate goals.

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Section 3: Case Study

The data generated in the following tables was derived from the case study research completed for this report. Data was collected in alignment with an evaluation framework produced by the research team (see Appendix 1 for evaluation framework). The following tables highlight some of the key comparative information. For full results from the evaluation framework, please see appendices 2-5.

Table 2. Sources, mechanisms and use of capital in case study green banks.

Entity	Connecticut Green Bank	Mayor of London's Energy Efficiency Fund (MEEF)	New York Green Bank	Montgomery County Green Bank
Sources of Capital	System benefit charges, Regional Greenhouse Gas Initiative, federal funding, private investment	Public funding, private investment	System benefit charges, Regional Greenhouse Gas Initiative, state funds, private investment	Utility merger settlement, mission-driven private funding
Funding Mechanisms	Subsidies, co-investment, warehouse loans, specialized loan programs, credit enhancements	Direct loans, co-investment loans; equity investment in SME	Subsidies, direct loans, co-investment loans, warehouse loans, credit enhancements	Direct loans, co-investment loans
Uses of Funds	Residential, municipal, small business, and commercial; energy efficiency, renewables, other clean technology	Commercial; energy efficiency and renewables	Residential and commercial; energy efficiency, renewables, other clean technology	Residential, commercial, non-profits, and multifamily buildings; energy efficiency and renewables

Section 3: Case Study

Table 3. Key figures from case study green banks.

Entity	Connecticut Green Bank	Mayor of London's Energy Efficiency Fund (MEEF)	New York Green Bank	Montgomery County Green Bank
Year of inception	2011	2019	2014	2016
Current Leverage Ratio	8.7:1	1:1 (increasing in future); LEEF 5:1	2.6:1 (projected 8:1 by 2025)	5:1
Project sizes (dollars)	N/A	Targets investments btwn GBP 3m-20m	Participation in transactions btwn USD 5m-50m	Loans given btwn USD 3000-1m
Carbon Savings	1.1 million metric tons CO ₂ in FY19	4,590 tons CO ₂ e in FY19	10.9 - 18.6 million metric tons CO ₂ e (since inception)	N/A
Total Dollars Mobilized	USD 1.6 billion (since inception)	USD 262 million (since inception)	USD 2.4 billion (since inception)	USD 1.7 million (since inception)

Notes: Data as per FY19 Q4 reported numbers, unless otherwise notes; Total dollars mobilized includes private capital mobilized.

Section 4: Designing a Green Bank for Toronto

Green banks can be designed and implemented in several different ways, depending on market opportunities, the goals of the program, and potential partners and funding sources. This section compiles the practices of each of the four analyzed cases to suggest options for Toronto to consider when designing their incipient green bank. Nine elements of green banks are outlined below with multiple options for each.

1 BANK CREATION

Green banks can be created through legislative mandates, or executive orders.

Legislative Mandate

The Connecticut Green Bank, Montgomery County Green Bank and Mayor's Energy Efficiency Fund were created through legislation to perform a particular service or set of public functions. A legislative mandate allows for the fund to be written in the constitution, preventing it from short-term political preferences. While this mandate ensures operational continuity, it can be difficult to make changes as time progresses.

Executive Order

The New York Green Bank was formed by repurposing an existing fund. The New York Green Bank is an important part of Governor Cuomo's *Reforming the Energy Vision* plan focused on developing a "cleaner, more resilient, and affordable energy system" that is able to meet market demand.³⁷ While the executive order would imply reliance on general authorities as stated in the constitution, it will be difficult to secure public funding without appropriate legislative action.

Given the current barriers and challenges faced by the City, setting up a green bank via a legislative mandate can allow for program and incentive stability.

2 TYPES OF PARTNERSHIPS

A green bank can be either run by the City or as in partnership with other players, namely the private sector or non-profit organisations. While a bank run solely by the City will have the most control on operations, other types allow for more innovation in financing arrangements and display potential for long term self-sustainability.

Section 4: Designing a Green Bank for Toronto

Quasi-Public Fund

The New York Green Bank, Connecticut Green Bank, and Mayor's Energy Efficiency Fund, all operate as a quasi-public fund. In this structure, the staff and operational practices fall under normal state agency practices while all investment practices are free from the state's liability.³⁸ Quasi-public entities hence have limited state accountability and operate more independently. However, their liability is limited to the assets they hold. If there is a legislature, it can specify caps on the rate of return that can be promised to an investor.

Non-Profit Organization

The Montgomery County Green Bank acts as a tax-exempt non-profit corporation, serving exclusively as the county's green bank. It must at all times comply with the law that established the bank and the Council has the authority to suspend its operations or revoke the law. This organization is allowed to issue bonds and notes and assume its liabilities. They need to refrain from advocacy but are allowed to raise additional funds through external channels.

The Toronto Green bank would benefit from operating as a quasi-public corporation. A similar strategy was used for the restructuring of the Environmental Management Strategy of the Portland's in Toronto to dissolve tensions in public-private development arrangements, and to create a framework where a capacity for understanding both market and regulatory mechanisms exists.³⁹

3 FUNDING SOURCES

Monetary capital is typically initially generated from the reallocation of existing government sources. For example, the Montgomery County Green Bank was initially funded by the municipality following a large merger settlement, the Connecticut Green Bank partially from an existing public benefit charge, the New York Green Bank from older utility-funded programs, and the Mayor of London's Energy Efficiency Fund from the reallocation of the European Regional Development Fund. In addition to the reallocation of existing funds, the City of Toronto should consider additional sources of funding in designing their green bank to diversify and expand their financing streams, including system benefit charges, bond issuance, proceeds from carbon taxes, utility-funded settlement agreements, mission-driven private funding, and private investment.

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System Benefit Charge or Infrastructure Fee

A system benefit charge is a state-level program that collects capital through the electricity industry by surcharging all kilowatt hours (kWh) of energy sold through the distribution service.⁴⁰ These funds are then allocated to public interest areas such as energy efficiency, renewable energy, and low-income assistance programs.⁴¹ The New York Green Bank is partially funded by the USD 22.1 million allocated by the State's system benefit charge fund.⁴² Similarly, the Connecticut Green Bank is partially funded by a surcharge of USD 0.001 per kWh on all utility bills in Connecticut, which reaches USD 20 to 25 million annually.⁴³

Bond Issuance

Green banks can additionally issue bonds to obtain capital. Debt investors can secure steady streams of payments from an institution and in exchange, the green bank receives capital which is then invested into clean energy projects. For example, the Connecticut Green Bank sold USD 30 million in bonds backed by both the commercial energy efficiency loans in Connecticut and by the Clean Fund, which purchased USD 24 million of the 30 million.⁴⁴

Sale of Emission Allowances

Another investment opportunity utilized by the analyzed green banks was through proceeds from the sales of emission allowances. These proceeds can come from the Regional Greenhouse Gas Initiative, a mandatory market-based cap and trade program, or from other forms of carbon pricing. Both New York and Connecticut were allocated capital from Regional Greenhouse Gas Initiative's auction proceeds. The Connecticut Green Bank receives both funding from Regional Greenhouse Gas Initiative auctions as well as proceeds from renewable energy credits from state-financed projects. The New York Green Bank received a portion of their initial capital from the Regional Greenhouse Gas Initiative auctions, and will continue to annually receive USD 25 million until 2025.^{45 46}

Utility-Funded Settlement Agreements

Utility cases and merger proposals have provided green banks funding as parts of utility-state-stakeholder settlement agreements. For example, the Montgomery County Green Bank was capitalized with USD 25 million from the state utility commission's 2015 Exelon-Pepco merger settlement.⁴⁷

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Philanthropic Funding

Green banks can accumulate funding from philanthropic grants and certain program-related investments, which are programs in place to support specific causes. The Montgomery County Green Bank received over USD 1 million from philanthropic resources including grants from the Town Creek Foundation and the JPB Foundation, while Connecticut received a program-related investment of USD 3 million from the Kresge Foundation.

Institutional and Private Investors

Certain banks use institutional or private investment in combination with public sources of capital. The GBP 500 million Mayor of London's Energy Efficiency Fund is 90% financed by the Amber Infrastructure Group's investment. Additionally, after partnering with a crowdfunding platform and a financial institution to launch a solar financing program, the Connecticut Green Bank received a venture investment of USD 100 million to enable the partners to privatise the program.

Due to applicability constraints, we recommend that Toronto focus primarily on bonds, philanthropic grants, and private investments when considering adding to their initial capital.

4 FINANCIAL PRODUCTS

There are several different types of financial products that green banks can offer their customers. The types of products chosen establish the investment partnership with lenders and the repayment procedure for the borrowers. For example, a green bank could directly assist private lenders through offering financial products that reduce the loan risk level, or the green bank itself could be the lender. Depending on the current gap in the financing landscape, a green bank has the potential to offer several different products such as co-investment loans, credit enhancements, warehouse loans, direct loans, or the specialized loan programs PACE.

Co-Investment Loans

A popular financing opportunity is co-investment loans. A green bank could provide a direct loan into an energy efficiency project in tandem with a private sector partner. The green bank can offer secondary debt of varying ratios in relation to the private investors, while assuming the first loss position in the event of a default. This would both reduce the risk of the private investor and significantly leverage the public funds

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investment.⁴⁸ For example, Montgomery County Green Bank invests at a 5:1 leverage ratio with private investors, while Connecticut maintains up to 8.7:1.

Credit Enhancements

Public funds can be used as credit enhancement tools that reduce the risk to private investors and incentivise investment on better terms. Credit enhancements include loan loss reserves as well as loan guarantees. Despite a lower return on investment, credit enhancements have a large leveraging effect in the short term. The Connecticut Green Bank uses a third-party administered, on-bill commercial energy efficiency loan program for small businesses, in partnership with low-cost capital provided by a third-party bank, with a credit enhancement from the green bank. On-bill financing does not explicitly lower interest rates but lends itself to lowering default rates because it is integrated into an existing bill payment that the customer is making regularly, and it can be tied to service cut off.⁴⁹

Warehouse Loans

One method of funding small, standard clean energy projects is through aggregation, warehousing, and securitization. Green banks can aggregate loans for sale on the secondary market to achieve scale and diversity of risk to finance projects that may have varying credits, while reducing costs per loan and achieving a reasonable return on investment.⁵⁰ The aggregation can lead to securitization, which then allows the bank to warehouse the portfolio until a scale is reached to attract a private investor. In warehousing, the green bank receives their whole investment back, which can then be used for future funding opportunities. Through a securitization deal, the Connecticut Green Bank sold 75% of its USD 40 million Property Assessed Clean Energy (PACE) portfolio to Clean Fund.

Direct Loans

Direct loans of public funds through the green bank can itself initiate market activity, however it can also be used to attract senior debt investors into new markets within this field. This could include technology research into storage or fuel cells, which may not have an existing long-term repayment record.⁵¹

Innovative Loan Programs

Some green banks offer specialized loan programs such as the Property Assessed Clean Energy (PACE), on-bill financing, or through local improvement charges. In

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PACE programs, energy efficiency projects are financed with the property serving as collateral and the debt is tied to the property rather than the owner. The loan is repaid through annual property tax payments, thereby reducing risk for both private and public lenders. The Connecticut Green Bank serves as a direct lender, however, a green bank could also offer credit enhancements to attract private lenders in the market. This loan type is similar to on-bill financing, which is a loan program that would be repaid through customer utility bills. This option produces lower default rates and reduces credit barriers. Furthermore, loans can additionally be provided through local improvement charge financing. In such programs, home or building owners easily pay back loans through their monthly installments on property tax bills.

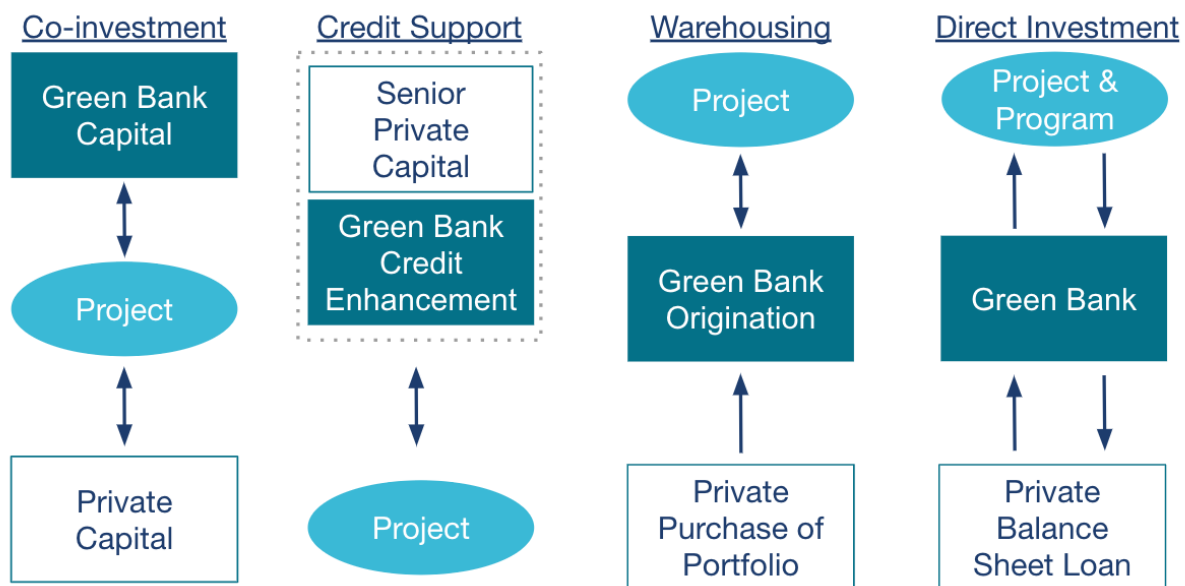


Figure 4. Visualization of Financial Product Structures Used In Green Banks

We recommend that Toronto consider all of the financing products and choose to employ at least three options.

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Key Takeaway: Leverage Ratios

For every USD 1 of Green Bank investment, the Connecticut Green Bank attracts USD 8.7 of private investment; a leverage ratio of 8.7:1. This all-time high leverage ratio was achieved in FY19 as a result of the Green Bank's financing solution for the SBEA program. The SBEA Program provides loans for energy efficiency upgrades to commercial and industrial - including municipal and state - customers of Connecticut's two largest investor-owned utilities, Eversource and United Illuminating ("UI") (the EDCs).⁵² The SBEA loans are repaid via the customers' utility bills. This is a highly secure repayment mechanism, and while on-bill programs do not explicitly lower interest rates, they lend themselves to lowering default rates as they are integrated into an existing bill payment that the customer is making regularly and can be tied to service cut off. Together, these factors lower risk, and as a result may lower the cost of financing, which will increase private investment. Integrating an innovative financing mechanism which lowers the cost of capital like on-bill recovery, or the aforementioned C-PACE and Local Improvement Charges, will help a Green Bank address the challenges associated with energy efficiency investments, and generate a higher leverage ratio.

5 MARKET DEVELOPMENT

Non-finance market development activities can be important tools to stimulate and generate demand for clean energy financing solutions. Green banks employ such activities to build a market base for clean energy in their region. Market development activities can be implemented from within the green bank, through the government, or by an external organization.⁵³ Among many options, these activities can be related to educating consumers, training implementation stakeholders, creating user friendly products, standardizing, and simplifying information, and centralizing administration. We are recommending that Toronto consider these three basic pillars that accompany green banks for market development.

User Friendly Product Design

By providing clean energy financing solutions that employ a turn-key product design and are simple for consumers to use, green banks ease and increase the adoption of financing programs. The elimination of burdens throughout the financing process allows for rapid market growth.

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Transparency and Simplicity

Access to simple and transparent market information enables market growth. Green banks have the ability to implement clear, accessible, and standardized information on programs, technologies, pricing, and financing.

Centralized Administration

Green banks offer a centralized system that eliminates all market confusion between energy efficiency programs that span several agencies of governments or utility organisations. By streamlining delivery and eliminating excess adoption and procedural steps, financing opportunities are brought to market in coordination and confusion is minimized.

6 SELECTION OF PROJECTS AND OBJECTIVES

The objectives and scope of projects should be well defined in the initial stage and must aim to align with other regional programs and policies. This design can help with addressing necessary gaps and stakeholder concerns, and equipping the green bank to deal with the market demand.

Active Stakeholder Involvement

There are many active programs that focus on provision of clean energy financing. For a Toronto green bank to be successful, it is imperative for all relevant parties to be involved in developing its base scope of work and operating procedures. This includes state agencies, financial institutions, utility providers, consumers, builders, and other channel partners. The green bank may then choose at what level would it like the involvement to be limited. For example, New York Green Bank works directly with project sponsors and financial institutions to deploy proven technologies and projects in renewable energy and energy efficiency. A similar pattern is noted in Connecticut, where the policy-makers drive the plan of action set out by the Connecticut Green Bank and they include the energy and economic departments of the state.

Determining Market Potential

A good understanding of the market is required to identify specific investment opportunities. Within the Toronto context, based on growth trends, focus could be on residential and commercial buildings in the energy efficiency sector. A specific focus allows for the green bank to design loan programs accordingly. For example, the New York Green Bank RFP program is designed so as to have different processes for

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different borrowers and needs, allowing it to segregate by channel partner and project type.

7 GOVERNANCE

Green banks greatly benefit from establishing boards that collectively direct management and the distribution of funds, as well as develop investment opportunities and generate political support. It is recommended that the board contain members with diverse skill sets and experience. Typically, at least one board member represents state agencies and expertise in the fields of finance, energy, or accounting are desirable. For example, the board of the Connecticut Green Bank includes the state commissioner of Energy and Environmental Protection and the commissioner of Economic and Community development, along with individuals from the private sector, including auditors and environmentalists; other government agencies; and the nonprofit sector. The Montgomery County Green Bank's 11-member board consists of members from the County Departments of Finance and Environmental Protection, law firms, the Connecticut Green Bank, finance advisory firms, investment companies, energy experts, the Housing Opportunities Commission, and the World Bank Group. The New York Green Bank's board contains representation from insurance, banks, and private equity firms.

Following the assembly of a board of directors, green banks hire a limited number of key staff members with the skills and knowledge to implement and run the bank. Employees of a green bank typically include an executive director, who reports directly to the board of directors and is responsible for day to day operations and management of the green bank, and additional administrative staff with expertise in banking, finance, and communications.

8 MEASUREMENT AND VERIFICATION

Proper mechanisms can ensure if the green bank is achieving its objectives and allow to review if the funding decisions are being properly managed.

Annual Plans and Audited Financial Statements

Most green banks are required by statute to file annual plans to the state. Connecticut, and New York prepare audited financial statements annually.

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Metrics Plan

The New York Green Bank is also required to submit quarterly and annual metrics reports to the Commission to provide updates on the program impacts based on the stated investment criteria and plan deliverables. The New York Green Bank's Annual Financial Metrics Report tracks an Impact Evaluation and a Market Evaluation to further support the goals of that Green Bank. The Impact Evaluation validates the overall energy, environmental, and economic impacts obtained through investment of funds, using industry standard approaches to remain consistent with other rate-payer funded programs. The Market Evaluation measures the impact of the investments on market change including how they address barriers, raise awareness, and increase end user knowledge about clean energy projects.

9 SUSTAINABILITY

One of the best features of a green bank is their ability to transform a one-time financial allocation into a long-term clean energy investment vehicle. When a sustainable, productive repayment strategy is employed, they can operate indefinitely without the need for additional capital. The recycling effect of finances practiced in green banks allows them to replenish funds and maintain their objectives of providing a sustainable mechanism of funding clean energy projects. It is recommended that Toronto consider these two factors when outlining their sustainable levels of return on investment needed to maintain the fund and cover all operating costs.

Return on Investment from Financial Products

Green banks are constructed to produce a return on investment that covers the operating costs, administrative fees, and margins for potential defaults or non-payments. Target returns depend largely on the type of products offered and their associated risks. For example, for direct loan programs, interest rates are set to cover the costs of the loan; in credit enhancement and loan loss guarantee financial products, returns for the green bank are generated through servicing fees which are charged to the borrower; and in warehousing programs, revenue is obtained after the sale of the repackaged loans on the secondary market.⁵⁴

External Investments

Green banks can invest their unallocated cash to generate additional revenue to both increase their potential fund and to cover operating expenses. For example, the New

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York Green Bank invests its surplus cash into U.S. Treasury bills, while the Montgomery County Green Bank invests in clean energy technology.

The nine design elements outlined above define the essence of successful green bank creation, however, there are other design facets that Toronto should consider, including those with economic, environmental, or policy objectives.

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Section 5: Stakeholder Analysis

STAKEHOLDERS

As deduced from conversations and interviews with City of Toronto staff members, six primary stakeholder groups have been identified as the focus of the programs, products, and service offerings of a Toronto green bank. They are channel partners, real estate, lender, government, non-government organisations (NGO), and tenants. Within each stakeholder group, there are several key stakeholders:

- **Channel Partners:** Architects, engineers, energy modelling experts, trades, construction workers.
- **Real Estate:** Property managers, property owners, developers, reits.
- **Lenders:** Large banks, small banks, environmental lenders, private banks.
- **Government:** Provincial, federal, Federation of Canadian Municipalities, municipality.
- **NGO:** Community groups, environmental groups.
- **Tenants:** Commercial, residential, industrial.

Each key stakeholder has a unique degree of influence and importance to a Toronto green bank project. To generate insight into the importance and influence of each key stakeholder, an Importance/Influence Stakeholder Matrix (see Figure 5) has been generated. The importance is defined as the priority given to satisfying the needs and interests of the stakeholder, while influence is defined as the power a stakeholder has to facilitate or impede the achievement of a Toronto green bank's objectives.

Section 5: Stakeholder Analysis

MAP

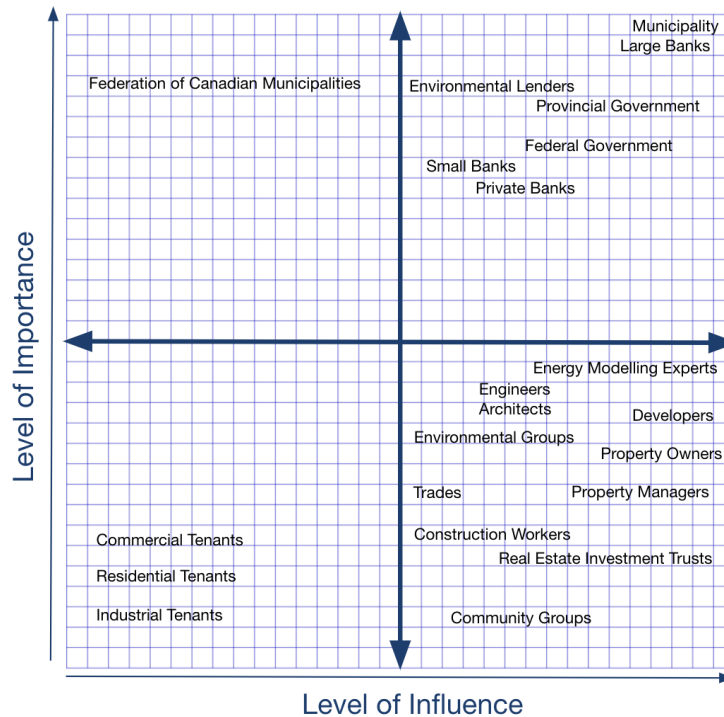


Figure 5. Primary stakeholders for the conceptualized Toronto Green Bank mapped on an importance-influence matrix.

High Importance, Low Influence: The Federation of Canadian Municipalities (FCM) sits in this category as the advocacy group represents over 2000 Canadian municipalities, and has significant ability to influence debate and policy. However, the FCM is an organization with no formal power, so this stakeholder does not have the direct ability to impede the development of a green bank in Toronto.⁵⁵

High Importance, High Influence: Large and small banks and lenders sit in this category because they both have high importance and influence. While there is reason to give a greater voice to the bigger banks who hold 90% of the market share and influence the majority of action, Toronto should seek strong representation from smaller lenders and actors as well, especially those that may be niche in the environment and energy efficiency space, and can engage the bigger influencers on the issue. The provincial and municipal governments also hold high importance and high influence, as their legal and jurisdictional authority give them the ability to facilitate or impede the creation of a green bank in Toronto. Additionally, the Federal government holds the

Section 5: Stakeholder Analysis

same status, as federal regulators around certain requirements, such as financing for example, play an essential role in the creation of a Toronto Green Bank.

Low Importance, Low Influence: Tenants sit in the low importance, low influence group because they are not the target customers of a green bank. It is the responsibility of landlords and property management companies to engage tenants on sustainability issues and the value of retrofits.

Low Importance, High Influence: Stakeholders in the real estate group sit in this category because they are customers. Customers of all types (i.e., homeowners, renters, businesses) will be the foundation of a green bank's success, so it is essential that priority be given to satisfying their needs. In addition to real estate stakeholders, it is essential that Community Groups and Environmental Groups, whose initiatives have similar objectives to the green bank, and are part of the broader environmental community and industry, have an opportunity to feed into the development process and share their concerns and ideas. Lastly, channel partners sit in this category because partnerships with qualified and certified contractors are vital to the success of the green bank model. Channel partners, from smaller and more local businesses to the largest of energy services companies and experts, are the direct link between the Toronto green bank and its customer base.

STAKEHOLDER ENGAGEMENT STRATEGY

The stakeholder engagement strategy is centered upon using the stakeholder map (see Figure 5) to guide the incorporation of the identified key stakeholders into the Green Bank development process. The research indicates that it is essential for a green bank to not only identify these groups and individuals, but engage with them directly to develop well-rounded ideas, implement transparency, become aware of industry-specific challenges, and understand best practices from each field. Additionally, these stakeholders will be utilized to help forecast the market demand for a green bank.

For efficient markets to grow, consumers and businesses need access to simple and transparent market information that informs purchase decisions. Information on programs, technologies, pricing, contractor quality and financing must be accessible and easy to find. The more standardized the documents, contracts, and information is, the better.

Section 5: Stakeholder Analysis

To implement this kind of transparency and create an environment where the leaders of a Toronto green bank can actively engage with the stakeholders, it is recommended that the bank establish an internal advisory committee. The advisory committee should consist of 20-25 stakeholders representing the identified key sectors (channel partners, real estate, lenders, government, NGO's, and tenants). The City will work with these stakeholders, and engage this internal group, to discuss ideas for the Green Bank and hear their opinions. To forecast market demand, it is recommended that a stakeholder engagement survey (see Appendix 6) be piloted with the internal stakeholder group. The survey will seek to gain feedback on a green bank in Toronto from the committee, and to better identify market opportunities for business growth. Once the internal group has provided feedback on the survey, it is recommended that the survey be distributed to a broader range of stakeholders (approx. 100-150).

To establish the internal advisory committee, it is recommended that the City leverage its networks. City employees should be engaged to nominate individuals who they feel would be informative, and have the capacity to provide well-informed, expert opinions. Additionally, City officials should use the Stakeholder Map (see Figure 5) to guide the selection of advisory committee members, and to determine which stakeholders merit a greater voice in proceedings. To be successful, the committee meetings should be half-day sessions that meet quarterly. Each meeting will have a defined objective and purpose, and members will be fully aware of why they are there and how they can contribute. It is recommended that the green bank hold additional meetings for large stakeholders who will influence the majority of action (i.e. large banks) to allow them the greater voice aforementioned, and because more effort will be required from them and there will be greater details to work out.

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Section 6: Conclusion

On the basis of the analysis, it can be said that a municipal green bank in Toronto would be well-positioned to overcome the governance and operational challenges that the City currently faces and is able to raise the capital required to achieve TransformTO 2050 objectives.

1) Green banks are capable of scaling solutions by mobilizing third party private capital using a variety of innovative financing tools to make public funding more efficient. A quasi-public corporation model has positioned them to share perceived risks and shifted liability away from public institutions. A similar model for a Toronto green bank can be successful, equipping it to fill the existing financial gap and overcome financial constraints by reducing dependency on the budget cycle.

2) Green banks are dynamic and flexible which allows them to finance projects across the spectrum of TransformTO goals, beyond infrastructure finance.

3) Green banks can accelerate other public policy objectives related to equity including investment in the local economy, job creation, economic development, and environmental protection.

ACKNOWLEDGEMENTS

The authors thank Chaim Koff for all of his support, guidance, and expertise in developing this report, and John Robinson for his inspiring passion for sustainability and unwavering support.

Appendix 1

APPENDIX 1. EVALUATION FRAMEWORK

CASE STUDY EVALUATION FRAMEWORK	
Scope	What is the region? What is the year of establishment? What are the types of projects?
Stakeholders	Who is the entity owner? Who are the primary stakeholders? What is the entity type (public, private, or public-private partnership)? Who are the borrowers? What are the sources of capital (grants and loans)? Who are the programs marketed to (channel partners or building owners)? Who are the implementation stakeholders (contractors, project managers, etc.)?
Scale	What is the total dollar amount of funded projects financed? What is the size of immobilized funds? What is the number of projects funded? What is the average loan size for one project? Is there prior capital in place? What is the bank's growth rate?
Financing Structure (segmented by borrower type)	What are the financing programs? What is the rate of interest of loans and/or incentives for investment programs? How long are the terms (max and min)? What is the leverage ratio? What is the deal structure (ex, risk) for the loans? Are loans secured? How are they secured?
Governance Structure	How many team members? How many members are on the board of directors? What is the industry representation on the board of directors? What is the internal structure (ex, types of business units)?
Approval and Evaluation Process	What is the application procedure? What are the evaluation criteria (technical and financial requirements)? Who evaluates/chooses projects? Is there a post-project invoice (do they take back left over money)?
Effectiveness	Is there any additional focus on equity (ex, for nonprofits)? What is the loan default rate? What is the energy/carbon savings? What are additional social impacts (ex, job creation)?

Appendix 2

CASE STUDY: CONNECTICUT GREEN BANK

1. SCOPE

The Connecticut Green Bank, commonly referred to as the CT Green Bank, is the oldest and most established of the four green banks researched. The bank operates in the region of Connecticut, and was established by the Connecticut General Assembly on July 1, 2011. The Bank has 3 primary project areas: energy efficiency, renewable energy, and clean transportation, and offers energy solutions for home, building and multifamily property owners, as well as residential and commercial contractors, towns and cities, and capital providers.

2. STAKEHOLDERS

2.1 Quasi-Public Agency

Pursuant to Public Act 11-80, the Connecticut Green Bank operates as a quasi-public agency. Quasi-public agencies are independent government corporations that are created through legislation to perform a particular service or set of public functions; they are not a traditional lending institution. Additionally, the powers of the CT Green Bank are vested in, and exercised by, a Board of Directors that consists of eleven voting and two non-voting members, each with knowledge and expertise in matters related to the purpose of the organization.

2.2 Primary Stakeholders

CT Green Bank identifies 4 primary stakeholders that are the focus of its programs, products, and services. They are: customers, capital providers, contractors, and policy-makers. The borrowers are homeowners, building owners, multifamily housing owners, residential contractors, commercial contractors, and towns and cities, and the sources of capital are loan programs, rebate programs, leasing programs, C-PACE, incentive programs, financing programs, and energy savings performance contracts. Green Bank CT markets programs to customers (i.e. homeowners, business owners, renters, not-for-profit, etc.) and to contractors. The goal of the bank is to bring customers and contractors together.

2.3 Implementation Stakeholders

The CT Green Bank has 3 primary implementation stakeholders: capital providers, contractors, and policy-makers.

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Capital providers include local (e.g., community banks and credit unions), state, regional, and national banks, as well as equity, tax equity, and other institutional, foundation, and crowd-sourced investors. The Green Bank provides several channels for capital providers to get into clean energy investing in Connecticut while earning a reasonable rate of return. Qualified contractors (from smaller and more local businesses to “ESCOs”, that operate on a regional, national and even global scale) are an important implementation stakeholder because they must have access to working capital to support the growth and operations of their businesses, while providing comprehensive clean energy solutions and financing options for customers. Lastly, the objectives and desires of Connecticut’s policy-makers drive the plan of action set out by the CT green bank. These policy-makers include the Department of Energy and Environmental Protection (DEEP), Department of Economic and Community Development (DECD), and other state agencies. The Electric Distribution Companies (EDCs) and Natural Gas Companies (LDCs). The Energy Efficiency Board (EEB) and Electric Distribution Companies (EDCs) are also important stakeholders, as they implement the Conservation & Load Management Plan (C&LM Plan) - an energy efficiency and demand management investment plan created by Connecticut’s utilities every three years.

3. SCALE

3.1 Projects Financed

Since its inception, the Connecticut Green Bank and its private investment partners have deployed over USD 1.6 billion in capital for clean energy projects across the state. 12,992 projects were approved in FY2019, and between FY12 and FY19, 42,092 projects were approved and closed. This figure represents 97% of the target of 43,293 projects estimated to be closed between FY12 & FY19.

3.2 Loan Size

At the CT Green Bank, an average loan size for one project does not exist as there is a diverse suite of products with differing loan sizes determined on a project-specific basis.

3.3 Pior Capital

As its main source of capitalization, the Green Bank receives a USD 1 million surcharge called the Clean Energy Fund from customers of Eversource Energy and Avangrid. On average, the Clean Energy Fund costs households about USD 10 a year and generates

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about USD 27 million a year to support the programs and initiatives of the Green Bank. Additionally, the CT Green Bank uses the state's carbon emission allowance revenue, from the cap and trade Regional Greenhouse Gas Initiative (RGGI), as financing for C-PACE.

The Green Bank also has access to the Special Capital Reserve Fund (SCRF), which allows quasi-public agencies to issue bonds for self-supporting projects or programs that are backed by the State of Connecticut, lowering the cost of capital for the program – in essence, having a no-cost insurance policy. The Green Bank has received USD 100 million in SCRF authorization that can be placed on bonds issued for clean energy programs.

Alongside public funds made available through state channels, the Green Bank also has access to federal funds, including stimulus monies, revolving loan funds, and competitive grant solicitations, as well as loan guarantees. The Bank received USD 20 million for "programs and initiatives" through the American Recovery and Reinvestment Act of 2009, and approximately USD 8.25 million of those funds are being used as credit enhancements for the Energize CT, Smart-E Loan, and CT Solar Loans, as of 2017.

3.4 Growth

Since 2012, the CT Green Bank's balance sheet has grown by a factor of 2.3x representing the value of its investments.

4. FINANCING STRUCTURE

4.1 Financing Programs

<u>Program Name</u>	<u>Description</u>
Commercial Property Assessed Clean Energy ("C-PACE")	Enables building owners to pay for clean energy improvements over time through a voluntary benefit assessment on their property tax bills. Funds 100% of energy upgrade project costs.
Green Bank Solar PPA	A third-party ownership structure to deploy solar PV systems for commercial end-use customers (e.g., businesses, nonprofits, municipal and state governments, etc.) that uses

Appendix 2

	a multi-year Power Purchase Agreement (“PPA”) to finance projects while reducing energy costs for the host customer.
Small Business Energy Advantage (“SBEA”)	Eversource Energy administers an on-bill commercial energy efficiency loan program for small businesses, in partnership with low-cost capital provided by Amalgamated Bank with a credit enhancement (i.e., subordinated debt) from the Green Bank. The loans are repaid on the electric bill.
Smart-E Loan	Residential loan program in partnership with local community banks and credit unions that provides easy access to affordable capital for homeowners to finance energy, as well as health & safety, improvements on their properties through a partnership between local contractors and financial institutions, IPC, and the Green Bank.
Multifamily Products (LIME)	Low income multifamily energy loan; funds energy improvement projects for low- and moderate-income properties. These loans are repaid from energy cost savings. <i>Multifamily family housing can also be financed using PPA and C-PACE.</i>
Residential Solar Investment Program	The Residential Solar Investment Program provides rebates that lower the initial out-of-pocket costs to homeowners who wish to install a solar photovoltaic (PV) system. It offers two types of incentives: The Expected Performance-Based Buydown (“EPBB”) and the Performance-Based Incentive (“PBI”).
EnergizeCT Health & Safety Revolving Loan Fund	Funded by the State of Connecticut Department of Energy and Environmental Protection (DEEP). Provides loans that permit owners of multifamily housing, serving primarily low-income residents, to remediate health and safety issues that must be completed in conjunction with, or that will enable, follow-on energy upgrades and improvements.

4.2 Interest Rates, Incentives, & Loan Terms

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<u>Program Name</u>	<u>Interest Rate/Incentive</u>	<u>Loan Term</u>
Commercial Property Assessed Clean Energy ("C-PACE")	Interest rates for the Capital Provider's Funding are determined by the Capital Provider.	Terms of the Benefit Assessment will not exceed 25 years, or the weighted average useful life of any Approved Project, whichever is less.
Green Bank Solar PPA	Rate varies; the property owner purchases the electricity generated by the solar system at an agreed-upon rate, often at a significant discount to grid power.	Standard agreement has a 20-year term.
Small Business Energy Advantage ("SBEA")	Loans are up to USD 100,000 for commercial and industrial customers and up to USD 500,000 for municipal customers: UI allows municipal customers to take out up to USD 500,000 in SBEA loans annually; Eversource allows municipal customers to have up to USD 500,000 in cumulative SBEA loans outstanding at any given time. 0% interest to the borrower.	SBEA loans are up to 48-months in tenor.
Smart-E Loan	5 Years: 4.49% APR 7 Years: 4.99% APR 10 Years: 5.99% 12 Years: 6.99% APR	Minimum of 5 years, maximum of 20 years. For 15 and 20 year terms lender participation varies.
Multifamily Products (LIME)	Interest rate is 6.00% - 6.99%.	Minimum 5 years, maximum 20 years.

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Residential Solar Investment Program	<u>EPBB: Purchase of Solar by Homeowner:</u> Up to 10 kW PTC, USD 0.426 per Watt PTC. 10 to 20 kW PTC, USD 0.328 per Watt PTC. <u>PBI: Lease of Solar by Homeowner:</u> Up to 20 kW PTC, USD 0.39 per Watt PTC.	The PBI is paid to the System Owner based on actual performance over the course of 6 years; no term for EPBB.
EnergizeCT Health & Safety Revolving Loan Fund	Rate is 2.99% per annum.	Loan term is up to 20 years plus construction period.

4.3 Leverage Ratio

The CT Green Bank's leverage ratio of private to public capital consists of the ratio of the total private capital employed, to the total public capital invested through the program. Since its inception, the Green Bank has mobilized over \$1.6 billion of investment into Connecticut's clean energy economy. Due to the bank's financing solution for the SBEA program, the organization achieved an all-time high leverage ratio of 8.7:1 in FY19 (7.3:1 in FY18).

4.4 Loan Structure

<u>Program Name</u>	<u>Structure</u>	<u>Securitization</u>
Commercial Property Assessed Clean Energy ("C-PACE")	C-PACE projects must have a Savings to Investment Ratio (SIR) greater than 1, meaning that projected lifetime savings from the improvements must exceed the total investment (including financing costs) over the lifetime of the measures. Green Bank does not assume any liability for: (1) workmanship or performance of any Project or third party, (2) any estimated cost savings associated with the Project including but not	Assessments are secured by and attached to the property.

Appendix 2

	limited to the savings to investment ratio, (3) the design, engineering or construction of the Project, (4) the adequacy or safety of the Project	
Green Bank Solar PPA	Connecticut Green Bank prescreens installers, owns, maintains and insures the system over its full life and stands behind it for 20 years. Green Bank provides full warranty management on all equipment. Multifamily property owners have the option to purchase their installation after 5 years. When the terms of your agreement end, you have the option to extend your PPA, purchase the system, or have it removed at no cost.	Financial security is sought via PACE mechanisms, where available. In instances where PACE is not available, all equipment will be secured via a UCC-1 filing.
Small Business Energy Advantage ("SBEA")	SBEA loans are repaid on the utility bill with loan payment included as a separate line item.	In the event that the amount paid for a given utility bill does not fully cover both the electricity and the loan, then payment is applied to electricity first and then loan.
Smart-E Loan	Long-term, low interest financing is offered by Energize CT, local contractors, and lenders (9 banks and credit unions). There is no down payment or fees required. The lender determines homeowner qualifications and how the contractor will get paid.	Financing is unsecured.

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Multifamily Products (LIME)	Loan to be used for energy efficiency and renewable energy improvements as provided in a lender-approved scope of work; up to 25% of loan proceeds may be used for non-energy efficiency improvements (structural, health/safety, etc.), provided there are sufficient savings to carry the costs. Must meet "Energy Savings Cost Ratio" (ESCR) of 1.30X and 1.10X for solar. Evidence of assets sufficient to pay six months' worth of interest payments is required.	Financing is unsecured.
Residential Solar Investment Program	For the EPBB, the incentive is paid directly to the Eligible Contractor on the homeowner's behalf when the system is complete. Connecticut Green Bank does not provide incentives for any portion of a system that exceeds 20 kilowatts PTC (kW PTC). The Green Bank calculates an efficiency rating for each system based on major design characteristics to determine whether homeowners will receive the standard rebate. The PBI requires little to no upfront cost. Under this model, an Eligible Third-Party PV System Owner owns the system and enters into a contract with the homeowner. The PBI is paid to the System Owner based on actual performance over the course	N/A

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	of 6 years, and is used to reduce the homeowner's monthly cost.	
EnergizeCT Health & Safety Revolving Loan Fund	The program is restricted to multifamily properties (5+ units) where at least 60% of the units serve low income residents, whereby low-income households are defined as households with incomes at 80% of Area Median Income (AMI) or less. Qualified uses include energy improvements and energy related health and safety measures.	Generally, loans less than USD 50,000 will be unsecured. Security on loans greater than USD 50,000 will be determined in the Green Bank's sole discretion.

5. GOVERNANCE STRUCTURE

5.1 Team Size

There are seven members of the management team, and twelve members of the board of directors at the CT Green Bank.

5.2 Board of Directors

There are four committees of the Board of Directors of the Green Bank, including Audit, Compliance and Governance Committee, Budget and Operations Committee, Deployment Committee, and the Joint Committee of the Energy Efficiency Board ("EEB") and the Green Bank. Board members include individuals from the private sector (CBIA, Coral Drive Partners LLC, Shipman & Goodwin LLP, GE Energy Financial Services), government (DECD, State Representative, Connecticut State Council of Machinists, DEEP, State Treasurer), and the not-for-profit sector (Operation Fuel).

5.3 Internal Business Structure

The organizational structure of the Green Bank consists of two business units: Incentive Programs and Financing Programs. Within the Incentive Programs unit, the Governor and the Connecticut General Assembly may decide that there are certain incentive (or grant) programs that they seek to have the Green Bank administer. The Green Bank administers such programs with the goal of delivering on the public policy objectives, while at the same time ensuring that funds invested by the Green Bank are cost recoverable. The Financing Programs unit is the Green Bank's core business. The use

Appendix 2

of resources by the Green Bank are to be invested with the expectation of principal and interest being paid back over time.

6. APPROVAL AND EVALUATION PROCESS

6.1 Application Procedure

<u>Program Name</u>	<u>Application Procedure</u>
Commercial Property Assessed Clean Energy ("C-PACE")	Find a C-PACE contractor to complete eligible upgrades as identified by Green Bank, scope out project, submit application through the C-PACE-CT Green Bank website.
Green Bank Solar PPA	Building owner selects pre-screened installer, Green Bank identifies the right size solar system based on energy needs, and then owns, maintains and insures the system over its full life.
Small Business Energy Advantage ("SBEA")	Eversource Energy administered an on-bill commercial energy efficiency loan program for small businesses, in partnership with low-cost capital provided by Amalgamated Bank with a credit enhancement (i.e., subordinated debt) from the Green Bank. The loans are repaid on the electric bill.
Smart-E Loan	Find a contractor to discuss energy improvements from the Green Bank approved list, select home energy upgrade in line with Green Bank eligibility requirements, get pre-approved by a participating lender, close loan with lender once project is approved.
Multifamily Products (LIME)	Complete application sheet (project information, building profile, energy profile, tenant information), submit required documentation (application, technical documents, financial documents), await approval.
Residential Solar Investment Program	The first step before installing the solar PV system is for homeowners to schedule an energy efficiency assessment. Next, the homeowner must find an eligible contractor who

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	will review the project with the homeowner. The Green Bank will pay the incentive directly to the eligible contractor who passes the savings onto the homeowner by reducing the total system cost. Lastly, install the system.
EnergizeCT Health & Safety Revolving Loan Fund	Complete revolving loan fund application (executive summary, property information, parties, project summary, borrower information), complete whole building energy audit, submit application electronically.

6.2 Evaluation Criteria

The Green Bank has an Evaluation Framework that guides the assessment, monitoring and reporting of program impacts and processes, including, energy savings and clean energy production and the resulting societal impacts or benefits arising from clean energy investment. This framework focuses primarily on assessing the market transformation the Green Bank is enabling, including:

Supply of Capital: Including affordable interest rates, longer term maturity options, improved underwriting standards, etc.

Consumer Demand: Increasing the number of projects, increasing the comprehensiveness of projects, etc.

Financing Performance Data and Risk Profile: Making data publicly available to reduce perceived technology risks by current or potential private investors.

Societal Impacts: The benefits society receives from more investment and deployment of clean energy.

Additionally, the Green Bank hires consultants to conduct evaluations of its programs as well as other studies which address specific needs and questions of interest to the clean energy industry and the Green Bank. Evaluation reports generally address the following questions: What framework should be used to understand and measure program performance and outcomes? What metrics should be used to measure program performance? How well is a program performing and how efficiently are program funds being utilized to achieve objectives?

6.2 Project Selection Process

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The selection process for a project may include the use of a review or scoring team, which may include members of any advisory committee, members of the staff of the Green Bank, and independent members with relevant industry, academic, or governmental experience. The selection will be made by the Green Bank after taking into account the established selection criteria, any report or recommendation by staff of the Green Bank, the report of any review or scoring team, and the results of any review and recommendation by any advisory committee to the Board. Applications are subject to the approval of the Board, or of the President or other officer of the Green Bank if authorized by the Board, after taking into account any report or recommendations of the staff of the Green Bank or an advisory committee.

7. EFFECTIVENESS

7.1 Equity

The Green Bank has developed an impact methodology to measure the equitable benefits arising from investment, installation, and operation of clean energy products:

Jobs: Working in consultation with the Connecticut Department of Economic and Community Development ("DECD"), through the work of Navigant Consulting, the Green Bank devised a methodology that takes investment in clean energy to reasonably estimate the direct, indirect, and induced job-years resulting from clean energy deployment.

Tax Revenues: Working in consultation with the Connecticut Department of Revenue Services ("DRS"), through the work of Navigant Consulting, the Green Bank devised a methodology that takes investment in clean energy to reasonably estimate the individual income, corporate, and sales tax revenues from clean energy deployment.

Environmental Protection: Working in consultation with the United States Environmental Protection Agency ("EPA") and DEEP, the Green Bank devised a methodology that takes the reduction in consumption of energy and increase in the production of clean energy to reasonably estimate the air emission reductions (i.e., CO₂, NO_x, SO₂, and PM_{2.5}) resulting from clean energy deployment.

Public Health Improvement: Working in consultation with the EPA, DEEP, and the Connecticut Department of Public Health ("DPH"), the Green Bank devised a methodology that takes air emission reductions to reasonably estimate the

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public health benefits (e.g., reduced hospitalizations, reduced sick days, etc.) and associated savings to society resulting from clean energy deployment.

7.2 Loan Default Rate

As of June 20, 2019, there have been no defaults.

7.3 Energy/Carbon Savings

Since inception, the Green Bank has reduced the energy costs of more than 40,000 families and 375 businesses. The Bank has accelerated the growth of clean energy to more than 350 MW (358.2 MW of installed capacity), and has helped reduce air emissions that cause climate change and worsen public health, including 5.1 million pounds of SO_x and 6.3 million pounds of NO_x.

7.4 Additional Societal Impacts

The Green Bank has supported the creation of 20,172 direct, indirect, and induced job years, and has created USD 206.7 - 466.7 Million of lifetime public health value.

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CASE STUDY: MAYOR'S ENERGY EFFICIENCY FUND

SCOPE

1. What is the region?

The project must be located within the 32 London Boroughs or the City of London.

2. What was the year it was established in?

2018

3. What are the types of projects?

MEEF is a sustainable investor, targeting a socio-economic return as well as a financial return on investment while addressing market failure. MEEF seeks to invest in projects that contribute towards one or all of the following: decrease in energy consumption, decrease in CO₂ creation, creation of renewable energy capacity.

Eligible project types: Energy efficiency, decentralised energy, ESCOs, energy storage, small-scale renewables, regeneration projects, electric vehicle charging infrastructure, renewable energy generation projects including innovative technologies such as energy storage and low carbon data centres, infrastructure and building retrofits.

Eligible technologies:

Category	Eligible Measures
Building envelope	Insulation
	Windows and doors
	Other building related thermal measures
Building Systems	Space Heating
	Domestic hot water
	Ventilation systems
	Cooling (active)

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	Lighting
	Building automation and control
	Connection to energy supplies (grid or storage)
	Decentralised energy systems based on energy from low carbon sources
Small-scale renewables	Typically less than 5MW

STAKEHOLDERS

1. Who is the entity owner?

Established by the Greater London Authority with funding from the European Commission, managed by the Amber Infrastructure Group.

2. What is the entity type?

Quasi-public agency

3. Who are the borrowers (target constituencies)?

Local Authority, NHS, Registered Providers, Education (Higher and Further), Charity, Voluntary, EScO and SME sectors.

4. What are the sources of capital (grants and loans)?

Investors: Greater London Area, Amber Infrastructure Group, INPP, Commercial Lenders.

MEEF is actively welcoming financing enquiries from prospective project sponsors.

5. Who are the programs marketed to (channel partners or building owners)?

Borrowers, building owners

6. Who are the implementation stakeholders (contractors, project managers, etc.)?

Usually the borrower chooses. The GLA has frameworks in place that can provide technical support, there is a program called Reflex around that framework that contracts for the public sector. Private sectors can do their own.

Appendix 3

SCALE

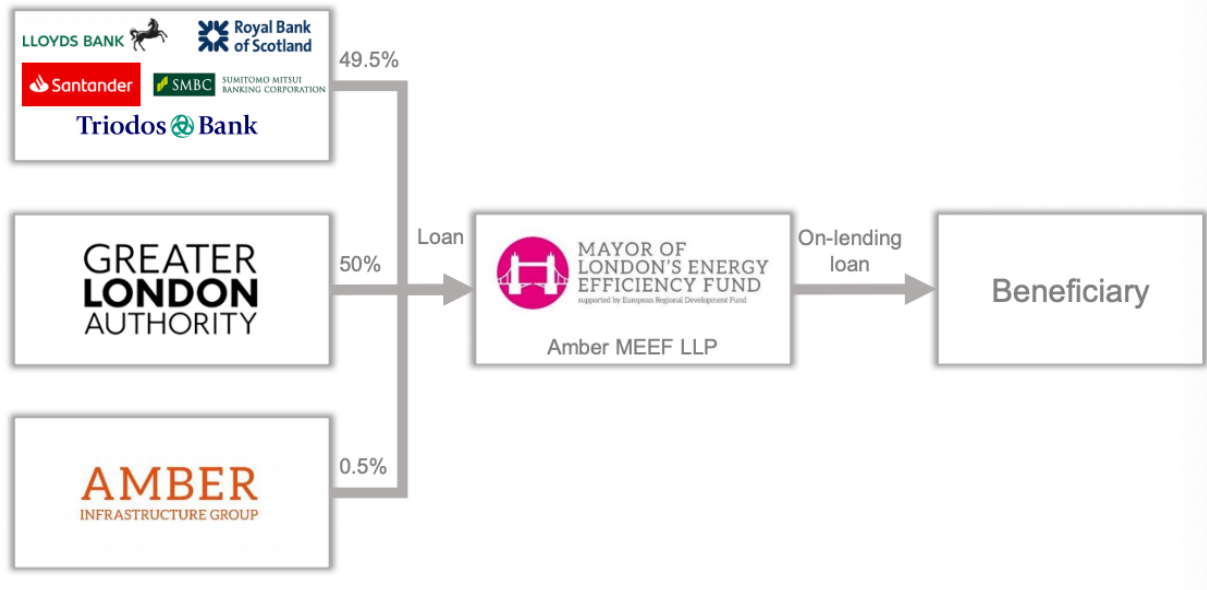
- 1. What is the total dollar amount of funded projects?**
After one year, 42% of Greater London Authority funds were invested.
- 2. What is the size of immobilized funds?**
58% of the initial fund remained after 1 year.
- 3. How many projects have been funded?**
3 project based on the European Commission's funding.
- 4. Is there prior capital in place?**
Funded with over £500m of commitments from the GLA, Amber and commercial funders. This provides MEEF with a breadth of funding appetite, allowing MEEF to deliver an appropriate suite of funders for each project.
- 5. What is the bank's growth rate?**
N/A

FINANCING STRUCTURE

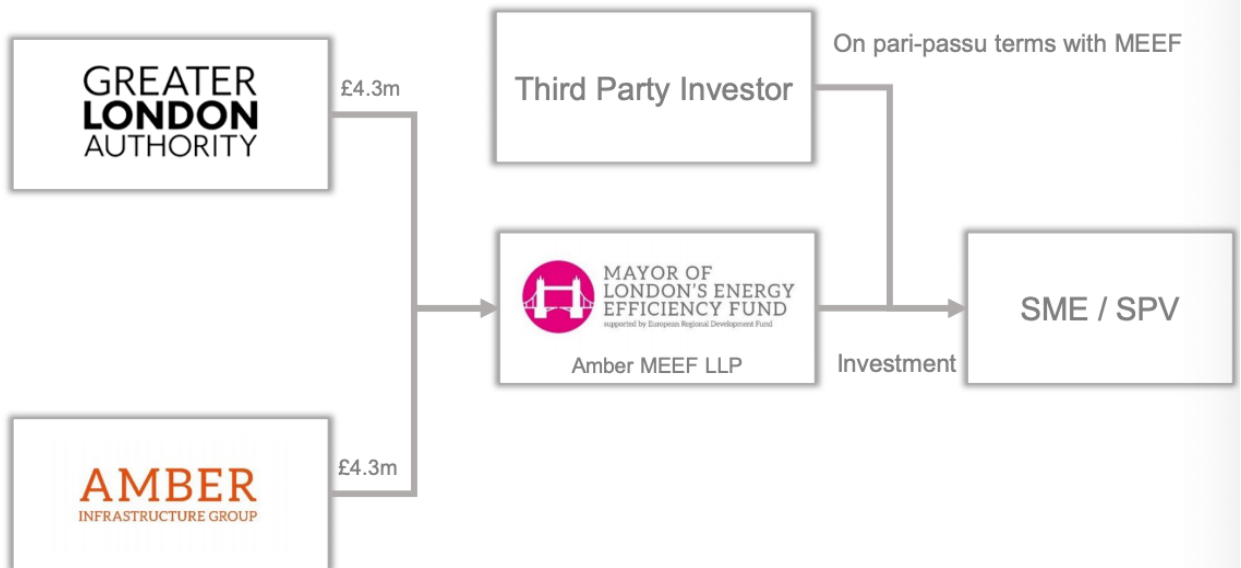
- 1. What are the financing programs?**
Can provide corporate or project financing solutions depending on the needs of the project. Can also provide framework loans which can be used for numerous smaller projects over a period of time as well as funding individual projects. Offers senior/mezzanine debt and equity.

Debt:

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Equity:



2. What is the average loan size for one project?

The fund targets investments of between £3m-£20m but can consider larger or small investments. Smaller projects will be considered on a case-by-case basis, but it may be appropriate to group buildings or parts of a project together for financing. Can fund up to 100% of the capital cost of a £1m+ project but could also part fund large scale regeneration projects which will have low carbon credentials: Energy Efficiency,

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Decentralised Energy, Small Scale Renewables, Energy Storage, Regeneration Projects, Electric Vehicle Charging Infrastructure.

3. What is the rate of interest of loans and/or incentives for investment programs?

At the moment, public project rates are 1.3-14% for an 18-year tenor. SMEs rates around 5%, every 3 years can take 3 million pounds using state aids.

Seeks to address market failure and hence can provide flexible terms, for example, the potential to roll-up interest during construction, to allow early repayment at no cost, to sculpt interest payments to energy savings for innovative technologies.

MEEF invests on state aid compliant terms by utilising state aid measures such as the General Block Exemption Regulation and De-Minimis Regulation.

4. How long are the terms (max and min)?

There is no set payback period required with maximum loan terms of up to 19 years. Draw-down of funds can be upfront or on a phased basis during construction.

5. What is the leverage ratio?

Try to match at least a pound of ERDF funds with a pound of bank money - interest rate is low at the moment so not as much match as looking for in the future.

6. What is the deal structure (ex, risks) for the loans?

Predominantly provides senior debt but will consider mezzanine and equity opportunities.

7. Are loans secured? How are they secured?

Loans are not secured.

APPROVAL AND EVALUATION PROCESS

1. What is the application procedure?

Overall timeline: 6 weeks to 3 months

Step 1: Project screening

- Project outline (sets out key information about the financial structure of the project, the Energy Conservation Measures (ECMs) to be used, and the forecast carbon and energy savings)

- Eligibility criteria

- Inception Meetings

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Stage 2: Application

- Application form **available on website
- Measurement and Verification plans
- Investment terms
- Loan Agreement

The MEEF team will assist potential applicants with this process; including reviewing drafts and discussing structures and the Fund's approach to measuring outputs. Feedback will be provided on all applications, which may include requests for further information. Indicative term sheets can be issued after reviewing the supplied information.

Stage 3: Decision to Invest

- Due diligence
- Investment committee approval
- Financial drawdown

2. What are the evaluation criteria (technical and financial requirements)?

Projects supported by MEEF should aim to deliver Energy Savings (kWh) from the Energy Conservation Measures (ECMs) of at least 20% and/or CO2 reduction of one tonne per £7,000 of investment made.

Prior to investment, technical, financial and legal due diligence will be undertaken to provide assurance on the project and its ability to deliver savings and repay the Fund's investment.

A draft funding agreement will be provided, setting out the terms of the investment, including pricing, drawdown and repayment profiles, and reporting arrangements.

Once due diligence has been completed, and the funding documentation agreed, the MEEF team can recommend an application for final approval from the Investment Committee.

Standard reporting on the project's progress is expected during construction and operational periods.

For MEEF, part of this reporting is on the implementation and results of the agreed 'Measurement and Verification Plan', where evidence of the energy and carbon

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savings made should be provided. The MEEF team and its appointed technical advisor may need to visit the installations and review energy savings.

3. Who evaluates/chooses projects?

Amber Infrastructure group assists with Project Screening and Applications, investment committee provides final approval.

Investment committee is made up of some of the members of the executive team at Amber who have 25-30 years of industry experience with experience in infrastructure, and one independent member.

4. Is there a post-project invoice?

No, although the project has to report on energy savings.

GOVERNANCE STRUCTURE

1. How many team members?

Eight team members on the MEEF project. Job titles: Lead and Sustainable Energy Co-Head, Finance Lead, Technical Lead, Financial Modelling & Business Analysis, Operations Manager, Sustainable Energy Co-Head, Energy Storage Lead, Energy Storage Expert.

2. How many members are on the Board of Directors?

No board of directors.

3. What is the industry representation on the Board of Directors?

N/A

4. What is the internal structure (ex, types of business units)?

Internal team at Amber Infrastructure that spends the majority of time of the MEEF fund. Certain members also work across the MEEF group in other energy infrastructure related projects.

EFFECTIVENESS

1. Is there any additional focus on equity (ex, nonprofits)?

A minimum of 70% of investments must be to the public sector: Local Authorities, Education (Higher Education & Further Education), Registered Providers, Health, Not for Profits

Up to 30% of investments can be in the private sector: SMEs, ESCOs

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2. What is the loan default rate?

N/A

3. What is the energy/carbon savings?

After one year of fund establishment, 13,450,990 kWh of energy was saved and 4,590 tonnes of carbon were saved.

4. What are additional social impacts?

None specifically stated.

Appendix 4

CASE STUDY: NEW YORK GREEN BANK

SCOPE

1. What is the region?

New York State

2. What was the year it was established in?

Launched in 2014.

3. What are the types of projects?

Solar, wind, and other renewable energy generation technologies, energy efficiency measures, electricity load reduction, clean transportation, sustainable agriculture, sustainable water, on-site generation and similar projects that support New York's clean energy objectives

STAKEHOLDERS

1. Who is the entity owner?

NYGB is a division of New York State Energy Research and Development Authority (NSERDA) and meets regularly with an Advisory Committee made up of representatives from both the public and private sector.

2. What is the entity type?

NYGB is a state sponsored specialized financial entity.

3. Who are the borrowers (target constituencies)?

- Developers of photovoltaic (PV) solar projects selling to commercial, industrial, and other institutional organisations
- Commercial and multi-family building owners, relevant lenders and investors and clean energy contractors and service providers
- Energy Storage Developers and other storage market participants

4. What are the sources of capital (grants and loans)?

Grants:

- The New York Public Service Commission (PSC) - USD 165.6 million to NYGB to begin operations (including USD 44.7 million from Regional Greenhouse Gas Initiative)

Appendix 4

- NYSERDA - USD 150 million
- PSC further gave USD684 million as NYGB is a key component of the Clean Energy Fund (CEF), a 10-year, USD 5.3 billion commitment by New York State to advance clean energy market growth and innovation while reducing ratepayer collections and driving economic development.

5. Who are the programs marketed to (channel partners or building owners)?

1. Private sector capital providers - financial institutions, third party capital provider, developers, energy service companies, property owners
2. Commercial and multi-family building owners
3. Clean energy contractors and service providers.

Major focus is on the Private sector.

6. Who are the implementation stakeholders (contractors, project managers, etc)?

Project sponsors and financial institutions.

GOVERNANCE STRUCTURE

1. How many team members?

There are 28 team members including: President, Managing Director: Legal & Regulatory Affairs, Strategy, Impact & Investor Relations, Investment & Portfolio Management, Risk & Compliance, Investment & Portfolio, Director, VPs, Associates, Analysts and 1 Office Manager

2. How many members are on the Board of Directors?

There is an advisory team of 4 members.

3. What is the industry representation on the Board of Directors?

The members of the Board are recruited for their diverse skills and experience.

Board representation includes members from an Insurance Company, a private bank, and two Private Equity firms.

4. What is the internal structure (ex, types of business units)?

Appendix 4

Legal and Regulatory, Impact and Investor Relations, Portfolio management, Risk and Compliance, HR

SCALE

1. What is the total dollar amount of funded projects?

NYGB has provided USD 909.2 million in overall investments in clean energy projects across the state. Those investments, the NYGB determined, supported clean energy projects with a total project cost of between USD 1.82 and USD 2.14 billion in the aggregate.

2. What is the size of immobilized funds?

The Active Pipeline of potential investments as of December 2019 was USD 625.4 million.

3. How many projects have been funded?

43 projects - 32 in Renewable Energy, 7 in Energy Efficiency, 4 Other

4. Is there prior capital in place?

NY Green Bank ("NYGB") has received over USD 3.9 billion in investment proposals since inception.

5. What is the bank's growth rate?

25% on average annually

FINANCING STRUCTURE

1. What are the financing programs?

NYGBs products include:

- a. Warehousing and aggregation credit facilities
- b. Term loans and investments
- c. Credit Enhancements
- d. Construction Finance
- e. Construction finance + term loan and investments

These products are priced to properly reflect risk positions in the capital structure and pricing for comparable transactions, as well as internal portfolio return needs.

Appendix 4

Moreover, NYGB also offers structured wholesale financial products and solutions and invests in sustainable infrastructure

2. What is the average loan size for one project?

NYGB considers various transaction sizes and participation levels (i.e., senior secured debt, equity), but largely expects its participation in any investment opportunity (whether related to a single asset or project portfolio) to fall within the range of USD 5.0 – USD 50.0 million.

3. How long are the terms (max and min)?

NYGB investments typically involve terms that limit or incentivize the use of NYGB investment proceeds to new or incremental project development in NYS. Average term length is 10 years.

4. What is the leverage ratio?

The leverage ratio as of Q4 FY19 was 2.6:1 (based on the range of 2:4:1 to 2.7:1).

NYGB's investment portfolio represents continuing progress towards an expected mobilization ratio of Total Project Costs to NYGB funds of 8:1, manifesting in USD 8.0 billion of clean energy and sustainable infrastructure projects mobilized in New York State by NYGB activity by December 2025 (including the effect of capital recycling). Currently at up to USD 2.14 billion.

5. What is the deal structure (ex, risks) for the loans?

Term loans are issued. A term sheet for each transaction is created laying out the project sponsor and financial institution partner in addition to a detailed metric plan

6. Are loans secured? How are they secured?

Yes. The loans are secured with the help of a project sponsor.

APPROVAL AND EVALUATION PROCESS

1. What is the application procedure?

NYGBs primary investment proposal intake occurs via submissions of RFPs. These RFPs cater to different borrowers and channel partners

Appendix 4

RFP 1: Clean Energy Financing Arrangements	Targeted for the private sector to help NYGB facilitate financing of clean energy projects within the state and help address financing gaps and barriers.
RFP 7: Construction & Back-Leveraged Financing for Ground-Mounted Solar	Targeted at developers of photovoltaic (PV) solar projects selling to commercial, industrial and other institutional organizations (C&I) in New York State.
RFP 8: Efficiency & Renewables Financing Arrangements: Building & Property Owners	Targeted at commercial and multi-family building owners, relevant lenders and investors, and clean energy contractors/service providers focused on such properties, who seek to finance the purchase of energy efficiency and/or renewable energy assets.
RFP 10: Financing for CDG Solar Projects Including Projects Paired with Energy Storage	Targeted at developers and owners of solar photovoltaic (PV) projects
RFP 13: Financing for Energy Storage Projects	Targets energy storage developers and other storage market participants.
RFP 14: Investment Valuation & Financial Advisory Consulting Services	Aimed at soliciting proposals from firms interested in providing investment valuation and financial advisory services to NY Green Bank in connection with its investments in clean energy projects and businesses and in sustainable infrastructure
RFI 7: Credit Enhancement for Tax Equity Providers in LMI Inclusive CDG Projects	Aimed at soliciting feedback from tax equity providers and other market participants to identify specific ways in which NYGB can be helpful in increasing the availability of tax equity financing for CDG projects in NYS that offer LMI-inclusive subscription terms.

2. What are the evaluation criteria (technical and financial requirements)?

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1. Transactions will have expected financial returns such that the revenues of NYGB on a portfolio basis will be in excess of expected portfolio losses;
2. Transactions will be expected to contribute to financial market transformation in terms of: Scale; Improved private sector participation; Level of awareness and confidence in clean energy investments; and/or Other aspects of market transformation; and
3. Transactions will have the potential for energy savings and/or clean energy generation that will contribute to GHG emissions reductions in support of New York's clean energy policies.

In applying the key investment criteria, NYGB also considers additionality, market transformation, impact benefits and transaction size and participation, each of which is discussed below:

Additionality

Additionality is the unique benefit that NYGB brings to the proposed financing or investment arrangement if any proposed project: (a) Would likely not occur given the current state of the private markets; or (b) Might occur in the private markets but would likely: i. Involve less favorable terms as to tenor, cost, fees and other key transaction terms; ii. Not happen at the market breadth needed to scale the sector; iii. Not involve the same level of focus on the NYS market; and/or iv. Not as quickly.

Transformation of Clean Energy Financing Markets

NYGB also assesses each proposed investment's contribution to clean energy financial market transformation in NYS through the: (a) Type and amount of capital applied to total project costs and other clean energy activities in NYS (referred to as mobilization); (b) Ability to scale or replicate the transaction to drive larger volume(s) of clean energy and sustainable infrastructure finance; and (c) Increased awareness of and confidence in clean energy and sustainable infrastructure investments, driven by and reflected in: i. Evolution of private sector institutional underwriting; and ii. Progress made toward capital markets solutions for: Contract standardization; Aggregation; and Clean energy financial performance data collection and utilization.

Impact & Public Benefits

Appendix 4

NYGB also considers the expected direct and indirect impact and public benefits of potential investments as determined by a number of factors, including: (a) Estimated energy savings and/or clean energy generation; (b) Other estimated GHG reduction benefits to the extent included in proposed project(s) (outside those achieved through direct energy savings and/or clean energy generation); and (c) The strength of the plan pursuant to which a counterparty (or designated third-party) tracks, records and reports performance data.

3. Who evaluates/chooses projects?

Team at NYGB reviews RFPs and partners with the right financial institution to mobilize the funds.

4. Is there a post-project invoice?

Yes.

NYGB monitors its counterparties' clean energy project installations throughout the duration of each investment through the receipt and review of periodic reports as well as updated impact benefit calculation factors advised by DPS. Based on information received, NYGB continually manages the actual and expected energy and environmental impact benefits across its portfolio.

As new information becomes available informing NYGB of NYS market uptake of clean energy projects, NYGB may correspondingly adjust (up or down) the overall portfolio's high and low estimated Total Project Costs and energy and environmental metrics (identified at closing of each investment, working with the relevant clients and counterparties and reflected in Transaction Profiles). Consistently monitoring and refining expected outcomes improves the accuracy of NYGB's portfolio-level estimate of impact benefits as it works towards meeting the CEF objectives to support the State's clean energy goals. Given such periodic adjustments, the aggregate estimated benefits reported in Quarterly Reports are the most up-to-date estimates (and so no longer will reflect the sum of the low and high estimated benefits specified in the Transaction Profiles at the time of each transaction close).

EFFECTIVENESS

Appendix 4

1. Is there any additional focus on equity (ex, nonprofits)?

No.

2. What is the loan default rate?

N/A

3. What is the energy/carbon savings?

Estimated Gross Lifetime Energy Saved by Fuel Type (Energy Efficiency): 25
199,000 – 238,000 MWh; and 0.95 – 1.13 million MMBtu

Estimated Gross Lifetime Clean Energy Generated: 16.9 – 20.7 million MWh

Estimated gross lifetime greenhouse gas emissions reductions: between 10.9
and 18.6 million metric tons, equivalent to removing between 151,261 and
183,599 cars from the road for a period of 23 years.

4. What are additional social impacts (ex, job creation)?

More than 40 clean energy jobs in the North Country and Western NY will be
retained through the continued operation of the wind projects, with continued
lease payments made to landowners and property taxes contributed to local
communities.

Appendix 5

CASE STUDY: MONTGOMERY COUNTY GREEN BANK

SCOPE

1. What is the region?

The MCGB provides financing for projects within Montgomery County, Maryland, USA.

2. What was the year it was established in?

The Montgomery County Council unanimously passed Bill 18-15 in June of 2015 which called for the creation of an independent non-profit to serve as Montgomery County Green Bank. The bank became operational in 2016.

3. What are the types of projects?

The MCGB provides County residents and businesses better loan rates, terms, and credit access for clean energy projects which save energy, lower county emissions, create a more resilient environment and economy, and help to achieve the County's environmental goals. The projects are predominantly building upgrades and retrofits including modifications/additions to insulation, HVAC systems, heating, solar PV's, energy storage, electric vehicle charging stations, and lighting.

STAKEHOLDERS

1. Who is the entity owner?

The green bank is a County-sponsored organization created by resolution. The entity is independent of the County but its charter comes from the County. The County has rights to dissolve the organization in which case all assets of the organization would revert to the County.

2. What is the entity type?

MCGB is a publicly chartered independent 501(c) 3 non-profit organisation. Although they are a government-sponsored enterprise, they are not part of the County government.

3. Who are the borrowers (target constituencies)?

The MCGB programs focus on commercial and industrial property owners and businesses, homeowners, multifamily property owners, common ownership associations, non-profits, and institutions.

4. What are the sources of capital (grants and loans)?

Appendix 5

Grants: MCGB was capitalized with a USD 25 million from the 2015 Exelon-Pepco merger settlement. The MCGB has also received over USD 1 million from philanthropic resources including grants from the Town Creek Foundation for three consecutive years and from the JPB Foundation in 2019.

Loans: The MCGB uses its capital to leverage the resources of financial partners including community banks, finance companies, and community development financial institutions. These partners provide their own capital in loans they originate to borrowers. Current commercial lenders include Ascentium Capital LLC, Latino Economic Development Center, and Revere Bank on the CLEER Financing program. Current Residential Lenders include NASA Federal Credit Union and Clean Energy Credit Union on the Clean Energy Advantage Program.

5. Who are the programs marketed to (channel partners or building owners)?

The programs focus on building owners looking to undertake energy efficiency or renewable energy projects. The program works with its contractor and lender partners to market its offerings.

6. Who are the implementation stakeholders (contractors, project managers, etc)?

MCGB partners with contractors who provide energy efficiency and clean energy services to customers in the Montgomery County region. Projects funded by the MCGB must use authorized contractors. The MCGB provides a comprehensive list of Commercial Loan for Energy Efficiency and Renewables (CLEER) and Clean Energy Advantage (residential) authorized contractors.

The Coalition for Green Capital, a non-profit aimed to accelerate the growth of clean energy markets through the creation of green banks, was an integral part of launching the MCGB. They conducted a market assessment, worked to pass legislation that created the bank, and supervised the organization from 2016-2017.

GOVERNANCE STRUCTURE

1. How many team members?

There are currently 3 team members: the Chief Executive Officer, the Chief Investment Officer, and an Administrative Assistant.

2. How many members are on the Board of Directors?

The Board of Directors consists of 11 volunteers.

3. What is the industry representation on the Board of Directors?

Appendix 5

The members of the Board are recruited for their diverse skills and experience. Board representation includes members from the County Departments of Finance and Environmental Protection, a law firm, the Connecticut Green Bank, finance advisory firms, investment companies, a renewable energy company, the Housing Opportunities Commission, and the World Bank Group.

SCALE

1. What is the total dollar amount of funded projects?

The MCGB has supported USD 1.7 million in projects to date. Another USD 3 million in projects are in the pipeline.

2. What is the size of immobilized funds?

The MCGB has USD 1.8 million in committed capital and another USD 4.5 million of potential commitments in its pipeline.

3. How many projects have been funded?

Two projects have been funded to date; another 4 projects are in the works.

4. Is there prior capital in place?

The MCGB achieved USD 25 million in capital investment in mid-2019.

5. What is the bank's growth rate?

From 2018 to 2019, the MCGB grew from USD 5.8 million to USD 23.8 million.

FINANCING STRUCTURE

1. What are the financing programs?

Option 1: Apply for tailored financing via a direct application request. The MCGB can provide financing tailored to a specific project - via direct financing or credit enhancements - for energy efficiency and renewable energy upgrades under certain circumstances.

Option 2: Apply for immediately available financing through their Partner Banks that offer the Commercial Loan for Energy Efficiency and Renewables (CLEER).

Option 3: Homeowners making energy improvements can apply to Participating Lenders in the MCGBs Clean Energy Advantage (CAE) program.

2. What is the average loan size for one project?

Appendix 5

Option 1 (tailored): Direct financing with project budgets up to USD 1,000,000 where no more than 65% of the total capital required for the energy improvements.

Option 2 (CLEER): USD 10,000 to 250,000 where at least 70% of the cost of improvements being financed. Loans can be larger with prior approval.

Option 3 (CAE): USD 3,000 to 35,000 in support of energy efficiency and renewable energy improvements.

3. What is the rate of interest of loans and/or incentives for investment programs?

Option 1 (tailored): Dependent on project factors.

Option 2 (CLEER): Rates vary by Participating Lender and are based on factors including borrower's credit, size of loan, term, and market conditions.

Option 3 (CEA): Unsecured interest rates start as low as 6.49% (final borrower interest rates are decided by participating lender and dependent on loan term, credit, and other factors of borrowers). Secured rates start as low as 3.00%.

4. How long are the terms (max and min)?

Option 1 (tailored): Dependent on project factors.

Option 2 (CLEER): 2 to 12 years

Option 3 (CEA): 2 to 12 years

5. What is the leverage ratio?

The MCGB targets to attract at least USD 5 of private capital for every USD 1 of their capital.

6. Are loans secured? How are they secured?

Option 1 (tailored): Flexible

Option 2 (CLEER): UCC-1 on the assets being financed.

Option 3 (CEA): unsecured (no lien on property) OR secured loans (lien on equipment)

APPROVAL AND EVALUATION PROCESS

Appendix 5

1. What is the application procedure?

Option 1 (tailored financing): Proposals are submitted and considered as they are received. Each proposal is reviewed against Green Bank evaluation criteria and those proposals meeting the criteria are further discussed by the Green Bank with Building Owners for potential investment by the MCGB. The application includes information on the property, the project, and finances.

Option 2 (CLEER financing): First choose an authorized CLEER contractor who will help establish the scope of work and determine the eligibility for CLEER financing. Then reach out to the MCGB participating lenders and complete an application form. Upon approval, they share specific loan terms available for the project. Once the lender is selected, they discuss further approval processes.

Option 3 (CEA): Choose an authorized contractor who will help you with improvement needs. They will determine your eligibility for the CEA program. They will help identify any utility incentives. Once accepted, you have access to CEA program lenders and their special CEA program lending terms for the project.

2. What are the evaluation criteria (technical and financial requirements)?

Project proposals from building owners must meet the following criteria: the project must undertake an energy retrofit measure or energy efficiency improvement; must achieve either a minimum reduction of energy consumption of 5% or add renewable energy improvements; must be expected to deliver positive operating cost savings; and be scheduled to begin within six months. Furthermore:

Option 1 (tailored): Proposals are evaluated based on: meeting green bank energy improvement financing goals (will it achieve a level of energy efficiency improvement, renewable energy deployment, or resilience goals); project feasibility; project timetable; project leverage; requested green bank financing terms; and relevant experience.

Option 2 (CLEER): Dependent on underwriting of the participating lenders.

Option 3 (CEA): Dependent on underwriting of the participating lenders.

3. Who evaluates/chooses projects?

Contractors identify customers. Lenders conduct their own independent underwriting.

Appendix 5

EFFECTIVENESS

1. Is there any additional focus on equity (ex, nonprofits)?

There is a target of 20% to be used for low- and moderate-income households and multifamily properties. There are special funds in support of nonprofits.

2. What is the loan default rate?

0% to date

3. What is the energy/carbon savings?

The MCGB exists to help the County reach its greenhouse gas emission goals.

4. What are additional social impacts (ex, job creation)?

The MCGB has a community goal that 20% of their funds should be used to support projects that benefit low-moderate income residents and multifamily properties. They also exist to create jobs and help drive the local economy.

Appendix 6

STAKEHOLDER ENGAGEMENT SURVEY

City of Toronto Conceptualizing a Toronto Green Bank Stakeholder Questionnaire

Purpose

This questionnaire is intended to gain feedback from relevant city-wide stakeholders to inform the development of a green bank in the City of Toronto. The current building retrofit programs that support TransformTO's ambitious climate action strategies are facing operational and governance barriers. In addition to challenges related to City debt, these barriers have resulted in a limited amount of long-term debt finance available for climate change projects as well as an insufficient flow of capital to achieve the necessary rate of retrofitting in the existing buildings sector. A municipal green bank is an opportunity to finance climate change mitigation projects by leveraging private capital.

The City is seeking your input to better understand the current market demand for the adoption of a green bank, and how the City can best support the acceleration of building retrofits through this tool. This information will be considered when determining the suitability of a municipal green bank in the Toronto context, as well as developing operational, financial, and governance structures of the proposed institution.

Instructions

Please provide responses to as many of the questions below as you are able, only in your respective category. Please feel free to include and expand upon any additional or existing points that you feel are particularly important or relevant. Any information you are able to provide is greatly appreciated.

Financial Institution:

- How much of your energy-related business is currently done in Toronto?
- Is there a mismatch between the demand for energy-focused capital and the supply of capital?

Appendix 6

- How would you characterize end-use customer demand for energy projects, and what are the key drivers?
- What would drive increased end user demand? What about investor demand?
- What financial instruments exist in the market for energy efficiency improvements?
- What are investor preferences?
- Are there any gaps in the financial products landscape? By energy segment, by project size, other?
- If you see an information gap, what specific information is hindering investment?

Energy Efficiency & Renewable Provider:

- How much of your business is currently done in Toronto?
- How do you create value in the market?
- How do you generate demand and acquire customers?
- Is there latent demand, in what segments, and how much?
- How is project capital sourced, and from whom?
- What constraints (both financial and nonfinancial) do you face?
- What types of financial instruments do you primarily use when raising capital?
- How could the Green Bank help you grow your business?
- How could the Green Bank assist your customers?

End-Use Customer:

- What is your current level of annual capital expenditure on energy efficiency and renewable energy?
- How do you make your energy efficiency and renewable energy capital decisions?
- How is capital sourced, and from whom?
- What constraints (both financial and nonfinancial) do you face? What financial instruments do you use?
- How could the Green Bank help you grow your business' investment in energy efficiency and renewable energy?

Appendix 6

- For commercial or residential developers seeking to make energy efficiency improvements to a building - is it challenging to receive financing from a traditional bank?

*Adapted from New York State Green Bank Questionnaire