

Using Green Investment Banks (GIBs) to Finance Low-Carbon Pathways

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Agenda

Introduction

- The carbon emissions problem
- Challenges to emissions reductions

Green Investment Banks (GIBs)

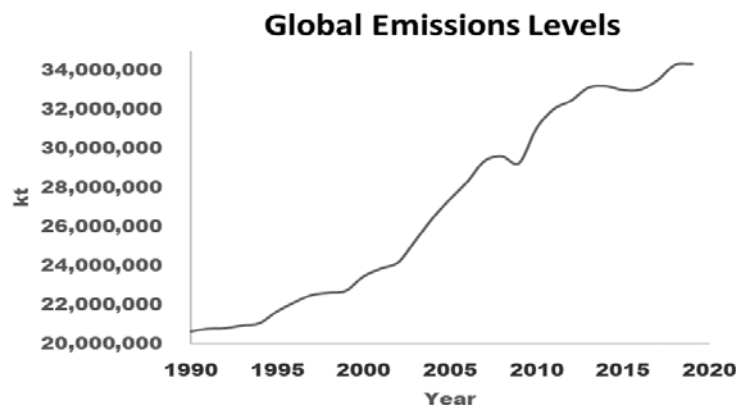
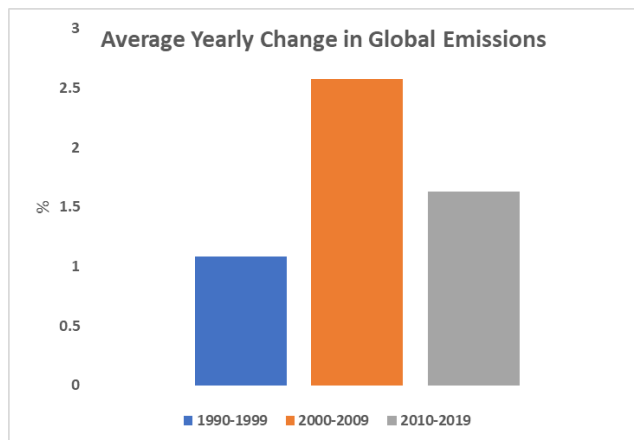
- Characteristics
- GIBs as an instrument for low-carbon economic growth

GIBs as municipal instruments in Canada

- The Atmospheric Fund (TAF)
- Low-Carbon Canadian Cities (LC3)
- Green Municipal Fund (GMF)

Conclusion

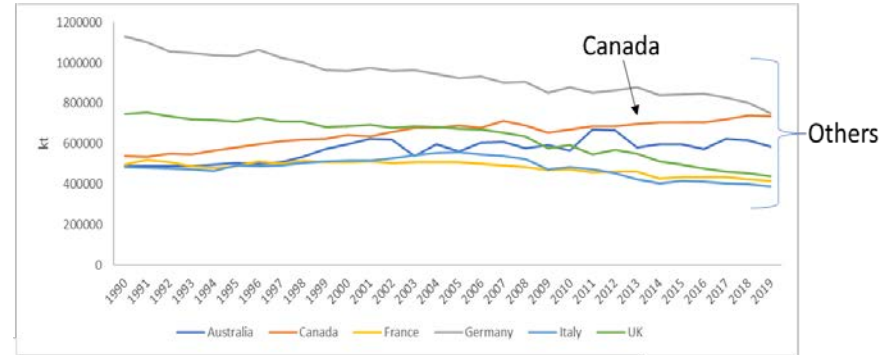
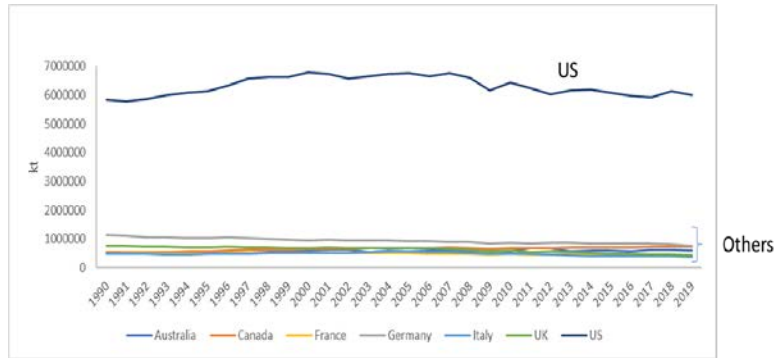
Introduction: What is the problem?



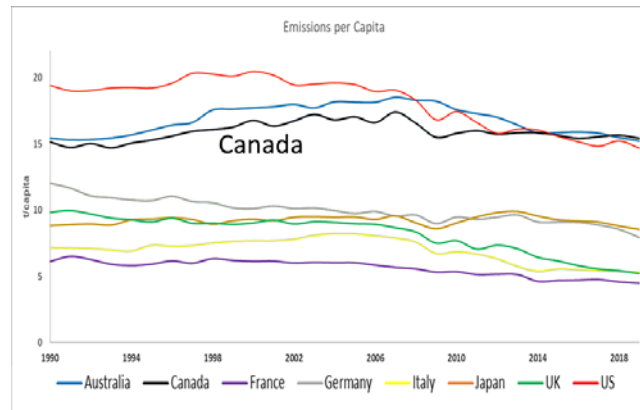
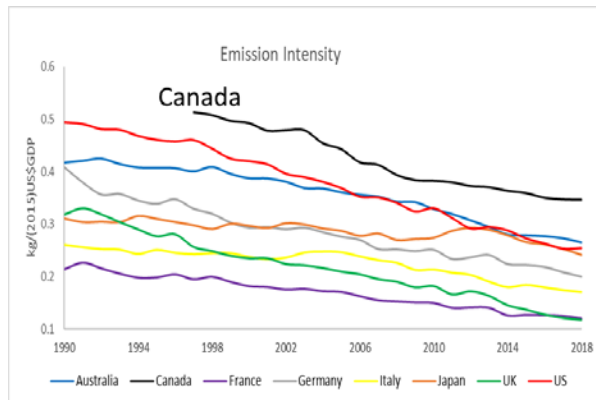
Carbon emissions continue to increase though rate of increase has declined between the last two decades (UNFCCC, 2020)

Without significant reductions in overall levels of emissions, climate risks will have increasingly detrimental effects on many aspects of life (IPCC, 2022)

Introduction: Canada lagging in emissions abatement

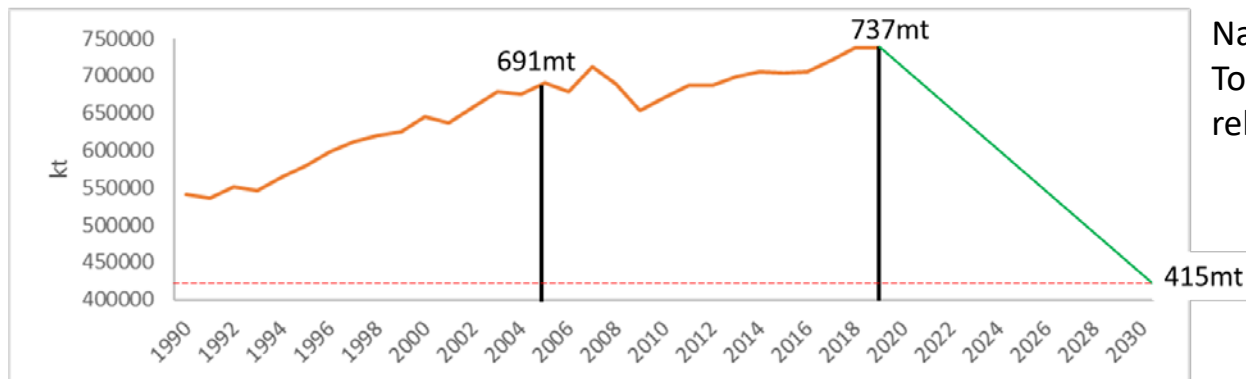


Total emissions in Canada has been increasing over the last 10 years



Emissions intensity (emission per GDP) and emissions per capita has been decreasing, though Canada remains above county peers

Introduction: Canadian emissions reduction target



Nationally Determined Contributions:
Total emissions reduction of 40–45%
relative to 2005 level (by 2030)

Canada behind other G7 countries
in emissions targets and outcomes

Country	Current emissions reduction target (minimum)	Actual emissions reduction (between base year and 2019).
Canada	40%	-7% (increase)
France	55%	16%
Germany	55%	34%
Italy	55%	20%
Japan	46%	13%
UK	68%	41%
USA	50%	11%

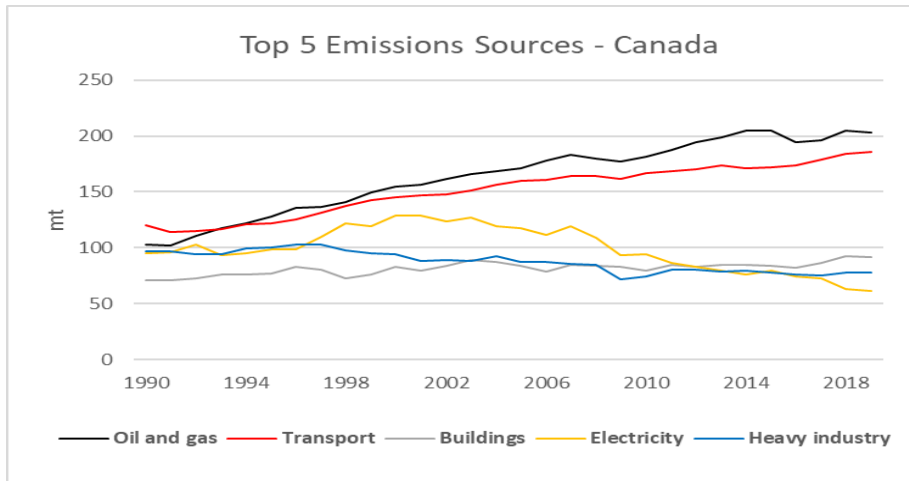
Introduction: What is being done?

Reiterating the problem:

- Canada wishes to reduce emissions by 40-45% by 2030, relative to 2005 levels
- Canada's emissions level has been rising for the last decade while other industrial peers have achieved reductions
- So what is being done to achieve emissions targets?

Introduction: What is being done?

Policy support with focus on key emission sources



Regulations on methane output & clean fuels

100% zero-emissions vehicle policy (light vehicles) by 2035

100% zero-emissions vehicle policy (medium and heavy duty vehicles) by 2040

Introduction: What is being done?

Carbon pricing policy commitment

- Carbon tax schedule extended to 2030
 - \$15 increase per year from \$50/tonne in 2022 to \$170/tonne in 2030
- Low-carbon financial support (existing and planned)
 - Government funds established to support investments in low-carbon technology

Canada Infrastructure Bank (CIB) — \$5 billion green infrastructure mandate

Other financial support for electrification of transport

Other funding support

Introduction: Challenges

Challenges to achieving emissions reductions

- Billions in public financing
- Hundreds of billions of total financing required in the long-term
- Financial sector support needed
 - Mobilize private finance to scale-up public funds

Increase total financing available for low-carbon investments

Drive market changes to create low-carbon economic transformation by directing financial capital to low-carbon investments

Introduction: Challenges

Challenges to low-carbon financing

- Unfavourable risk-return profiles

Expected return on investments may not justify the level of risk in the project

Often common issue with uncertain/unproven technologies and business models

Larger infrastructure projects typically require high upfront capital with long payback periods

Longer payback periods may increase cash flow uncertainty (more time for things to go wrong)

Introduction: Challenges

Challenges to low-carbon financing

- Asset-liability mismatch for larger infrastructure projects being funded by banks
- Basel III regulator requirements

Risk-weight for project finance can be as much as 130% (pre-operational phase), declines to 100% (operational phase)

Basel III liquidity coverage ratio and net stable funding ratio intended to make banking systems more stable also constrains long-term asset financing

Introduction: Challenges

Reiterating the challenge:

Public financing is insufficient to provide the investments needed for Canada to meet emissions targets

Private financing is necessary

There are barriers between private finance and low-carbon investments

Green Investment Banks (GIBs) have been designed to address these barriers

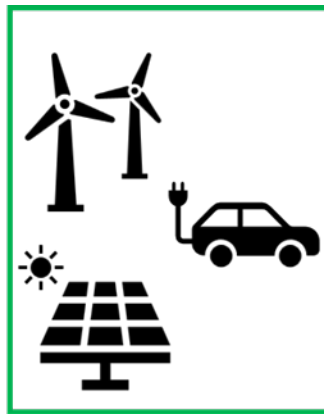
What are GIBs? And how have they been used?

Green Investment Banks (GIBs)

What is a GIB?

A Green Investment Bank (GIB) is a financing entity (public/quasi-public) characterized by a mandate that focuses on the mobilization of private financial capital towards domestic low-carbon economic development (OECD 2017; National Resources Defence Council et al., 2016)

**Can be viewed as very streamlined development financial institutions (DFIs)
Focused on attracting private financial capital to low-carbon investments**



Finance low-carbon investments

Green Investment Banks (GIBs)

Characterizing GIBs

- Governance structure
How are GIBs' management and operations arranged?
- Capitalization method
How are GIBs funded?
- Asset vehicles
Financing vehicles?
- Performance measurement
How is performance measured?

Green Investment Banks (GIBs)

Characterizing GIBs

GIB characteristic	Typical arrangement
Governance structure	GIBs are typically established through government legislation as government corporations Legislation outlines the institution's mandates and operational functions Corporate governance is executed through appointed board of directors
Capitalization method	Initial capitalization is typically via public (government) funds Public funds can be appropriated on a recurring basis or over a fixed term until the GIB becomes self-financing
Asset vehicles	Long-term financing instruments/arrangements
Performance measurement	Amount of GHG reduced/amount of clean energy produced Private capital leverage ratio: Amount of private capital attracted per \$1 of GIB capital deployed

Green Investment Banks (GIBs)

The design and operations of GIBs vary based on their domestic needs

Vary in size, scope, and function

National Level

Australia – Clean Energy Finance Corporation (CEFC)

UK – Green Investment Group (GIG)

Subnational Level

US

CT – CT Green Bank

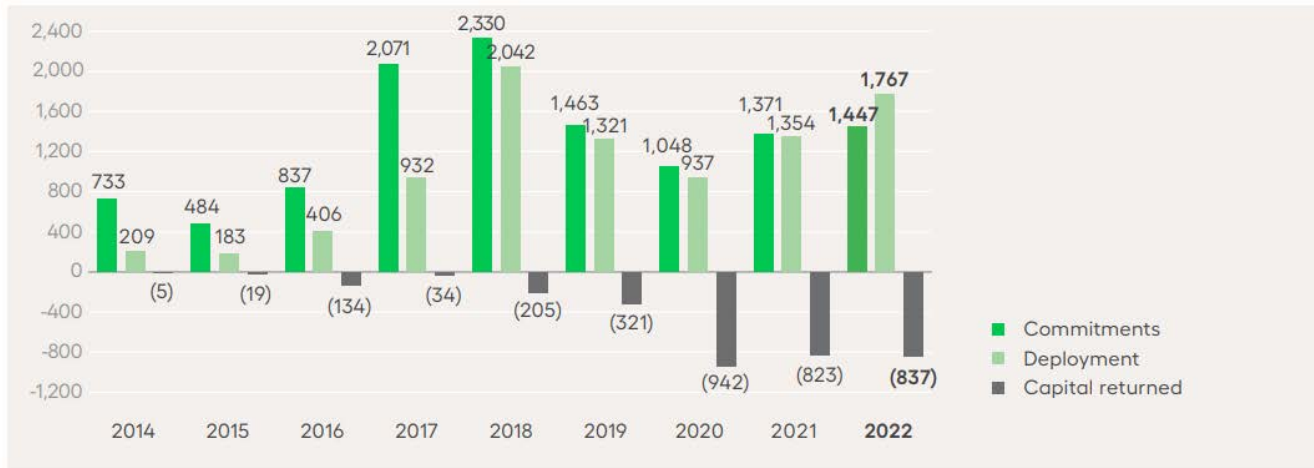
NY – NY Green Bank

Green Investment Banks (GIBs)

Some notable GIBs around the world

Australia – Clean Energy Finance Corporation (CEFC)

- Established in 2012 (government corporation)
- Capitalized with AUD10 billion (AUD2 billion per year between for 5yrs)
- Key investment areas: solar and wind generation (3.6GW from AUD2.65 billion of total investments); commercial and residential renewable energy investments (AUD1.92 billion); asset/fund financing (AUD2.66 billion)



Green Investment Banks (GIBs)

Some notable GIBs around the world

UK Green Investment Bank (UKGIB)

- Established in 2012 (government corporation) – privatized 2017/2018
- Initially capitalized with GBP3 billion (government budget)
- Key investment areas: focused on offshore wind (over 70% of deployed capital up to 2016 was in offshore wind equity financing), waste-to-energy, and energy efficiency financing. Up to 2016, the UKGIB deployed GBP2.1 and attracted GBP6.4 billion
- UKGIB was very instrumental in the development of UK offshore wind energy projects, which is a major area of renewable energy focus for the UK's emissions reduction targets

Green Investment Banks (GIBs)

Some notable GIBs around the world

Connecticut (CT) Green Bank

- Established in 2011 (government non-profit corporation)
- Capitalized initially via an existing state climate fund (funded by utility ratepayer surcharge charged by the state's public utility regulator)
- Additional capital from ETS (emissions trading scheme) allowance proceeds and bond issuances
- USD322MM attracted USD1.95 billion of total investments (lifetime to 2022)
- Key investment areas: residential and commercial solar energy upgrade financing; transport electrification; Power Purchase Agreements (PPA) financing.
- Green bond market development (~USD80MM in green issuances)
- Mini-bond offers – reduced face value to encourage more retail investor participation

Green Investment Banks (GIBs)

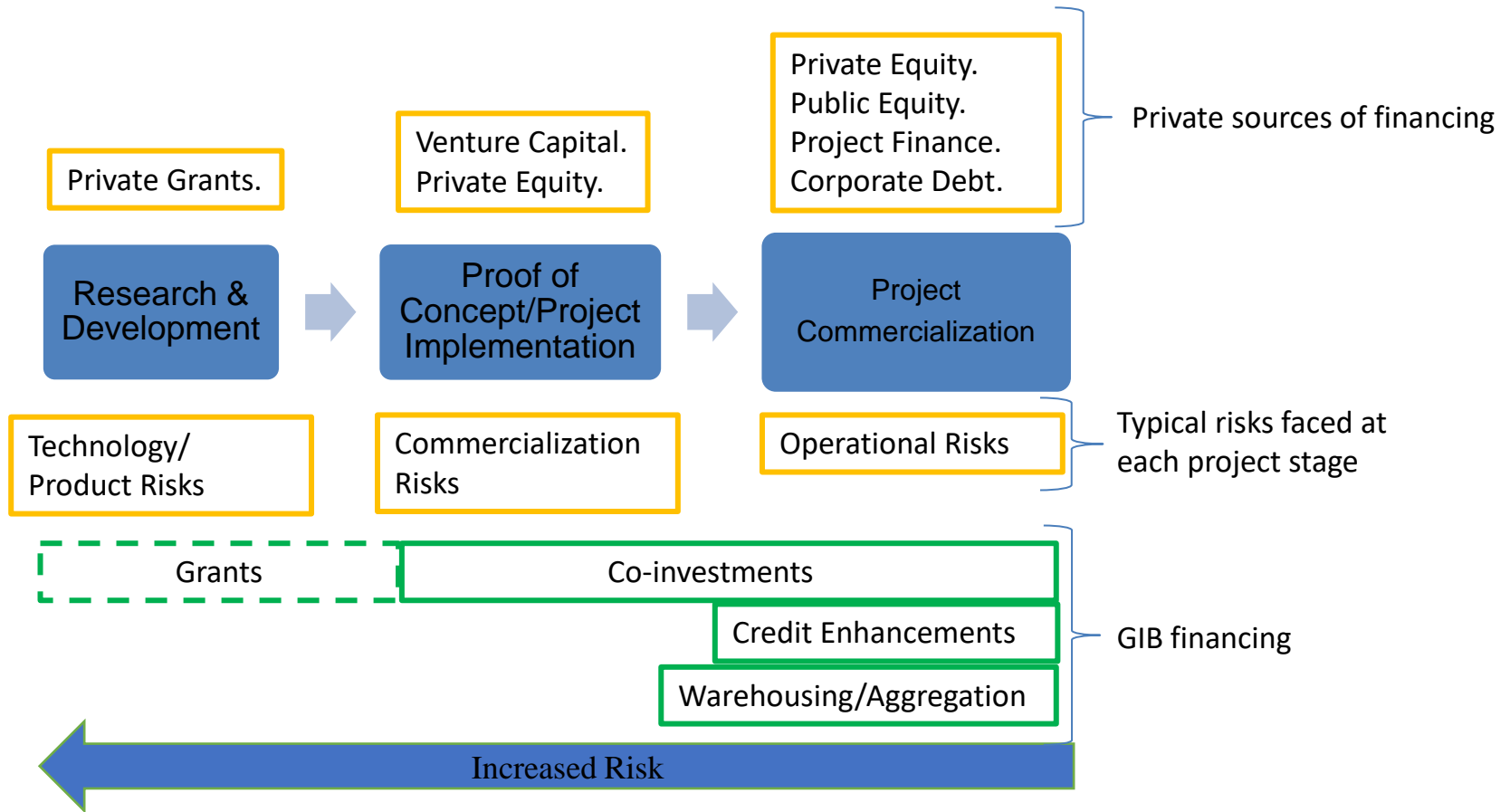
Some notable GIBs around the world

NY Green Bank

- Established in 2013 (division of NY State Energy Research and Development Authority – NY state corporation)
- Capitalized with USD1 billion from NY utility ratepayer fund, and other state funding sources. Lifetime capital deployed USD1.7 billion, and private capital attracted USD2.8 billion. USD1.3 billion in recovered capital
- Focus on commercial investments (typical investment size USD10-50MM)
- Key investment areas: solar energy generation (about 50% of lifetime investments); building decarbonization; wind energy generation; clean transportation

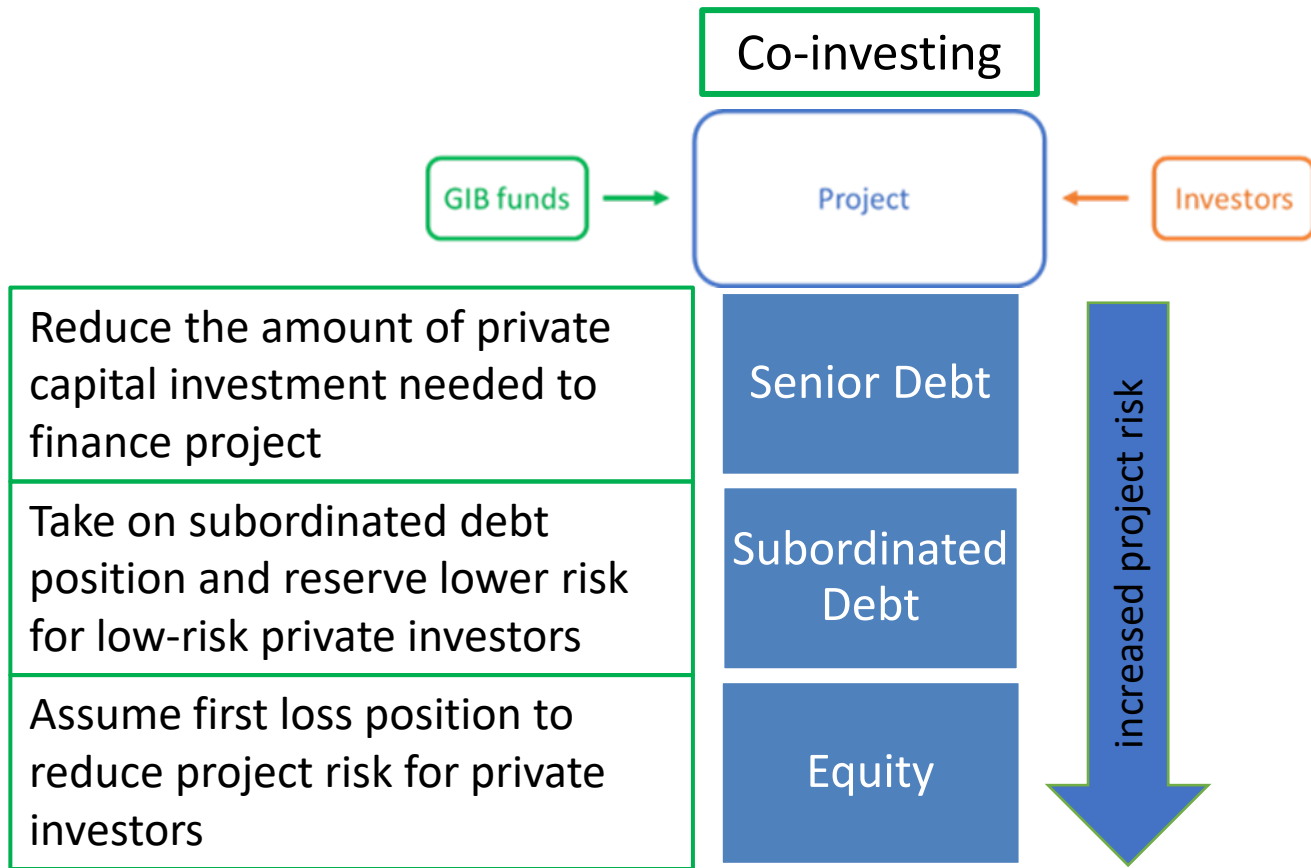
What do GIBs do?

GIBs are designed to fill the financing gaps that exist in the low-carbon financing landscape/reduce barriers to low-carbon financing



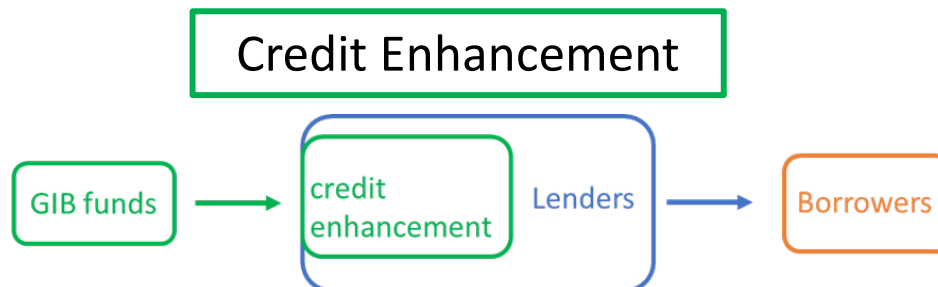
What do GIBs do?

Reduce private financing barriers



What do GIBs do?

Reduce private financing barriers

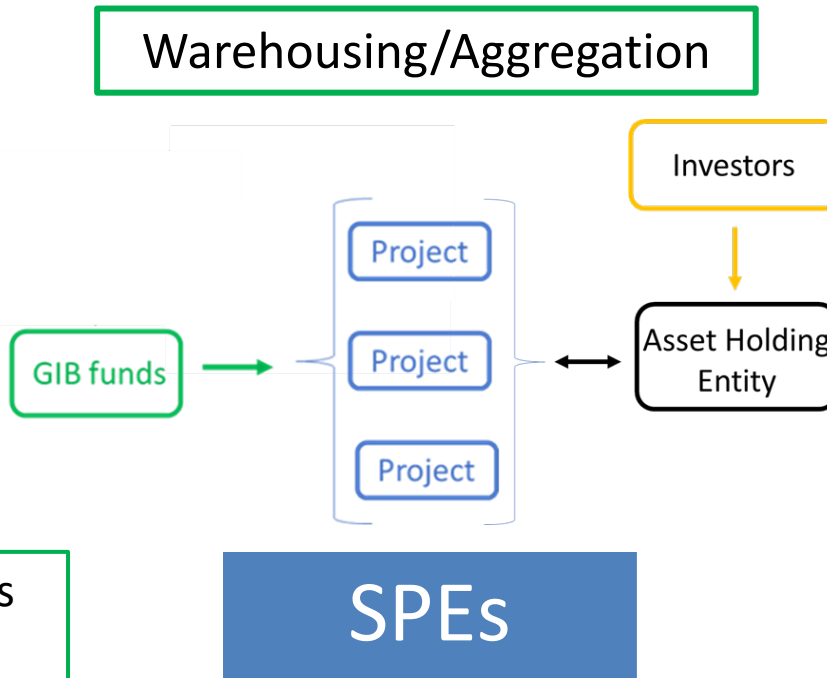


GIBs use credit enhancement instruments (i.e., loan guarantees) to reduce credit risk for lenders

Loan Guarantees

What do GIBs do?

Reduce private financing barriers



GIBs can originate smaller projects and aggregate them into asset vehicles that can be scaled into larger projects for large investors (i.e., institutional investors)

What do GIBs do?

GIBs can also complement carbon pricing policies

Recycle carbon tax or ETS (emissions trading schemes) allowance revenues:

Green Finance Organization (Japan); CT Green Bank (US); NY Green Bank (US)

Effective revenue recycling of carbon tax can also improve the political appeal of said tax (Baranzini and Carattini, 2017)

Support is usually increased when revenues generated through carbon pricing policies are recycled into investments in environmental projects (Amdur et al., 2014)

GIBs can also be leveraged in capacity building that support low-carbon transformation.

Awareness building

Policy advancement

Specialized expertise development – Japan's GFO, UKGIB

Signalling – GIBs develop reputed expertise. Their capital direction signals confidence to private investors

A Role for GIBs in Canada?

GIB-like entity in Canada

- TAF (the Atmospheric Fund)

(Municipal) non-profit corporation established in 1991 (via legislation)

City council appointed board of directors. Operates within the GTHA

Capitalization

- \$23MM – City of Toronto endowment (1992)
- \$17MM – Provincial endowment (2016)
- \$40MM – Federal endowment (2020) – via Green Municipal Fund (Federation of Canadian Municipalities)

Key investment areas: building decarbonization; transport electrification

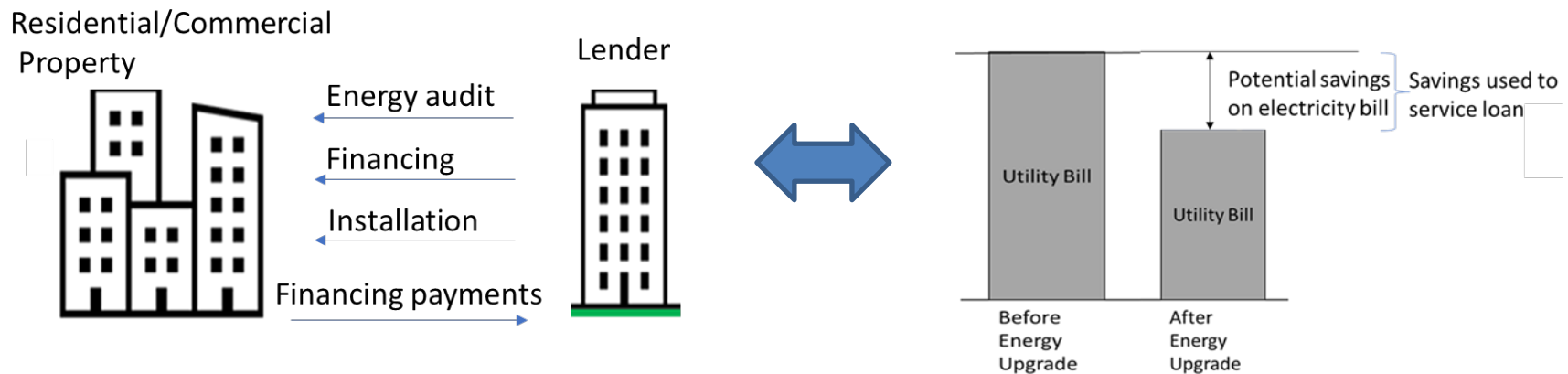
Together buildings and transportation account for ~75% of emissions in the GTHA

GIB-like Entities in Canada

- TAF (the Atmospheric Fund)
 - **Capacity building**
 - TransformTO
 - Co-founded and co-directing (with City of Toronto Environment and Energy Division) city's long-term emissions plans
 - Advancing Green Development Standards (GDS) across GTHA municipalities
 - Private and municipal-owned development to satisfy low-carbon requirements
 - **Energy Savings Performance Agreement (ESPA)**
 - Financing arrangement development by TAF to finance energy efficiency/upgrade retrofits in buildings
 - Finances energy efficiency retrofits through energy savings
 - Efficiency Capital
 - Private (for-profit) company incubated by TAF. Now administers ESPA
 - \$50MM from Canada Infrastructure Bank (CIB) into a SPE to expand energy retrofits for buildings.

GIB-like entities in Canada

- TAF (the Atmospheric Fund)
 - Energy efficiency upgrades financing program
 - ESPA (Energy Savings Performance Agreement)
 - Alternative to more traditional energy upgrade financing (usually requiring property-tax administrator or utility company involvement)



- Financial innovation
 - Not just filling existing financing gap
 - **Creating a market for low-carbon financing instruments**

LC3: Further GIB potential in Canada

- Capacity Building
- LC3 (Low-Carbon Cities Canada) initiative
 - Develop TAF-like entities for major Canadian cities
 - Initial funding from federal government via Green Municipal Fund (GMF)
 - **Funding must be matched over a 10-year period**

Vancouver

Zero Emissions Innovation Centre (2021)
Independent non-profit organization
Endowed with \$21.7MM

Ottawa

Ottawa Climate Action Fund (2021)
Managed by the Ottawa Community Foundation
Endowed with \$21.7MM

Montreal

Greater Montreal Climate Fund (2020)
Independent non-profit
Endowed with \$32.5MM

Calgary & Edmonton

Climate Innovation Fund (2019)
Managed by Alberta Ecotrust Foundation
Endowed with \$43.4MM

Halifax

HCi3 (Halifax Climate Investment, Innovation and Impact) Fund (2021)
Independent non-profit
Subsidiary of EfficiencyOne (independent non-profit)
Endowed with \$17.7MM

Question on provincial GIBs

Is there a place for provincial level GIBs?

US GIBs typically at the state level

Australia and Germany (federal governance) at national level DFI (development financial institutions)

Canada has unique issues:

- Large provinces
- Isolated large cities

Provincial-level GIBs may be able to scale solutions across provinces

However,

- Focus across all municipalities, getting stretched thin, and failing to adequately address larger city municipalities
- Too much focus on city municipalities create perceptions of neglect for smaller municipalities

Bottom-up approach seems to be current arrangement with municipal level entities

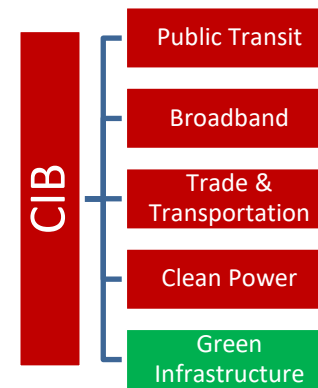
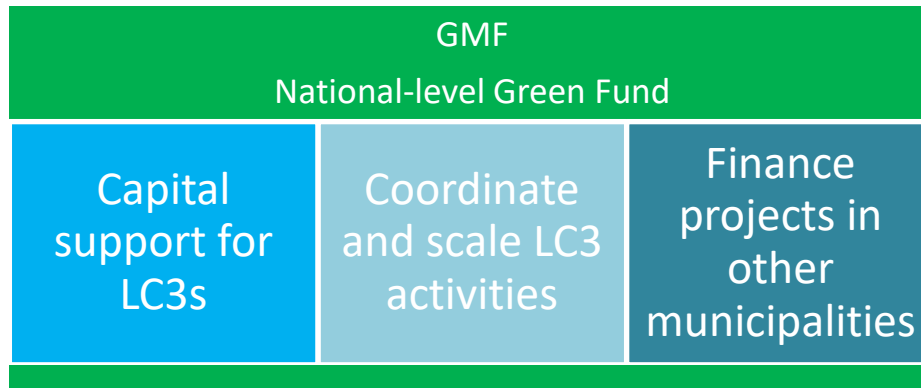
Added top-down approach from CIB (green infrastructure mandate)

Green Municipal Fund (GMF): GIB potential in Canada

- Value in federal-level GIB funding entity similar to what has been proposed in the US (National Climate Bank)
 - Funds projects, capital for government, and non-profit agencies' low-carbon action; funds state green banks
 - GMF as Canada's national green bank
- GMF
 - Established in 2000
 - Managed by the Federation of Canadian Municipalities (FCM) – Not-for-profit corporation
 - Capitalization
 - **\$1.6 billion (2000 – 2019) – Federal endowment**
 - Asset/Financing Vehicles
 - Grants
 - Loans
 - **Financed LC3 initial capital**

GMF: Recommendation

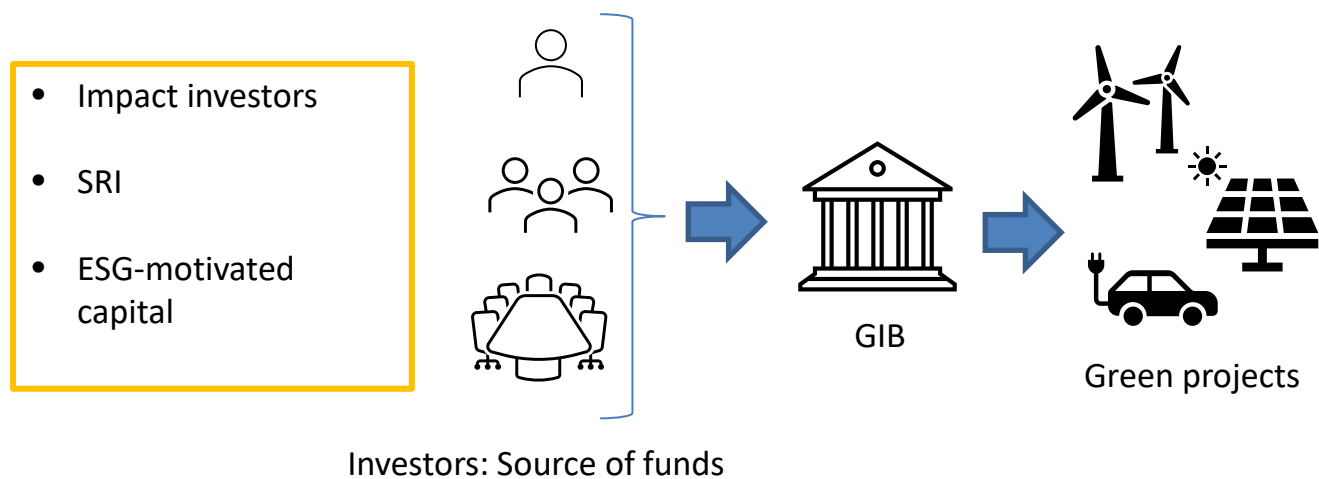
- Recommendation
 - Focus on financing LC3s/city-municipal GIBs
 - Finance projects in municipalities without GIBs (non-LC3 municipalities)
 - Focus on coordination, knowledge sharing, and activity scaling



- Coordinate project pipelines
 - Increase activity, reduce overlapping agendas
- Develop financing mechanisms
 - Understand sources of funds, destination of funds, and barriers between them

LC3 direction: Recommendation

- Capital market bridge
 - Bond issuances
 - Building coalitions with financial institutions
 - Sources of capital and destinations for capital



Conclusions: Addressing Canada's emissions

Key issues	Support required	Solutions being used in Canada
Policy uncertainty	Stable and committed policies	Federal level carbon pricing backstop Regulations on methane reduction Regulations on clean fuel production Regulations on zero-emissions vehicle production
Market failures	Pricing negative externalities (emissions pricing)	Federal level carbon pricing backstop Carbon tax schedule extended to 2030
Financing gaps	Financial innovation (that crowds-in private finance)	Mission-oriented organization Focused on low-carbon transformation TAF LC3 GMF

Conclusions: Embracing the GIB approach

- GIBs have become valuable instruments in the low-carbon financing space
- There is an existing precedent in Canada with TAF
- The LC3 initiative further presents an excellent opportunity to embrace the GIB model
- An area of focus should be on attracting private finance to the Canadian low-carbon financing space

Q & A