

Green Bonds 101 Workshop

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Agenda

- 1. Global Momentum to Invest in Climate Resilient/Green Infrastructure
- 2. Green Bonds and the Growth of the Market
 - 1. Global Market
 - 2. US Green Municipal Bond Market Growth
- 3. Market Rules: Green Bond Principles and the Climate Bonds Standard
 - 1. Green Bond Principles
 - 2. Climate Bonds Standard
- 4. Certification
- 5. Benefits of Green Bonds
- 6. Open Discussion



"All infrastructure has to now be green. And rivers of capital need to flow to assets and projects that are the *right* ones for the 2050 world we have to build."

> Christiana Figueres Former head, UNFCCC



Capital wants green

Investor demand Funds managers, mutuals. \$24th at UN Climate Summit in New York, 2014 foundations Insurance \$27tn \$30tn Insurers x10 climate investments by 2020 Sovereign \$6tn Pension \$30tn Developed by the following groups PRI Prestinent GLOBAL INVESTOR STATEMENT ON CLIMATE CHANGE This statement is signed by 404 investors representing more than US \$24 trillion in assets. NATA INVESTOR GROUP CLANATE CLANATE 9 DECEMBER 2015 We, the institutional investors that are signatories to this Statement, are acutely aware of the risks climate change presents to our investments. In addition, we recognise TRUMIN VESTURS REFRESENTING OUSPILE INLEIGH The Paris Green Bonds Statement FROM INVESTORS REPRESENTING US\$11.2 TRILLION we, the institutional investors that are signatories to trus state change presents to our investments. In addition, we recognise change presents to our investments, in addition, we recognise finance the transition to a low carbon economy and to enable Addenda Capital — Brian Minns, Sustainable We are particularly concerned that gaps, weaknesses and dela policies will increase the ricke to our investments as a result of Affirmative Investment Management — Stuart We are particularly concerned that Baps, weaknesses and dena policies will increase the risks to our investments as a result of investment in green bonds, climate POlicies will increase the risks to our investments as a result of will increase the likelihood that more radical policy measures v climate change. bonds and other bonds financing AllianceBernstein — Peter S. Kraus, Chairman will increase the inventiood that more radical policy measures y emissions. In turn, this could jeopardise the investments and re Kinnersley, CEO & Co-Founder mitigation of and adaptation to climate change that meet our risk and return We, the undersigned Allianz Global Investors - Franck Dixmier, There is a significant gap between the amount of capital that w signatories to this statement, requirements as institutional investors: Inere is a significant gap between the amount of capital that w a low carbon and climate resilient economy and the amount cur allow carbon and climate resilient economy along are approximately esi Amundi Asset Management — Bernard Carayon, Deprint CEO Global CIO Fixed Income a low carbon and climate resilient economy and the amount cur current investments in clean energy alone are approximately \$2 represent asset owners, Governments to act through Current investments in user energy arone are approximately actively arone the increase in global tempe investment managers and APG Asset Management — Herman Slooijer, policy, regulation, risk mitigation, esumated war minung we increase in global tempe ale remires average additional investments in clear individual funds managing a guarantees, tax credits and other Mru Masek Management — Herm. Managing Director Global Credits inianaging אופרנט סוטיסי גרפטויס AP1/Första AP-Fonden – Mikael Angberg, CIO mechanisms to support the issuance combined US\$11.2 trillion of des AP-Fonden – Ulrika Danielson, Head as investors

Green Bonds: The Basics



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Global Green Bond Market



Global development



Climate Bonds

Renewable Energy & Green Buildings dominate



US Green Municipal Bond Market

Top 5 US Municipal Green Bond Issuers

Climate Bonds



January 2018



Top 10 US Green Muni Issuers by State

Graph 1: Top 10 US Green Muni issuers ranked by cumulative issuance



Climate Bonds

Rules for green bond markets







Green definitions: Climate Bonds Standard



Climate Bonds Standard Criteria development





Eligible project & assets

1. Built water infrastructure projects and assets

Key features

- 1. Climate mitigation: eligible if either:
 - a. No emissions impact is expected
 - b. Emissions impact is expected, and the issuer has estimated the GHG mitigation impacts that will be delivered over the operational lifetime of the project or asset. This impact should be defined in terms of the decreased emissions or increased sequestration relative to a business as usual baseline.
- 2. Climate resilience: Issuers must have carried out a sufficient vulnerability assessment, and if necessary, prepared an appropriate management response plan to any climate risks identified therein. The Water Criteria contain a scorecard to check this.

Mara information at: https://www.climatohands.not/standard/wator



Eligible project & assets

- 1. Commercial buildings: Buildings must be in the top 15% of their city in terms of emissions performance. This "hurdle rate" in emissions terms ratchets down to zero (carbon) by 2050.
- Residential buildings: Existing instruments such as local building codes, energy rating schemes (e.g. US Energy Star) and energy labeling schemes (e.g. Energy Performance Certificates in the UK) are leveraged as proxies for the achievement of the 15% hurdle rate.
- 3. Upgrade projects: Building improvements that achieve emission reductions of 30% to 50% (depending on bond term) from a baseline will qualify for certification.

More information at: https://www.climatebonds.net/standard/buildings

limate Bonds

Network of licensed verifiers



Certification

Prepare the bond

- Identify assets that meet the relevant sector criteria and compile supporting information
- Create Green
 Bond Framework
 setting out how
 proceeds of the
 bond will be used

Engage a verifier

- Engage an Approved Verifier for pre- and post-issuance Certification
- Provide them with relevant information
- Receive a Verifier's Report giving assurance that Climate Bonds Standard requirements are met

Get Certified & issue a Certified Climate Bond

- Submit the Verifier's Report and Infomation Form to the Climate Bonds Initiative
- Receive a decision on preissuance Certification
- Issue your bond, using the Certified Climate Bond mark

Confirm the Certification post-issuance

- Within 12 months of issuance, submit the Verifiers post-issuance report
- Receive notification of post-issuance certification

Climate Bonds

Report annually

- Prepare a simple report each year for term of the bond
- Provide it to bond holders and Climate Bonds Initiative

Green Bond Benefits

- Reputation Benefits good publicity
- Environmental Attributes improved air and water quality
- First Mover Advantage recognition for being a leader



Green Bond Economic Benefits

- Growing Number of Responsible Investors Increasing Demand
- Specialty Bond Market Limited Supply
- Potential Lower Cost of Capital Pricing Premium (2 to 6 basis points)





- The Climate Bonds Standard follows the GBPs?
 a) True/False
 - To be certified under the Climate Bonds Standard 2.1 a bond must verified
 - a) Before issuance; After; Both; Not at all
 - Could your project be financed by green bonds?
 a) Let's find out!



THE GREEN BOND PLEDGE

The **Green Bond Pledge** is a simple declaration with broad and far-reaching impact. All bonds that finance longterm infrastructure and capital projects need to address environmental impact and climate risk. Green bonds contribute to beneficial environmental and climate outcomes and signal that these imperatives have been deliberately incorporated into the planning and deployment of infrastructure projects.

greenbondpledge.com

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Case Study – DC Water Green Bond

Issued \$350 million labelled Green Bond in 2014, 100 million issued in 2017

For the District of Columbia Water and Sewer Authority—commonly referred to as DC Water—the decision to issue a green bond started with the Clean Rivers project, which they were in the process of financing.

They were considering issuing a normal bond, but when CFO Mark Kim and his team looked at the characteristics of the asset and realized all its potential positive environmental outcomes, they thought it would more appropriate to finance the project with green bonds.

The environmental outcomes of the project were identified as:

Improving water quality

Improving climate resilience (climate change adaptation: flood relief/mitigation)

Improving quality of life (facilitate recreational river use from waterway restoration; biodiversity improvement from nitrogen and phosphorus removal)



Case Study – City of Lawrence, Kansas

Issued \$11.3 million labeled Green Bond in 2017

The City of Lawrence issued green bonds to finance a citywide energy efficiency retrofit program in 40+ city facilities.

"The energy efficiency retrofit project is part of the state of Kansas Facilities Conservation Improvement Program (FCIP) a state program for performance contracts for public entities. In performance contracts, the energy savings are quantified, and the savings guaranteed. The City of Lawrence will save \$450,000 in avoided energy costs each year for the 20 year life of the project, and these annual savings will be used to finance the bond payments."

While there is good disclosure of each project and the funds attributed to each, there is no information stating how these projects were selected.



Case Study – East Bay Municipal Utility District

Issued \$74 million labeled Green Bond

Offering documents clearly describe the eligibility criteria, anticipated financial tracking of proceeds and reporting

However – Green Bond and Projects are explicitly undefined!

"The terms 'green bonds' and 'green project' are neither defined in nor related to provisions in the Indenture. The use of such terms herein is for identification purposes only and is not intended to provide or imply that an owner of the Series 2015B Bonds is entitled to any additional security other than as provided in the Indenture. The purpose of labeling the Series 201B Bonds as "green bonds" is, as noted, to allow owners of the Series 2015B Bonds to invest directly in bonds that will finance environmentally beneficial projects. The District assumes no obligation to ensure that these projects comply with the principles of green projects as such principles may hereafter evolve."

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Eligible project & assets

- 1. Public passenger transport e.g. rail, metros, trams, electric/hybrid buses, bicycle schemes
- 2. Private light-duty and heavy goods vehicles that are electric, hybrid or alternative fuel
- 3. Dedicated freight railway lines and supporting infrastructure e.g. IT upgrades, signalling, communication technologies, charging infrastructure

Key features

- CO₂ emission thresholds on a per passenger per kilometre (p/km), for passenger transport, and a per tonne per kilometre, for freight transport, basis
- 2. Emission thresholds decrease over time in-line with transport sector emission reductions required to meet 2° C global warming targets
- 3. Thresholds are based in the global stock-wide average of emissions accounted for in the International Energy Agency's 2 Degree



Eligible project & assets

- 1. The development, construction and operation of wind farms
- 2. Operational production or manufacturing facilities wholly dedicated to wind energy development
- 3. Wholly dedicated transmission infrastructure for wind farms.

More information at: https://www.climatebonds.net/standard/wind





Eligible projects and assets

- 1. Solar electricity generation facilities
- 2. Wholly dedicated transmission infrastructure and other supporting infrastructure for solar electricity generation facilities including inverters, transformers, energy storage systems and control systems
- 3. Solar thermal facilities such as solar hot water systems.

Eligible Project & Assets shall have a minimum of 85% of electricity generated from solar energy resources (i.e. no more than 15% of electricity generated can be from fossil fuel back-up).

More information at: https://www.climatebonds.net/standard/solar Climate Bonds



Eligible project & assets

- New and existing geothermal projects with direct emissions of less than 100gCO₂/kWh
- 2. Geothermal projects with mitigation technologies that will render the non-condensable gas releases to the atmosphere negligible
- 3. Geothermal projects that have been reviewed and registered under the Clean Development Mechanism

More information at: https://www.climatebonds.net/standard/geothermal



Requirements of Climate Bonds Standard V2.1

These requirements are designed to ensure that the Issuer has established appropriate internal processes, controls and reporting procedures. They are additional to meeting the requirements of the relevant Sector Criteria

Pre-issuance requirements:

- 1. Selection of nominated projects & assets
- Internal processes & controls for tracking of proceeds, managing unallocated proceeds and earmarking funds to nominated projects and assets
- 3. Reporting prior to issuance

Post-issuance requirements:

- 1. Nominated projects & assets
- 2. Use of proceeds
- 3. Non-contamination of proceeds
- 4. Annual reporting

More information at

Green Municipal Bond Issuances

Highlights of U.S. Muni/Gov. Green Bonds over 2017

Agency	Date Issued / Anticipated	Value
LA Metro	Sept 2017	\$550M
NY MTA	Sept 2017	\$662M
City of Greensboro	August 2017	\$29M
FANNIE MAE	August 2017	\$873M
NY MTA	June 2017	\$312M
State of Connecticut	June 2017	\$250M
City of Long Beach, California	June 2017	\$26M
BART San Francisco	May 2017	\$388M
Commonwealth of Massachusetts	April 2017	\$100M
Massachusetts Clean Water Trust	April 2017	\$207M

