Green Bonds 101 Workshop

Aneil Tripathy, Climate Bonds Initiative
Phillip Ludvigsen, First Environment

April 30, 2018
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

$24tn at UN Climate Summit in New York, 2014

Insurers x10 climate investments by 2020

GLOBAL INVESTOR STATEMENT ON CLIMATE CHANGE

This statement is signed by 404 investors representing more than US $24 trillion in assets.

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 the need to change the transition to a low carbon economy and to enable climate change.

We are particularly concerned that gaps, weaknesses and dose policies will increase the risks to our investments as a result of climate change. We will increase the likelihood that more radical policy measures are required. In turn, this could jeopardise the investments and returns.

There is a significant gap between the amount of capital that is low carbon and climate resilient economy and the amount the current investments in clean energy alone are approximately $2.5 trillion has estimated that limiting the increase in global temperature to 1.5°C requires additional investments in clean energy of $800 billion annually. It is necessary to address this gap and increase the amount of capital that is low carbon and climate resilient economy.

We, the undersigned signatories to this statement, represent asset owners, investment managers and individual funds managing a combined US $1.2 trillion of assets. We encourage, in order to scale up investment in green bonds, climate bonds and other bonds financing mitigation of and adaptation to climate change that meet our risk and return requirements, as institutional investors:

1. Governments to act through policy, regulation, risk mitigation, guarantees, tax credits and other mechanisms to support the issuance of green bonds and that both address climate risks.

FROM INVESTORS REPRESENTING US $1.2 TRILLION

The Paris Green Bonds Statement

9 DECEMBER 2015

SIGNATORIES

ACTIAM — Jacob de WA, CEO
Addenda Capital — Brian Mwiu, Sustainable Investing Specialist
Affirmative Investment Management — Stuart Kinnear, CEO & Co-Founder
AllianceBernstein — Peter S. Kraus, Chairman and CEO
Allianz Global Investors — Frank Dieterle, Global CIO Fixed Income
Amundi Asset Management — Bernard Cazeneuve, Deputy CEO
AP6 Asset Management — Herman Støjvæl, Managing Director Global Credits
API/FirstAP Fonden — Mikael Ångqvist, CIO
APF/FirstAP Fonden — Ulrika Danielsson, Head of Research and Analysis

Developed by the following groups

IIGCC, PRI, IFM, CDP, NAPLES, ACC, ARIA, ICMA, IMDA, AIGCC, ACRIA
Green Bonds: The Basics

**Proceeds to Green**
- Bonds that finance projects that provide environmental or climate change benefits

**Any entity**
- Governments & Development Banks
- Corporates
- Asset owners: Banks, utilities, etc

**Reporting**
- Substantive green criteria
- Independent review
- Reporting on use of proceeds
Global development

- **Top 10 countries ($>6.5bn)**
  - Spain $10.2bn
  - France $43.8bn
  - Netherlands $14.6bn
  - Sweden $12.9bn
  - Germany $25.9bn
  - Norway $4.6bn
  - Belgium $5.6bn
  - Italy $5.9bn
  - China $48.8bn
  - India $6.6bn
  - United States $82.6bn
  - Canada $8.4bn
  - Mexico $6.7bn
  - Japan $6.1bn
  - Australia $4.7bn

- **Supranational** $55.1bn

**Legend:**
- Dark blue: Top 10 countries ($>6.5bn)
- Green: $1-6.5bn
- Light green: <$1bn

**Source:** Climate Bonds Initiative
Renewable Energy & Green Buildings dominate

Low carbon buildings up x2.4
US Green Municipal Bond Market

Top 5 US Municipal Green Bond Issuers

- New York MTA
- Central Puget Sound Transit Authority
- Massachusetts Water Resources Authority
- San Francisco Public Utilities
- California Health Facilities Financing Authority (Kaiser Foundation Hospitals)
- Other States

January 2018
Top 10 US Green Muni Issuers by State

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

[Bar chart showing the top 10 US Municipal States Green Bond Issuance from January 2018]
Rules for green bond markets
Four Pillars of Green Bond Principles

1. Use of Proceeds
2. Project Selection
3. Management of Proceeds
4. Reporting / Assurance
## Green definitions: Climate Bonds Standard

<table>
<thead>
<tr>
<th>Energy</th>
<th>Transport</th>
<th>Water</th>
<th>Low Carbon Buildings</th>
<th>Information Technology &amp; Communications</th>
<th>Waste &amp; Pollution Control</th>
<th>Nature Based Assets</th>
<th>Industry &amp; Energy-intensive Commercial</th>
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</thead>
<tbody>
<tr>
<td>Solar</td>
<td>Rail</td>
<td>Built (grey)</td>
<td>Residential</td>
<td>Power management</td>
<td>Recycling facilities</td>
<td>Agricultural land</td>
<td>Manufacturing</td>
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<tr>
<td>Wind</td>
<td>Vehicles</td>
<td>Green and hybrid</td>
<td>Commercial</td>
<td>Broadband</td>
<td>Recycled products &amp;</td>
<td>Forests (managed and unmanaged)</td>
<td>Energy efficiency processes</td>
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<td>Geothermal</td>
<td>Mass transit</td>
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<td>Retrofit</td>
<td>Resource efficiency</td>
<td>&amp; circular economy</td>
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<td>Energy efficiency products</td>
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<td>Hydropower</td>
<td>Bus rapid transport</td>
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<td>Products for</td>
<td>Teleconferencing</td>
<td>Waste to energy</td>
<td></td>
<td>Energy efficiency products</td>
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<td>Bionergy</td>
<td>Water-borne transport</td>
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<td>building carbon</td>
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<td>Methane management</td>
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<td>Energy efficiency products</td>
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<td>Marine Renewable Energy</td>
<td>Alternative fuel Infrastructure</td>
<td></td>
<td>efficiency</td>
<td></td>
<td>Geosequestration</td>
<td></td>
<td>Energy efficiency products</td>
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<tr>
<td>Energy distribution &amp; management</td>
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<td>Data centres</td>
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<td>Dedicated transmission</td>
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<td>Process &amp; fugitive emissions</td>
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<td></td>
<td></td>
<td></td>
<td>Energy efficient appliances</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Combined heat &amp; power</td>
</tr>
</tbody>
</table>

Certification Criteria approved
Criteria under development
Due to commence
### Climate Bonds Standard Criteria development

<table>
<thead>
<tr>
<th>Category</th>
<th>Can be certified now</th>
<th>Criteria in development</th>
<th>TWGs launching soon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>Wind, Solar, Geothermal, Hydro, Bio, Marine, Distribution &amp; Management</td>
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</tr>
<tr>
<td>Transport</td>
<td>Rail, Vehicles, Bus/Rapid Transit, Water Transport</td>
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<tr>
<td>Utilities</td>
<td>Water, Recycling &amp; Reuse, Disposal, IT, Communications</td>
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<tr>
<td>Buildings</td>
<td>Residential, Commercial</td>
<td>Forestry, Agriculture, Fisheries</td>
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</tr>
<tr>
<td>Natural Resources</td>
<td>Forestry, Agriculture, Fisheries</td>
<td>Cement, Steel, Manufacturing &amp; Processing</td>
<td></td>
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<tr>
<td>Industry</td>
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</tbody>
</table>
Water Criteria

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.

More information at: https://www.climatebonds.net/standard/water
Buildings Criteria

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.

2. 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
Network of licensed verifiers

- Must have relevant expertise + ISAE 3000
- Training program
- Quality reviews
- Annual license

Worldwide

China only

- 中财绿融
  - Zhongcai Green Financing
- 中诚信国际
  - CCXI
- 联合赤道
  - China Lianhe Equator
- 瑞景通途
  - Make Green Achievable
- 商道融绿
  - SynTao Green Finance

- KPMG
- FIRST ENVIRONMENT
- vigeo eiris
- NSF
- EY
- pwc
- SUSTAINALYTICS
- Deloitte
- DNV GL
- EPIC Sustainability
- Climate Bonds
Certification

1. 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

2. 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

3. Get Certified & issue a Certified Climate Bond
   - Submit the Verifier’s Report and Information Form to the Climate Bonds Initiative
   - Receive a decision on pre-issuance Certification
   - Issue your bond, using the Certified Climate Bond mark

4. Confirm the Certification post-issuance
   - Within 12 months of issuance, submit the Verifiers post-issuance report
   - Receive notification of post-issuance certification

5. 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)
Q/A

• 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 long-term 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

FOLLOW US ON SOCIAL MEDIA

Climate Bonds
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.”
Transport Criteria

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
1. 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 Scenario mobility model

More information at: https://www.climatebonds.net/standard/transport
Wind Criteria

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
Solar Criteria

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
Geothermal Criteria

Eligible project & assets
1. 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
2. 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: https://www.climatebonds.net/standards/standard_download
## Green Municipal Bond Issuances

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

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