A Deeper Blue for Green Bonds: 
Water Investment Criteria for Nature-based Solutions

June 14, 2018

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Justine Leigh-Bell, Climate Bonds Initiative
Mike Brown, San Francisco Public Utilities Commission
John Matthews, PhD, Alliance for Global Water Adaptation
Webinar Logistics

• Everyone is in listen-only mode

• You can type a **question** at any point into the chat box on the bottom left OR “raise your hand” and the Chairperson will reply

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Agenda and Speakers

Robin Miller, Ceres

Justine Leigh-Bell
Climate Bonds Initiative

Michael Brown
San Francisco Public Utilities Commission

John Matthews, PhD
Alliance for Global Water Adaptation
Ceres Investor Water Hub Speaker Series

• A working group under Ceres’ Investor Network dedicated to developing more effective research methods to assess water risks and opportunities

• 90+ institutional investors

• Investor Water Toolkit

For more information about the Investor Water Hub or to suggest a Speaker Series topic/expert, please contact Robin Miller at miller@ceres.org
Water Consortium
Green Bonds: The Importance of Standards

Justine Leigh-Bell, Director

*Climate Bonds Initiative*
The Climate Bonds Initiative – what we do

We are an investor-focused not-for-profit mobilising debt capital markets for climate solutions:

• Outreach to inform and stimulate the market
  - Policy models and government advice
  - Efforts in emerging markets to grow issuance
  - Green innovations e.g. securitization, covered bonds, Islamic Finance

• Market data and analysis
  - Green bonds data base, feeding MSCI/Barclays and S&P DJI indices
  - State of the Market report, commissioned by HSBC
  - Regional and thematic focus reports, e.g. China, Canada

• Climate Bonds Standard & Certification Scheme
  - Definitions for investors and guidelines for bond issuers
  - Assurance through certification
Investor demand driving Green Bond growth

USD155.5bn total green bond issuance 2017;

Over1500 green bond issues;

78% growth on 2016

37 countries from all continents;

239 different issuers;

146 new issuers
A Global Story

- **Supranational**: $55.1bn
- **United States**: $82.6bn
- **Canada**: $8.4bn
- **Mexico**: $6.7bn
- **Spain**: $10.2bn
- **France**: $43.8bn
- **Netherlands**: $14.6bn
- **Sweden**: $12.9bn
- **Germany**: $25.9bn
- **Norway**: $4.6bn
- **Belgium**: $5.6bn
- **Italy**: $5.9bn
- **India**: $6.6bn
- **China**: $48.8bn
- **Japan**: $6.1bn
- **Australia**: $4.7bn

Legend:
- Top 10 countries (> $6.5bn)
- $1-6.5bn
- <$1bn
Markets rules to scale

GBPs and CBS drove early market growth, allowed global consistency

- Transparency
- Reporting protocols
- Green definitions
- Independent review

China’s regulations & definitions fast tracked a market

France and now EU taxonomy & green labels regulation

Verifiers supervision: China, EU, Hong Kong, Mexico
The Climate Bonds Standard & Certification Scheme

• The Climate Bonds Standard and Certification Scheme is a *Fair Trade-like* labelling scheme for bonds. It is designed as an easy-to-use screening tool for investors and issuers to assist them in prioritising investments that truly contribute to addressing climate change.

• The Climate Bonds Standard is made up of two parts:

  1. Climate Bonds Standard V2.1 details management and reporting processes

  2. Sector specific Criteria detail the requirements assets must meet to be eligible for Climate Bonds Certification
Climate Bonds Taxonomy

<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>
</tr>
</thead>
<tbody>
<tr>
<td>Solar</td>
<td>Rail</td>
<td>Built (grey) infrastructure</td>
<td>Residential</td>
<td>Power management</td>
<td>Recycling</td>
<td>Agricultural land</td>
<td>Manufacturing</td>
</tr>
<tr>
<td>Wind</td>
<td>Vehicles</td>
<td>Commercial</td>
<td>Broadband</td>
<td>Other Recovery</td>
<td>Forests (managed and unmanaged)</td>
<td>Energy efficiency processes</td>
<td>Energy efficiency products</td>
</tr>
<tr>
<td>Geothermal</td>
<td>Mass transit</td>
<td>Retrofit</td>
<td>Resource efficiency</td>
<td>Disposal</td>
<td>Wetlands</td>
<td>Energy efficiency products</td>
<td>Retail and wholesale</td>
</tr>
<tr>
<td>Hydropower</td>
<td>Bus rapid transport</td>
<td>Products for building carbon efficiency</td>
<td>Teleconferencing</td>
<td>Prevention</td>
<td>Degraded Lands</td>
<td>Data centres</td>
<td>Process &amp; fugitive emissions</td>
</tr>
<tr>
<td>Bioenergy</td>
<td>Water-bourne transport</td>
<td>Alternative fuel Infrastructure</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Wave and Tidal</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy distribution &amp; management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dedicated transmission</td>
<td></td>
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</tr>
</tbody>
</table>

Certification Criteria approved
Criteria under development
Due to commence

AGWA CDP Ceres Climate Bonds World Resources Institute
**Climate Bonds Standard Sector Criteria Development Process**

1. **CBI preparation**
   - Background research
   - Recruitment of TWG members

2. **TWG meetings**
   - Monthly meetings to discuss issues and draft scientifically robust eligibility Criteria for bioenergy assets and projects

3. **IWG meetings**
   - Monthly meetings to provide feedback on approach and draft Criteria: Are they feasible and practical for issuers and verifiers?

4. **Board approval**
   - Final refinements to Criteria if needed

5. **Public consultation**
   - Release to the market
How to get a bond Climate Bond Certified?

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.

See all Certified Climate Bonds at: https://www.climatebonds.net/standards/certification
San Francisco Public Utilities Commission

A Deeper Blue for Green Bonds: Water Investment Criteria for Nature-based Solutions

Michael Brown
Environmental Finance Manager

June 14, 2018
### SFPUC Overview:
**Over $1B Green Bonds Issued**

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Water Enterprise</th>
<th>Wastewater Enterprise</th>
<th>Power Enterprise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides drinking water to SF residents / businesses (Retail) &amp; 27 agencies in Alameda, Santa Clara and San Mateo Counties (Wholesale)</td>
<td>Operates combined sewage and stormwater collection and treatment system serving SF residents/businesses</td>
<td>Provides hydroelectric energy primarily to City municipal services &amp; customers, plus certain retail customers</td>
<td></td>
</tr>
<tr>
<td>Service Area Population</td>
<td>2,700,000</td>
<td>865,000</td>
<td></td>
</tr>
<tr>
<td>FY17 Revenues</td>
<td>$460 million</td>
<td>$277 million</td>
<td>$121 million</td>
</tr>
<tr>
<td>10-Year Capital Program</td>
<td>$2.1 billion</td>
<td>$5.6 billion</td>
<td>$797 million</td>
</tr>
<tr>
<td>Bond Ratings</td>
<td>AA-/S&amp;P</td>
<td>AA/S&amp;P</td>
<td>AA-/Fitch</td>
</tr>
<tr>
<td>Outstanding Debt</td>
<td>$4.52B</td>
<td>$937.3M</td>
<td>$38.8M</td>
</tr>
<tr>
<td>Green Bonds</td>
<td>$765.1M*</td>
<td>$240.6M*</td>
<td>$32.0M</td>
</tr>
</tbody>
</table>

*CBI Certified Green Bonds
Wastewater Capital Program (SSIP) Received Programmatic Green Bond Approval

SSIP Phase 1 $3B
80+ Projects
Dedicated Green Infrastructure
8 Projects, $57M

Chinatown
Green Alley
North Shore Watershed

Wiggle
Neighborhood
Green Corridor
Channel Watershed

Mission & Valencia
Streets Green Gateway
Islais Creek Watershed

Upper Yosemite
Creek Daylighting
Yosemite Watershed

Visitacion Valley
Green Nodes
Sunnydale Watershed
# Green Bonds Opportunity for Muni Issuers

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
<th>Muni Green Bonds Opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expand investor base</td>
<td>Time and expense for certification</td>
<td>With pricing advantage muni issuers will enter market in greater numbers</td>
</tr>
<tr>
<td>Marketing and PR benefits</td>
<td>Ongoing reporting Requirements</td>
<td>Lower borrowing costs can influence project and technology selection, leading to more green projects</td>
</tr>
<tr>
<td>Reputational benefits</td>
<td>Liability concerns</td>
<td></td>
</tr>
<tr>
<td>Rewarded if already taking climate change into account</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential for lower cost of borrowing, especially with taxable bonds</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Climate Bonds Standard Water Criteria: Nature-Based and Hybrid Water Infrastructure

John Matthews, Alliance for Global Water Adaptation (AGWA)

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Alliance4Water.org
AGWAGuide.org

Lily Dai, Climate Bonds Initiative

14 June 2018
Climate Bonds Standard Water Criteria
Climate Bonds Standard Water Criteria

Phase 1 Engineered water infrastructure – released
Covers engineered water infrastructure for water collection, storage, treatment or distribution, or for flood protection or drought resilience.

Released to the market in October 2016.

Three bonds were certified to date.

Phase 2 Nature-based and hybrid water infrastructure – open for public consultation
Extends the Water Criteria to incorporate nature-based solutions, which includes green and hybrid water infrastructure for water collection, storage, treatment or distribution, flood protection, and drought resilience.

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Phase 1 TWG Meeting</td>
<td>Nov 2014</td>
</tr>
<tr>
<td>Phase 1 Public Consultation</td>
<td>Nov 2015</td>
</tr>
<tr>
<td>First Phase 2 TWG Meeting</td>
<td>May 2016</td>
</tr>
<tr>
<td>Phase 1 Release</td>
<td>Oct 2016</td>
</tr>
<tr>
<td>Phase 2 Public Consultation</td>
<td>Oct 2017</td>
</tr>
</tbody>
</table>
## Climate Bonds Standard Water Criteria Phase 2

<table>
<thead>
<tr>
<th>Assets</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water storage such as snowpack runoff and groundwater recharge systems</strong></td>
<td>Active snowpack management program; Using parks, natural areas for storm water management; Creating groundwater recharge areas for aquifer storage</td>
</tr>
<tr>
<td><strong>Flood defences</strong></td>
<td>Restoration of riparian wetlands for flood storage; Creation of safe delta flood zones as natural habitat for the river to expand into; Altering flow mechanics to reduce the force of flood stage flows</td>
</tr>
<tr>
<td><strong>Drought defences</strong></td>
<td>Use of pumps to transfer waters to / from natural aquifers; Planting trees, other vegetation explicitly to reduce water temperatures, evaporation rates</td>
</tr>
<tr>
<td><strong>Water treatment</strong></td>
<td>Construction of nature-based wetland using native plants for water filtration, nutrient management</td>
</tr>
<tr>
<td><strong>Storm water management</strong></td>
<td>Removal of pavement, creation of new substrate to improve groundwater absorption &amp; reduce runoff; Creation of wetland retention ponds</td>
</tr>
<tr>
<td><strong>Ecological restoration / management</strong></td>
<td>Development of an environmental flows regime; Sediment transport to reduce / restore downstream deposition</td>
</tr>
</tbody>
</table>
Examples of nature-based solutions

Aquifer storage

“room for the river”
Will your project meet the Water Criteria? It’s an easy two-step process:

**STEP 1**
Comply with Mitigation Component

GHG emissions from water projects do not increase and comply with business-as-usual baseline or aim at emission reduction will be delivered over the operational lifetime of the water asset or project.

**STEP 2**
Comply with Adaptation & Resilience Component

Water infrastructure and its surrounding ecosystem are resilient to climate change, and have sufficient adaptation to address climate change risks.

To demonstrate that, issuers should complete a scorecard made up of five sections:

- **Section 1. Allocation**: Addressing how water is shared by users within a given basin or aquifer.
- **Section 2. Governance**: Addressing how/whether water will be formally shared, negotiated, and governed.
- **Section 3. Technical Diagnostics**: How/whether changes to the hydrologic system are addressed over time.
- **Section 4. Nature-based Solutions**: (for nature-based and hybrid infrastructure only) addressing whether issuers have sufficient understanding of ecological impacts at/beyond project site with ongoing monitoring and management capacity.
- **Section 5. Assessment of the Adaptation Plan**: Checking the completeness of the coping mechanisms to address identified climate vulnerabilities.
Climate Bonds Standard Water Criteria Phase 2

Context

• Water has a deep connection to carbon emissions and can contribute to accelerating or mitigating climate change. For instance, water treatment such as effluent treatment and desalinization can be especially ‘thirsty’ for energy.

• Therefore, efforts to reduce the energy consumed and/or the amount of water treated or moved can all have very significant impacts on greenhouse gas emissions.

Requirements

• No emissions impact (positive or negative) is expected, and the issuer discloses the justification for this decision with supporting documentation; or

• Negative GHG emissions impact is expected, and the issuer has estimated the GHG mitigation impact 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.
Climate Bonds Standard Water Criteria Phase 2

Context

• Climate change presents significant challenges for water management, not least because of the diverse and multiple demands made upon freshwater resources, and changing hydrological conditions due to climate change. The nature, scale and timing of these evolutions is highly uncertain.

• To ensure an effective adaptation of existing system or building resilient new systems is essential given the fundamental basis of water in modern economies.

Requirements (for projects with > 20 years operational life time)

• Vulnerability assessment: an assessment of climate risks to find whether climate change will significantly impact the project or asset

• Adaptation plan: if significant climate risks are identified, the issuer need to supply a corresponding Adaptation Plan - a management response plan address climate risks.
Eligibility for certification depends on the efficacy and thoroughness of the issuer’s Vulnerability Assessment and Adaptation Plan, and the underlying climate risk assessment and management plans that they capture. This is assessed via a **Scorecard**, or checklist, consisting of a series of binary questions.

Section 1, 2, 3, and 5 should be completed for all water infrastructure projects, whereas section 4 should only be completed for nature-based and hybrid water infrastructure.

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**Section 1. Allocation:** Addressing how water is shared by users within a given basin or aquifer.

**Section 2. Governance:** Addressing how/whether water will be formally shared, negotiated, and governed.

**Section 3. Technical Diagnostics:** How/whether changes to the hydrologic system are addressed over time.

**Section 4. Nature-based Solutions:** (for nature-based and hybrid infrastructure only) addressing whether issuers have sufficient understanding of ecological impacts at/beyond project site with ongoing monitoring and management capacity.

**Section 5. Assessment of the Adaptation Plan:** Checking the completeness of the coping mechanisms to address identified climate vulnerabilities.
Nature-based solution issuances must meet two basic ground rules before proceeding with relevant criteria.

A. It reflects the intentional use of natural and/or nature-based features, processes, and functions (see Section 1) as an integral part of addressing a human need and doing so in a manner that protects, manages, restores, and/or enhances natural features, processes, and systems in a functioning and sustainable manner.

B. Where feasible, the project prioritises natural features over nature-based features. Such features include the protection, restoration, expansion, and/or creation of natural systems and processes as an explicit component of the desired project outcomes.
Climate Bonds Standard Water Criteria Phase 2

Section 1: Allocation

e.g. Are there accountability mechanisms in place for the management of water allocation that are effective at a sub-basin and/or basin scale?

Section 2: Governance

e.g. Have water entitlements been defined according to one of the following: Purpose that water may be used for; Maximum area that may be irrigated; Maximum volume that may be taken in a nominated period; Proportion of any water allocated to a defined resource pool.

Section 3: Technical Diagnostics

e.g. Does a water resources model of the proposed investment and ecosystem (or proposed modifications to existing investment and ecosystem) exist?

Specify model types, such as WEAP, SWAT, RIBASIM, USACE applications). Scale should be at least sub-basin.
Climate Bonds Standard Water Criteria Phase 2

Section 4: Nature-based Solutions

• **Site inventory:** How well do we understand the systems and processes at the project site?

• **Ecological baselines for management:** Do we understand how the ecological characteristics of the site will evolve over time?

• **Data inventories for localized & indigenous assets:** Do we have access to adequate, credible data about the project site?

• **Broader ecosystem impacts:** Do we understand how the project’s impacts may extend beyond the site?

• **Monitoring & management systems:** Do we have effective management processes and tools to maintain ecological integrity over time?
Climate Bonds Standard Water Criteria Phase 2

Section 5: Adaptation plan

• Is there a plan to restore or secure lost/modified ecosystem functions/species?

• Is the adaptation plan for environmental targets / infrastructure robust across specified observed / recent climate conditions?

• Is the adaptation plan for environmental targets / infrastructure robust across specified projected climate conditions?

• Is there a monitoring plan designed to track ongoing progress and impacts to inform future decisions?

• Is there a plan to reconsider on a periodic basis the VA for operational parameters, governance and allocation shifts, and environmental performance targets?
Climate Bonds Standard Water Criteria Phase 2

Scoring
For each question in the scorecard, a ‘yes’ or ‘n/a’ response scores 1 point, a ‘no’ scores 0. To meet the requirements of the Climate Bonds Standard Adaptation and Resilience component:

The project must score at least 60% of the maximum potential score in all parts of the Scorecard. (That is, must score >= 60% for Allocation, >=60% for Governance, >= 60% for Technical Diagnostics, >= 60% for each subsection of Nature-Based Solutions, and >= 60% in the Adaptation Plan Assessment)

Assessment and verification
It is the issuers’ responsibility to self-assess and self-score against the Scorecard the project or asset being funded by the bond proceeds in the first instance. Verifiers are required to check this using the information and evidence provided to them by the issuers.
How to learn more

https://climatebonds.net/standard/water

Interview with Anna Creed, CBI

https://en.unesco.org/courier/
Join AGWA!
http://alliance4water.org
http://AGWAguide.org

MANY THANKS

john matthews • johoma@alliance4water.org
QUESTIONS
# Green Bond Pledge

## Issuers

- **Commit** to incorporate resilience & mitigation into infrastructure and other capital projects
- **Agree** that all infrastructure and capital projects will need to be climate resilient and where relevant, support the reduction of GHG emissions
- **Welcome** the role that green bonds can play in helping to achieve the financing of that infrastructure
- **Support** the rapid growth of a green bonds market
- **Pledge** to establish a green bonds strategy

## Investors

- **Sign** an investor statement supporting the pledge and investments in a low carbon economy
- **Recognize** that the growth of the international green bonds market provides a useful mechanism to finance solutions to climate change
- **Believe** that green bonds and other green asset classes represent an investment opportunity
- **Support** the continued development of this market

https://www.greenbondpledge.com/
Thank You!

For more information:

https://www.climatebonds.net/standard/water