



Presentation from
**2016 World Water
Week in Stockholm**

www.worldwaterweek.org

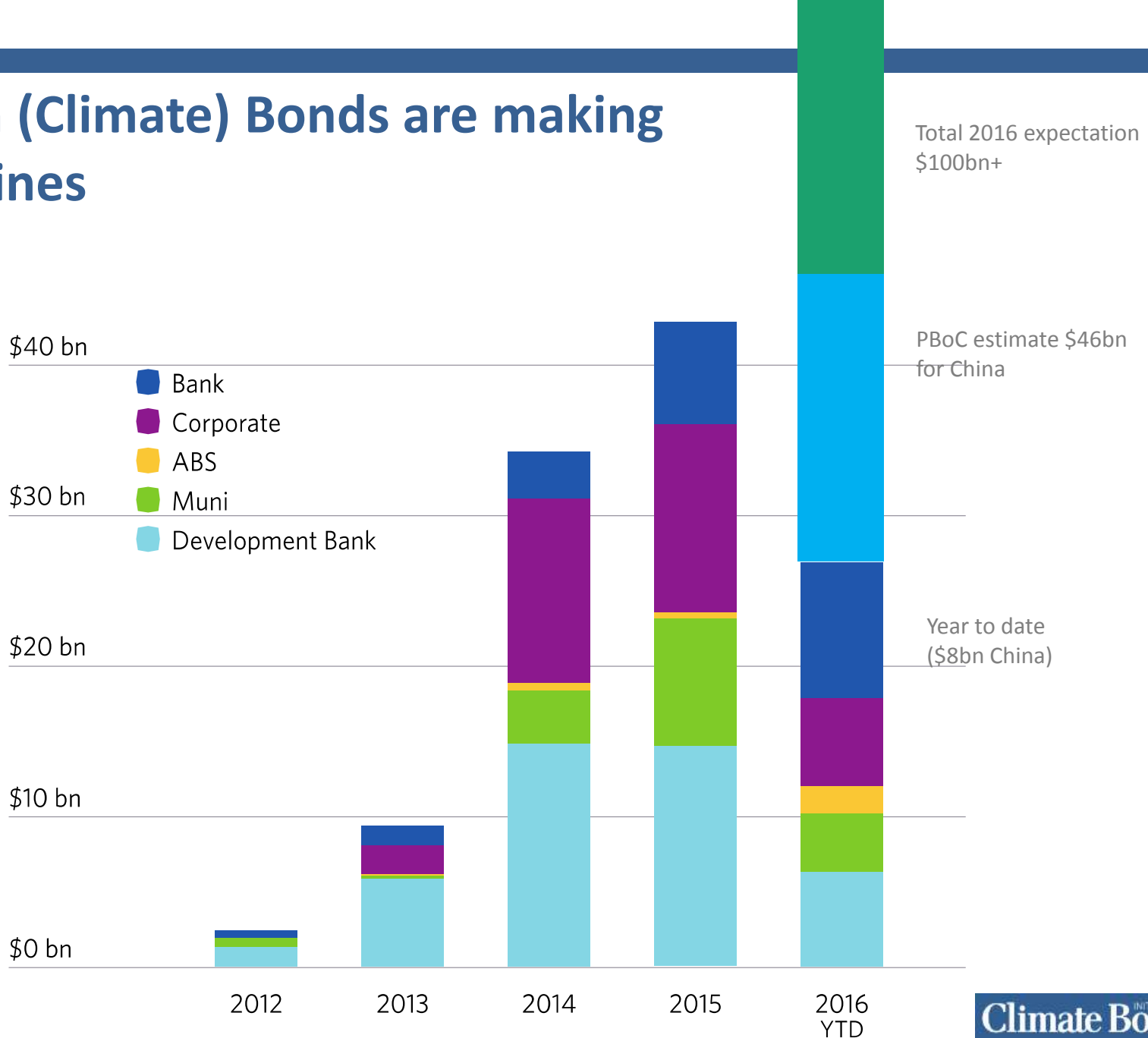
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Leveraging Climate Bonds for Integrating Nature Based Solutions in Investment Portfolios

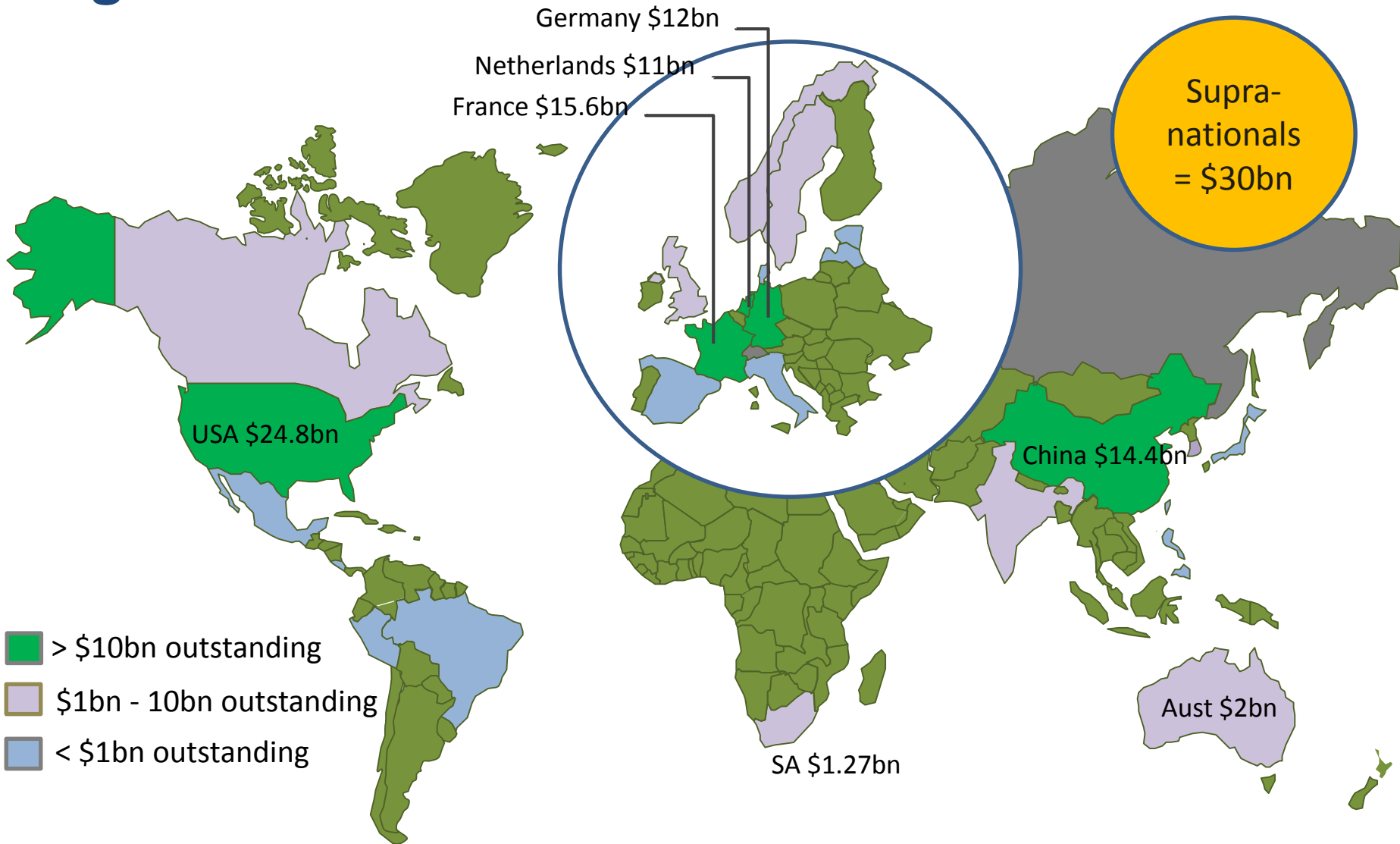
Justine Leigh-Bell, Director Market Development, Climate Bonds Initiative

Stockholm | August 2016

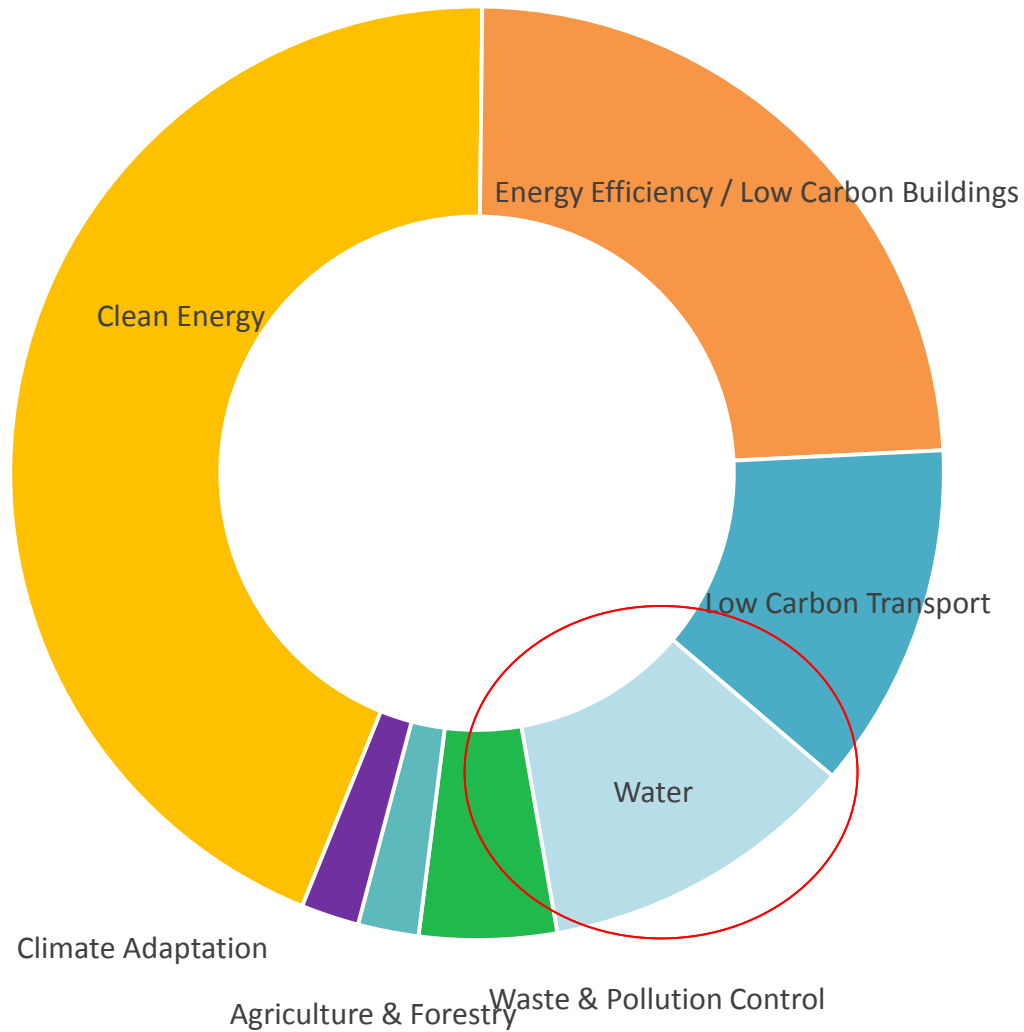
Green (Climate) Bonds are making headlines



A global market



Key sectors of issuance

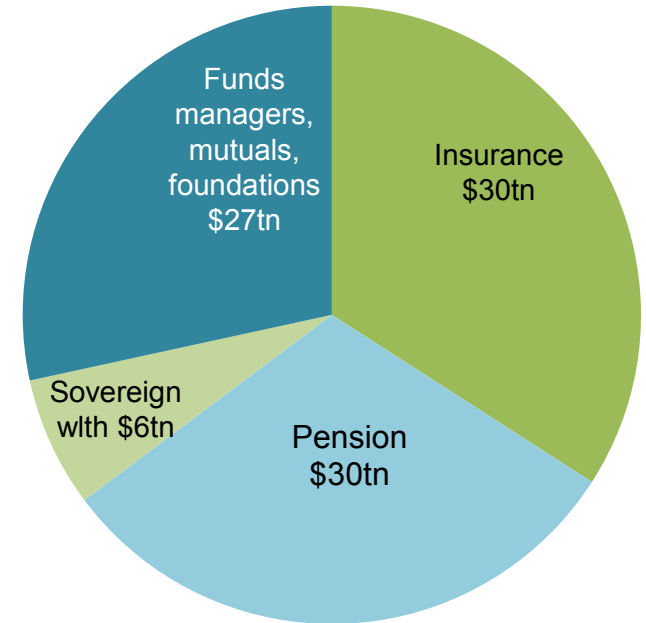


Investor driven

\$93^{tn} institutional investors AuM

- SRI = \$21^{tn} global
- \$43^{tn} at UN Climate Summit
- \$20^{tn} insurers x10 climate investments by 2020

Central banks: PBOC, BoE, various others



9 DECEMBER 2015

FROM INVESTORS REPRESENTING US\$11.2 TRILLION

The Paris Green Bonds Statement

We, the undersigned signatories to this statement, represent asset owners, investment managers and individual funds **managing a combined US\$11.2 trillion of assets**. We are substantial investors in the US\$100 trillion global bond market.

We understand: Climate change poses a significant risk to societies, the global economy and the environment.

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:

- Governments to act** through policy, regulation, risk mitigation, guarantees, tax credits and other mechanisms to support the issuance of bonds that both address climate change and allow us to meet our obligations to our beneficiaries.
- Experts in low carbon and climate resilient investments** to develop **clear and independent industry standards** for the climate change investments that they invest in.

SIGNATORIES

ACTIAM — Jacob de Wit, CEO
Addenda Capital — Brian Minns, Sustainable Investing Specialist
Affirmative Investment Management — Stuart Kinnersley, CEO & Co-Founder
AllianceBernstein — Peter S. Kraus, Chairman and CEO
Allianz Global Investors — Franck Dixmier, Global CIO Fixed Income
Amundi Asset Management — Bernard Carayon, Deputy CEO
APG Asset Management — Herman Slooijer, Managing Director Global Credits
APA/Fjärde AP-Fonden — Mikael Angberg, CIO
AP1/Första AP-Fonden — Ulrika Danielson, Head of Communications
AP2/Andra AP-fonden — Peter Lundkvist, AP3 Head of Corporate Governance
AP3/Tredje AP-fonden — Arne Löw, Head of Corporate Governance and Dr Ulf Erlandsson, Senior Portfolio Manager Credit
Aviva Investors — Dr Steve Waygood, Chief Sustainable Investment Officer
Aviva Investors Americas — Andrea Rossi, Head of Sustainable Investment Americas



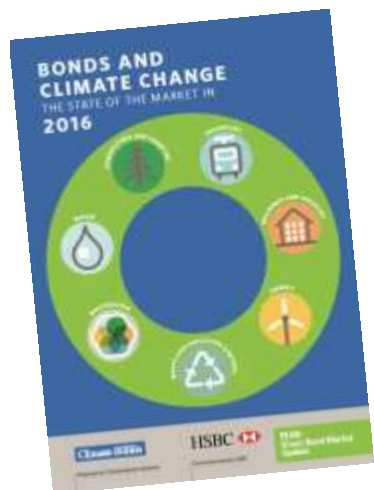
We have the capital



A \$694bn
climate-
aligned
bond
universe

\$118bn
labelled green bonds

\$576bn
*unlabelled climate-
aligned bonds*



Discovering the eligible investment landscape

ENERGY	LOW CARBON BUILDINGS	INDUSTRY & ENERGY-INTENSIVE COMMERCIAL	WASTE & POLLUTION CONTROL	TRANSPORT	INFORMATION TECHNOLOGY & COMMUNICATIONS	NATURE BASED ASSETS	WATER
Solar	Residential	Manufacturing	Recycling facilities	Rail	Power management	Agricultural land	Flood Defences
Wind	Commercial	Energy efficiency processes	Recycled products & circular economy	Vehicles	Broadband	Forests (managed and unmanaged)	Water distribution infrastructure
Geothermal	Retrofit	Energy efficiency products	Waste to energy	Mass transit	Resource efficiency	Wetlands	Water capture & storage infrastructure
Hydropower	Products for building carbon efficiency	Retail and wholesale	Methane management	Bus rapid transport	Teleconferencing	Degraded Lands	Water treatment plants
Bioenergy		Data centres	Geosequestration	Water-bourne transport		Other land uses (managed and unmanaged)	Assets in energy & production industries
Wave and Tidal		Process & fugitive emissions		Alternative fuel Infrastructure		Fisheries and aquaculture	
Energy distribution & management		Energy efficient appliances				Coastal infrastructure	
Dedicated transmission		Combined heat & power					



Guidelines and reviews

Green Bond Principles – ICMA



Proceeds must go to green / Explain process for project selection; use 2nd party review / Track proceeds; use auditor to verify / Report each year on details

International Climate Bonds Standard & Certification: green definitions

China: PBoC, NAFMII, NDRC

France: “Energy and Ecological Transition for Climate” Label

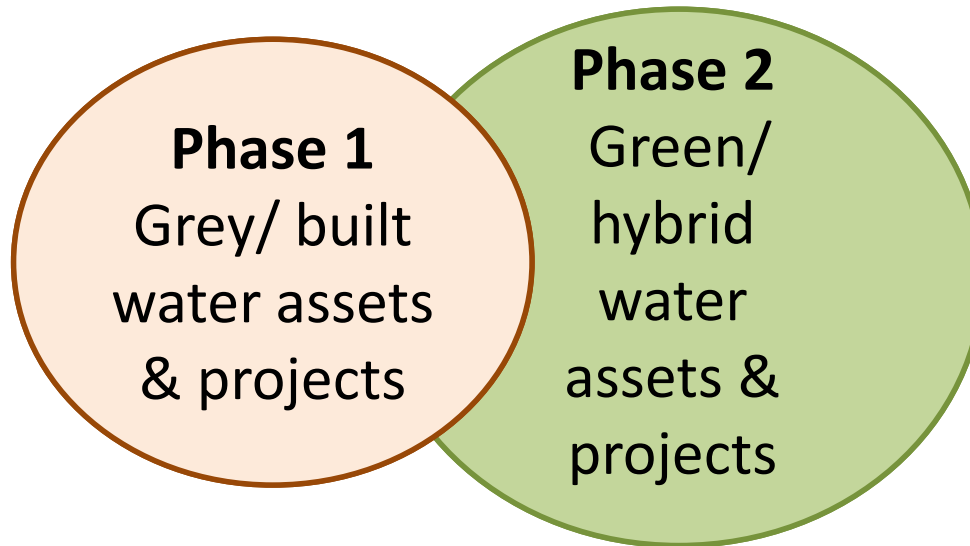


Moody’s green rating: quality of review & reporting

Climate Bonds Standard & Water Infrastructure

CBS Water Criteria capture eligible assets and projects relating to freshwater and waste water capture, treatment and distribution (including sewage systems, water treatment plants, flood defenses, distribution systems etc)

This includes nature-based-solutions



Why do Nature Based Solutions matter?

- NBS are a part of water infrastructure projects and solutions
- Opportunity: hybrid green-grey solutions
- Green bonds - elements of nature based solutions in their use of proceeds – eg San Francisco bond, various bonds out of China and elsewhere

What are Nature Based Solutions in the Water Space?

- Broadly defined as 'green' or hybrid green-grey solutions to water infrastructure
- Water NBS working group defined water infrastructure assets or projects that
 - Make use of existing ecosystems;
 - Restore existing ecosystems; and/ or
 - Use engineering to emulate ecosystem processes in some way, particularly when existing systems are degraded

Challenges

- What makes a climate compatible solution?
 - Maximises mitigation opportunities
 - Maximises resilience of the asset or project
 - Maximises adaptation and resilience in the broader watershed/ environmental, social and economic environment
- But how to assess these adaptation and resilience impacts?
 - Difficult to determine what metrics and measures
 - Focus is on design and management plans
 - ✓ Have key factors been assessed in asset design
 - ✓ Have adequate management plans been drawn up and implemented
- How to identify and balance trade offs between mitigation and adaptation?
- How to best manage natural resources, especially over large watersheds and resources, not all of which are under issuers ownership and or control. And when talking about very long timeframes – both re life of asset (multiple decades) and impact on ecosystem

Sub-sector	Assets
Water storage	<ul style="list-style-type: none"> Rainwater harvesting systems Aquatic ecosystems (lakes, wetlands) Aquifer storage Snowpack Runoff Groundwater recharge systems Riparian wetlands Stormwater management
Flood defences	<ul style="list-style-type: none"> Earthen defense systems & structures Ecological retention, current force reduction mechanisms Relocation of assets from floodplains / “room for the river” Early warning systems
Drought defences	<ul style="list-style-type: none"> Aquifer / groundwater storage (pumped) Recharge zone management Wetland storage Snowpack management Evaporation reduction efforts
Water treatment	<ul style="list-style-type: none"> Natural filtration / recycling systems (e.g. wetlands, watersheds, forests) Engineered natural filtration / settling systems Forest for water quality management

Sub-sector	Assets
Urban stormwater management	<p>Green roofs</p> <p>Permeable surfaces (parks, roads, etc.) and evapotranspiration systems</p> <p>Groundwater recharge</p> <p>Rainwater harvesting</p> <p>Constructed ecological retention ponds</p> <p>Forests for water quality management?</p> <p>Erosion control systems?</p>
Ecological restoration / management	<p>“Blue carbon” — peatland, estuaries, other ecological carbon storage systems</p> <p>Erosion control systems</p> <p>Hydrological restoration</p> <p>Freshwater fisheries</p>

What have we seen so far?

Green bonds w/NBS features	Proceeds	USD	year	Rating
State of Massachusetts	River revitalisation, habitat restoration, wetland remediation	100m	2016	AA+
San Francisco Public Utility	Sewer system/green infra	240m	2016	AAA
Nordic Investment Bank	Waste water/biodiversity	500m	2014	AAA

www.climatebonds.net

