

S&P Green Evaluation

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S&P Global
Ratings

THE GREEN EVALUATION

Applicable to green bonds but also to green bank loans, green ABS, equity and all other forms of sustainable finance

Green Evaluation - Introduction

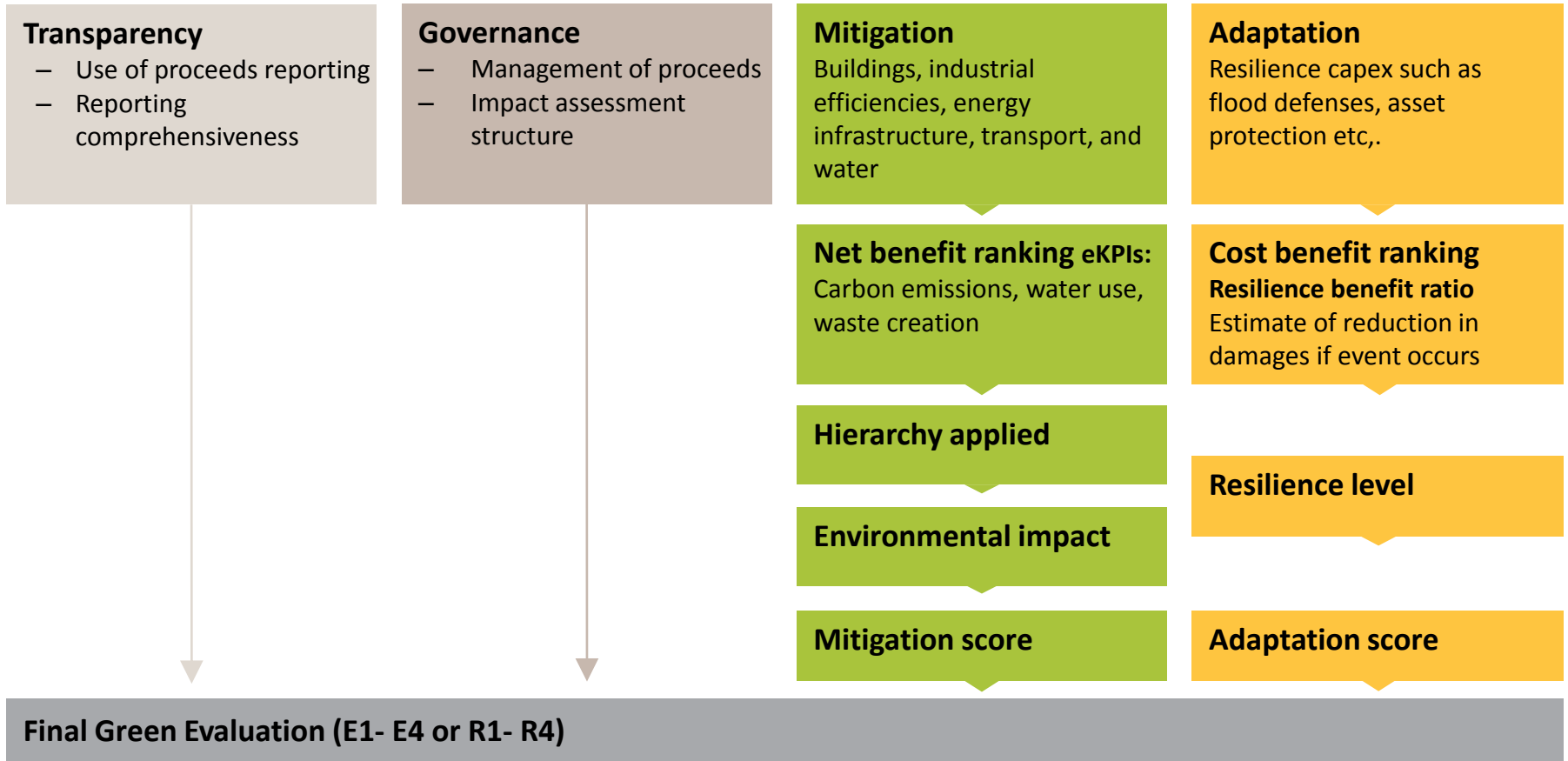
- *"For investors, green bond markets offer a stable, rated and liquid investment with long duration. For issuers, green bonds are a way to tap the huge \$100 trillion pool of patient private capital managed by global institutional fixed-income investors."*
 - **Mark Carney, Governor of the Bank of England, September 2016**

S&P Global's Role – The Green Evaluation

- ✓ Define the value of "green" for capital markets and any other financing
- ✓ Establish essential transparency in Green Finance
- ✓ Enable institutional investment in sustainability by providing the confidence of independent evaluation of environmental impact
- ✓ Go beyond existing tools and takes a local, sector-specific perspective on impact
- ✓ Provide a "green channel" to sustainable finance for institutional fixed income
- ✓ Covers all financings such as bank debt and equity not just green bonds

Green Evaluation Analytical Approach

Weighted aggregate of three:



* eKPI – Environmental Key Performance Indicator

Comprehensive Impact Evaluation

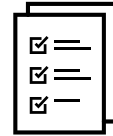
- Goes beyond existing assessment tools and takes a local, sector specific view



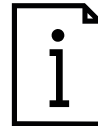
Establishes a hierarchy across technologies depending on their contribution to the green transition



Scores and weighs individual component scores in a transparent manner



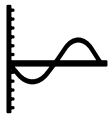
Includes analysis of governance, transparency and use of proceeds



Draws on, but is not limited to, green bond principles and existing green taxonomies



Focus on new build and improvements to enhance greenness or resilience



Based on local conditions baseline e.g. for energy generation projects we consider the emissions intensity of the local grid



Evaluation of projects' lifecycle impacts on the environment (construction, operation, decommissioning)

Net Benefit Calculation

Calculating the net benefit

$[E - I]$ = Total CO₂ emissions (tCO₂e) saved over the lifetime of the project

E Calculating the avoided emissions (Benefit)

Components of calculation:

(A) Expected electricity output of GE project over one year (kWh)

(B) Lifetime of the GE project (years)

(C) Carbon intensity of the local grid mix (tCO₂e per kWh)

Calculating the positive impact

$[A * B]$ = Total electricity output over GE project lifetime (kWh) (D)

$[C * D]$ = Total carbon emissions avoided from the grid over the GE project lifetime (tCO₂e) (E)

I Calculating the negative impact (Cost)

Components of calculation:

(B) Lifetime of the GE project (years)

(F) Carbon emissions per million USD generated per year (tCO₂e per USD million)

(G) Annual turnover of GE project associated with new power generation technology (USD million)

Calculating the negative impact

$[F * G]$ = Total carbon emissions each year for GE project (tCO₂e) (H)

$[H * B]$ = Total carbon emissions from the GE project over the GE project lifetime (tCO₂e) (I)

Other components of the calculation:

- Turnover (USD in one year) – estimated using Output and Feed-in Tariff. Turnover enables the emissions associated with developing and running an energy plant of this size to be estimated.
- Output (kWh per year) – estimated using 1MW capacity and region and technology specific capacity factors (%)
- Feed-in Tariff (USD per kWh) – A global average feed in tariff is used for each technology type (wind, solar etc.) so as not to distort estimations of plant size with country feed in tariff legislation.
- Capacity Factor (%)

An estimated amount of revenue associated with producing 1 MWh is needed as an intermediary factor so that Trucost's emission factors can be used (units in tCO₂e per million USD). A global average feed-in tariff for each technology type is used so that the performance of each technology can be compared fairly based on its environmental performance.

Carbon Hierarchy

The Mitigation or Adaptation categories account for 60% of the final score. In recognition of the varying levels of contribution to avoiding climate change by different technology, we consider each technology's overall contribution to decarbonization that would not be fully captured by our regional net benefit calculation alone. This gives us the overall score.

Role In Green Transition

Systematic decarbonization of economies

Significant Decarbonization of Key sectors through low-carbon solutions

Decarbonization by alleviating emissions in intensive industries

Decarbonization technologies with significant environmental hazards

Improvement of fossil fuel based activities' environmental efficiency & impact

Technology

Wind and Solar Power, Small and Large Hydro

Energy management and control

Green Transport apart from hybrid/fuel efficient vehicles

Green buildings new built best standards/net zero

Industrial efficiencies

Green Transport (with fossil fuel combustion) Green buildings refurbishment/new built lower standard

Energy-efficient products

Nuclear

Large Hydro in tropical areas

Coal to natural gas, Clean fuel production, Clean use of coal

↑
Increasing contribution to climate change avoidance

Source: S&P Global Ratings Proposal for a Green Bond Evaluation Tool. September 2, 2016.

Water Hierarchy

For water projects we consider each technology's overall contribution to sustainable water use that would not be fully captured by our net benefit calculation alone:

Role In Green Transition

System enhancements

Marginal system enhancements

Marginal system enhancements with material negative environmental consequences

Demand-side improvements

Technology

Recycling wastewater supply

Wastewater treatment

Reducing water losses in the water distribution network

Water desalination to supply potable municipal water

Conservation measures in buildings & equipment
Smart metering



Green Evaluation Inputs

Data requirements: the offering memorandum plus any additional information that might be required to answer the following questions:

- Are you or will you be able to outline the projects or **project types** that will be, or are likely to be, financed or refinanced by this transaction? **Technology, location** of the projects and the likely **proportion of proceeds assigned** to each project. E.g. 10% of proceeds assigned to a solar farm in Spain, 30% of proceeds assigned to a high-speed rail project in Colorado.
- Do you plan to document (commit to) the management and governance of the **funding allocation process**? E.g. Will you **report** on the allocation of proceeds to various projects? Will you document the **selection criteria** to pick a project for funding?
- Do you plan to **report on the environmental impact** of the projects financed?
- When are you likely to need the green evaluation? E.g. next week, this month, next month

Green Evaluation

City of Gothenburg

Transaction Overview

On June 15, 2016 the City of Gothenburg, Sweden issued Swedish krona (SEK) 1 billion of green bonds due June 15, 2022 to fund a number of eligible projects as part of its wider environmental initiatives. In accordance with the city's environmental programs, green bonds proceeds are targeted at financing projects in renewable energy, energy efficiency, public transportation, waste management, water treatment, and sustainable housing. The proceeds are solely dedicated to financing green projects, as defined within the city's environmental framework.

Green Evaluation Overview

Transaction Transparency

- Use of proceeds reporting
- Reporting comprehensiveness

56

Governance

- Management of proceeds
- Impact Assessment Structure

94

Mitigation

Sector	→ Net benefit ranking	→ Hierarchy overlay	
Green transport	Green transport without fossil fuel combustion		69
Green buildings	Green buildings – new build		

Adaptation

NA

Entity:	City of Gothenburg
ICB subsector:	N.A.
Location (HQ):	Sweden
Financing Value:	SEK 1 billion
Proportion of proceeds:	Full
Evaluation date:	June 19, 2017
Contact:	Andrea Croner +46 (0) 84-40-59-21 andrea.croner@spglobal.com



Green Evaluation Process

56

Transaction Transparency

94

Governance

69


Mitigation

Weighted aggregate of three
(Transaction Transparency + Governance + Mitigation)

E2/67

Overall score

Increasing Decarbonization Impact

Carbon intensity technology	Local baseline of carbon intensity	Net benefit ranking	Hierarchy overlay	Environmental impact score	Proceeds (SEK MIL.)
	High  Low Sweden				
Wind power			Green energy		
Solar power					
Small hydro					
Large hydro					
Energy management and control			Energy efficiency		
Unspecified					
Green transport without fossil fuel combustion		60	Green transport	81	170
Green buildings – new build		11	Green buildings	66	925
Unspecified					
Energy efficient projects (industrial efficiencies)			Energy efficiency		
Green transport with fossil fuel combustion			Green transport		
Green buildings refurbishment			Green buildings		
Unspecified					
Nuclear			Nuclear power		
Large hydro in tropical areas			Green energy		
Unspecified					
Coal to natural gas			Fossil fuel power plants		
Cleaner fuel production					
Cleaner use of coal					
Unspecified					
Water enhancements	Local baseline of water scarcity	Net benefit ranking	Hierarchy overlay	Environmental impact score	Proceeds (SEK MIL.)
Water			Water		

Green Evaluation

Three Gorges Finance II (Cayman Islands) Limited

Transaction Overview

On June 21, 2017 Three Gorges Finance II (Cayman Islands) Ltd. issued €650 million of unsecured unsubordinated 1.30% notes due 2024 guaranteed unconditionally and irrevocably by China Three Gorges Corp. The financing is a labelled green bond. Proceeds will be used to finance European renewable energy projects based in Portugal and Germany acquired by China Three Gorges Corp.

Entity:	Three Gorges Finance II (Cayman Islands) Limited
ICB subsector:	Renewable Energy Equipment
Location (HQ):	Beijing, China
Financing value:	€650 million
Amount evaluated:	100%
Evaluation date:	July 10, 2017
Contact:	Jessica Williams (44) 2017 176 3884 jessica.williams@spglobal.com

Green Evaluation Overview

Transparency

- Use of proceeds reporting
- Reporting comprehensiveness

67

Governance

- Management of proceeds
- Impact Assessment Structure

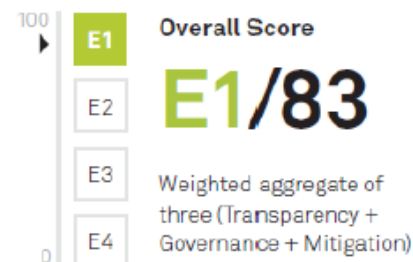
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Mitigation

Sector	→ Net Benefit Ranking	→ Hierarchy overlay	91
Renewable Energy	Onshore and Offshore Wind		

Adaptation

NA





Abhishek Danga

Director

Sector Lead, Infra, SSEA

Abhishek Danga is a Director in S&P Global Ratings team; based out of Singapore. He is the Sector Lead for all Infrastructure and Utilities companies in South & South-East Asia region and Lead Analyst for all corporates in South Asia (including India).

Abhishek joined S&P Global Ratings in 2010 with over seven years of work experience in credit related profiles. Before joining S&P, he was heading the Industry Research Group - Credit at Kotak Mahindra Bank. Abhishek has also worked with Lehman Brothers in the Global Risk Management function.

Abhishek is a management graduate from Indian Institute of Management (IIM), Indore. He is also a Chartered Accountant (CA) with Bachelor of Commerce (B.Com) degree and Certified FRM by the Global Association of Risk Professionals (GARP).

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