oekom research AKTIENGESELLSCHAFT

Second Party Opinion

Assessment of the Sustainability Quality of the
Green Bond
of Tokyo Metropolitan Government

23 August 2017

Aim and Scope of this Second Party Opinion

Tokyo Metropolitan Government (TMG) commissioned oekom research to assist with the issuance of its first Green Bond by confirming the sustainable added value of the bond. The assessment of the Green Bond was conducted using the criteria and indicators of a Green Bond Analysis Framework developed by oekom research. The aim of the Green Bond issuance is to fund projects that reduce environmental burdens, such as climate change (mitigation and adaptation) and projects that foster the efficient use of natural resources and biodiversity protection.

oekom research's mandate included the following services:

- Definition of a Green Bond Analysis Framework ("oekom Green Bond Analysis Framework") containing a clear description of eligible asset categories and the social and environmental criteria assigned to each category for evaluating the sustainability-related performance of the assets financed through the proceeds of the bond.
- Analysis of the alignment of the Green Bond to be issued against ICMA's Green Bond Principles.
- Evaluation of compliance of the Green Bond with the oekom Green Bond Analysis Framework criteria.
- Review and classification of Japan's sustainability performance on the basis of the oekom Country Rating.

Overall Evaluation of the Green Bond

All projects selected for inclusion in the Green Bond of Tokyo Metropolitan Government offer added social and/or environmental value. Regarding approximately 5% of the funded assets (Heat island countermeasures such as heat insulation and increasing water absorption capacities of roads) oekom research cannot identify a strong positive overall impact.

- Tokyo Metropolitan Government has defined a formal concept for its Green Bond regarding use of proceeds, processes for project evaluation and selection, management of proceeds and reporting. This concept is in line with the Green Bond Principles (Part I of this Second Party Opinion).
- The overall sustainability quality in terms of sustainability benefits and risk avoidance and minimisation of most of the funded assets is good. (Part II of this Second Party Opinion).
- The country, which the issuer forms part of, shows a good sustainability performance (Part III of this Second Party Opinion).

There are several aspects for which more specific selection or performance criteria would be strongly recommended as that could add to the overall quality of the Green Bond. Some of the most important aspects include strict human rights standards for the sourcing of timber (project category A.2 Sustainable timber use in green real estate), high standard regarding water quality for wastewater treatment (project category C.1 Wastewater treatment facility) and energy efficiency requirements as well as comprehensive health and safety measures for both passengers and operators during operation of public transport vehicles (project category D.1 Public transport vehicles). Additionally and even though this might be difficult to achieve in a built-up environment such as within the City of Tokyo, alterations to water bodies should be modelled as best as possible on the natural state of the respective water body (project category E.1 Flood prevention (no dams)).

Part I – Green Bond Principles

1) Use of Proceeds

The proceeds of this Green Bond will be used to finance selected eligible projects belonging to the Tokyo Environmental Master Plan issued in 2016. The projects are grouped into TMG's Environmental Categories:

TMG Environmental Category[1]		Share
Smart Energy & Urban Development		**49.00%**
1	Reduce greenhouse gas from office buildings	3.36%
2	Promote energy savings and energy management	17.07%
3	Promote advanced transportation technology use and bicycle use	7.00%
4	Enhance utilisation of renewable energy such as solar, geothermal, hydrogen, sewerage heat, etc.	21.57%
Sustainable Resource & Waste Management		**1.00%**
5	Reduce resource loss and increase eco-material use	1.00%
6	3R (reduce, reuse and recycle) – Promote cyclical use of waste	0.00%
7	Enhance utilisation of materials reducing environmental burden	0.00%
8	Enhance/ Promote the treatment of harmful waste	0.00%
Natural Environment Conservation		**6.00%**
9	Development of parks, planting trees along roads, afforestation, etc.	6.00%
10	Conserve biological diversity (Development of tideland in marine park, etc.)	0.00%

[1] Categories and percentages are reported as given by TMG.

TMG Environmental Category		Share
Improvements of Living Environment		**10.50%**
11	Improve water quality and groundwater conservation	5.00%
12	Improve air quality	0.00%
13	Promote countermeasures against soil contamination	0.00%
14	Heat island countermeasures (heat insulation and water absorption)	5.50%
Adaptation for Climate Change		**33.50%**
15	Countermeasures against rising temperatures in urban areas	0.00%
16	Countermeasures against flood and natural disasters	33.50%
Total		**100.00%**

Regarding the projects grouped into the TMG Environmental Category "14 Heat island countermeasures (heat insulation and water absorption)" oekom research acknowledges the added social and potential environmental value. However, oekom research cannot identify a strong positive overall impact and therefore the projects have not been included in this Second Party Opinion.

2) Process for Project Evaluation and Selection

The project selection for the inclusion in the Green Bond is carried out by TMG. The local government must either consult the Ministry of Internal Affairs and Communications and obtain its approval to issue municipal bonds or report to the Ministry before issuance.

The selection process is based on the Criteria for Evaluation and Selection of Target Projects defined by TMG. Those criteria include environmental, social and governance aspects, with a special focus on the measurement of environmental impacts.

Criteria for Evaluation & Selection of Projects	
E1	Clear positive environmental impact
E2	Reduction of negative environmental impact
S1	Clear positive social impact
S2	Reduction of negative social impact
G1	Policy & regulatory compliance
G2	Feasibility / urgency
G3	Sustainable effect

3) Management of Proceeds

According to Article 208 of the Local Government Finance Act, the annual expenditure of TMG in each fiscal year shall be assigned to its annual revenue. In accordance with this principle, TMG's Green Bond funds are allocated to projects within the fiscal year.

The Bureau of Finance monitors the allocation of the Green Bond funds and discloses the allocation status. All green bond related information will be disclosed on TMG's website[2].

After the end of the fiscal year, all TMG bonds, revenues and expenditures financed through them are audited by the Tokyo Metropolitan Audit and Inspection Commissioners. The Green Bond funds will be classified as such within TMG's accounting system.

4) Reporting

TMG will annually disclose a result of the allocation of the Green Bond proceeds on their website[2] including:

- The status of the allocation for the relevant issuance (in millions of yen)
- The environmental impacts
- The potential change of projects within project categories

[2] English: http://www.zaimu.metro.tokyo.jp/bond/en/en.html;
Japanese: http://www.zaimu.metro.tokyo.jp/bond/ir/ir.html

Part II – Sustainability Quality of the Green Bond

1) oekom Green Bond Analysis Framework

The oekom Green Bond Analysis Framework serves as a structure for evaluating the sustainability quality – i.e. the social and environmental added value – of the use of proceeds of TMG's Green Bond. It comprises firstly the definition of the use of proceeds category offering added social and/or environmental value and secondly the specific sustainability criteria by means of which this added value and therefore the sustainability performance of the Green Bond Asset Portfolio can be clearly identified and described.

The sustainability criteria are complemented by specific indicators, which enable quantitative measurement of the sustainability performance of the Green Bond Asset Portfolio and which can also be used for reporting. Details on the individual criteria and indicators for the categories can be found in Annex 1 „oekom Green Bond Analysis Framework".

2) Evaluation of the Assets Financed by the Green Bond

Method

With the help of the Japan Research Institute, limited (JRI), oekom research has evaluated whether the assets to be funded through TMG's Green Bond match the categories and criteria listed in the Green Bond Analysis Framework. The evaluation was carried out using information and documents provided by TMG to JRI, in Japanese, partially on a confidential basis. This information was translated and consolidated by JRI for oekom research. Original documents and proof were not required to be delivered to oekom research.
The information provided by TMG was complemented by national legislation and standards.

The following table provides a mapping of TMG'S environmental categories to oekom's project categories:

oekom Project Categories		TMG Environmental Categories[3]
A	**Green real estate development**	
A.1	Improved energy and resource efficiency in green real estate	1 & 2
A.2	Sustainable timber use in green real estate	5 & 7
A.3	Sustainable plantings in green real estate	9
B	**Renewable energy**	
B.1	Solar power	4
B.2	Geothermal heating and cooling systems	4
B.3	Hydro power (micro-hydro systems in water supply infrastructures)	4
C	**Pollution prevention and control**	
C.1.	Wastewater treatment facility	11
D	**Public transport**	
D.1.	Public transport vehicles	3
E.	**Adaptation to climate change**	
E.1.	Flood prevention (no dams)	16

[3] See pp. 3 and 4 for details.

Findings

A. Green real estate development

A.1. Improved energy and resource efficiency in green real estate

Sustainability risks and benefits of the project category

The main environmental benefit of energy and resource efficiency comprises climate protection through the long-term reduction of energy and resource consumption and therefore a transition towards a low carbon economy. Further, improvements to energy and resource efficiency help to conserve natural resources and reduce environmental impact.

At the same time, there are possible sustainability risks that need to be taken into account. Possible social risks stem from working conditions at construction sites and the supply chain of installed electronic equipment. Relevant environmental issues arise from the use of certain hazardous substances in electrical and electronic equipment and recycling at the end-of-life stage.

All assets selected for the Green Bond are located in a highly regulated and developed country.

- 1. Percentage improvement of energy and resource efficiency
  - ✓ According to TMG, some of the financed projects are expected to achieve a percentage improvement of more than 50% once completed.
- 2. Working conditions during construction and maintenance work
  - ✓ 100% of financed projects are located in Japan where high standards regarding labour rights (e.g. ILO core conventions) and health and safety are in place for construction and maintenance work conducted by own employees and contractors.
  - O However, in practice enforcement in Japan is only partially effective and a number of cases of forced labour are reported throughout the country. Those cases are not directly linked to the projects financed through this Green Bond.
- 3. Social standards in the supply chain
  - O No information is available on where the electronic equipment will be sourced from. Therefore it cannot be determined whether high labour standards will be applied in the supply chain (e.g. ILO core conventions).
- 4. Environmental aspects of installed electronic equipment
  - ✓ 100% of financed projects meet high environmental standards regarding take-back and recycling of electronic equipment at end-of-life stage.

- ✓ For 100% of financed projects the use of certain hazardous substances (e.g. lead, mercury, cadmium) is restricted in electrical equipment by the Japanese law for promotion of effective utilisation of resources (J-MOSS).

Controversy assessment

- A controversy assessment on the underlying assets did not reveal any controversial activities or practices that could be attributed to TMG.

A.2. Sustainable timber use in green real estate

Sustainability risks and benefits of the project category

The use of sustainable timber in real estate is beneficial from an environmental point of view as it allows the use of natural resources and supports the preservation and protection of valuable ecosystems at the same time. Additionally, timber as a building material has a lower overall carbon footprint compared to alternatives such as steel, concrete or brick, as less energy is used in its production and transport. From a social point of view, the use of sustainable timber can contribute to the livelihoods of communities that depend on sustainable forest management as forests provide them with food, energy, shelter and income.

Still, when evaluating the use of timber in building projects, certain social and environmental risks need to be taken into account. Most of these issues stem from how the timber is sourced. Supply of timber poses a major environmental threat to habitat and wildlife through logging in ecologically significant forests, fertilizer use or water stress. Social risks are mainly posed by disrespect of labour and human rights and disregard of rights of local communities regarding forest access, economical income and cultural identity. As with any building project, working conditions at construction sites can also be a concern.

All assets selected for the Green Bond are located in a highly regulated and developed country.

- 1. Working conditions on construction sites
  - ✓ 100% of financed projects are located in Japan where high standards regarding labour rights (e.g. ILO core conventions) and health and safety are in place for construction and maintenance work conducted by own employees and contractors.
  - O However, in practice enforcement in Japan is only partially effective and a number of cases of forced labour are reported throughout the country. Those cases are not directly linked to the projects financed through this Green Bond.
- 2. Environmental standards in the supply chain
  - ✓ For 2 of the 3 financed projects timber originates from sources that are not located in regions with high levels of water stress or that conducted water impact assessments.
  - ✓ For 100% of financed projects timber originates from sources that ensure conservation of natural habitat and wildlife (e.g. no logging of primary forest, ecologically significant secondary forest or protected areas such as Ramsar sites, UNESCO Natural Word Heritage, IUCN protected areas I-IV, Intact Forest Landscape).
  - ✓ For 2 of the 3 financed projects timber originates from sources that provide for measures to protect biodiversity (e.g. biodiversity assessment, creation of corridors between biodiversity hotspots, training of workers and managers).

- ✓ For 2 of the 3 financed projects timber originates from sources that exclude genetically modified organisms.
- O No information is available on whether financed timber originates from sources that provide for high standards regarding use of chemicals and fertilizers (e.g. exclusion of certain fertilizers, reduction targets).

- 3. Social standards in the supply chain
  - ✓ According to TMG, timber is to be sourced from Japan and thus, high standards regarding labour rights (e.g. ILO core conventions) and health and safety are applied in the supply chain.
  - O However, in practice enforcement in Japan is only partially effective and a number of cases of forced labour are reported throughout the country. Those cases are not directly linked to the projects financed through this Green Bond.
  - ✓ According to TMG, affected communities are to be informed, grievance mechanisms and compensation schemes need to be in place and violations of human rights shall be avoided.
  - O However, no information is available on whether further standards regarding human rights and consideration of impacts on local communities (e.g. respect for internationally recognised human rights, commitment to seek free, prior and informed consent) are in place.

Controversy assessment

- A controversy assessment on the underlying assets did not reveal any controversial activities or practices that could be attributed to TMG.

A.3. Sustainable plantings in green real estate

Sustainability risks and benefits of the project category

The planting of green areas in the build environment is beneficial from a sustainability point of view as living plants absorb CO_2 as part of photosynthesis and thereby contribute to climate protection as well as to improving air quality. Further, from a social point of view, green areas can improve health and well-being of local residents.

At the same time, possible sustainability risks stem from intensive resource use for cultivation in case plants are not suited to the region, climate and soil. Within the supply chain, mismanagement of soil, biodiversity and water constitute environmental risks. Social risks are mainly posed by disrespect of labour and human rights.

All assets selected for the Green Bond are located in a highly regulated and developed country.

- 1. Environmental aspects of plantings
  - ✓ According to TMG, 100% of financed projects use native species or select plants in line with characteristics of the region.
  - O However, no information is available on whether a reduced need of irrigation and high capacity of CO_2 absorption and storage are taken into consideration.
- 2. Working conditions at building sites
  - ✓ 100% of financed projects are located in Japan where high standards regarding labour rights (e.g. ILO core conventions) and health and safety are in place for construction and maintenance work conducted by own employees and contractors.
  - O However, in practice enforcement in Japan is only partially effective and a number of cases of forced labour are reported throughout the country. Those cases are not directly linked to the projects financed through this Green Bond.
- 3. Environmental aspects in the supply chain
  - O No information is available on whether plants originate from sources that provide for sustainable soil and biodiversity management along the whole value chain (e.g. strong position on pesticide and chemical fertiliser use, deforestation, soil degradation, biodiversity).
  - O For 100% of financed projects, plants originate from sources that regulate the use of genetically modified organisms, however the use is not prohibited.
  - O No information is available on whether plants originate from sources that are not located in regions with high levels of water stress or sources that were subject to a water impact assessment.

- 4. Social standards in the supply chain
  - ✓ According to TMG, plants are to be sourced from Japan and thus, high standards regarding labour rights (e.g. ILO core conventions) and health and safety are applied in the supply chain.
  - O However, in practice enforcement in Japan is only partially effective and a number of cases of forced labour are reported throughout the country. Those cases are not directly linked to the projects financed through this Green Bond.
  - ✓ According to TMG, affected communities are to be informed, grievance mechanisms and compensation schemes need to be in place and violations of human rights shall be avoided.
  - O However, no information is available on whether further standards regarding human rights (e.g. respect for internationally recognised human rights, right to water, resettlement and compensation) are in place.

Controversy assessment

- A controversy assessment on the underlying assets did not reveal any controversial activities or practices that could be attributed to TMG.

B. Renewable energy

B.1. Solar power

Sustainability risks and benefits of the project category

The environmental benefits of solar power comprise climate protection and the transition towards a low carbon economy. Further benefits are less environmental intervention (e.g. resource extraction, releases of waste streams to water or soil) and less need for cooling water in comparison to fossil fuel or nuclear power plants. From a social perspective, the transition from fossil fuels to solar power lowers negative human rights impacts of oil, gas and coal production (e.g. land-use conflicts, resettlement). In addition – different from fossil fuels combustion – solar power does not impact air quality.

With respect to potential risks, the manufacturing of solar panels in developing countries such as China can have negative social and environmental impacts. As the production of solar panels requires scarce raw materials and as the panels contain hazardous substances, aspects such as recyclability, management of hazardous substances and conversion efficiency are relevant to evaluate the overall environmental performance of related projects. However, in comparison with other renewable energy sources, social and environmental risks related to solar power are deemed to be low.

All assets selected for the Green Bond are located in a highly regulated and developed country.

- 1. Consideration of environmental aspects during planning and construction
  - Not applicable as all solar systems are PV roof systems.
- 2. Environmental aspects of PV plants
  - ✓ According to TMG, approximately 80% of financed projects reach a conversion efficiency of at least 15%.
  - ✓ According to TMG, 100% of financed projects meet high environmental standards regarding take-back and recycling of PV modules at end-of-life stage
  - O No information is available on whether the use of certain hazardous substances (e.g. lead, mercury, cadmium) is restricted for the financed projects.
- 3. Community dialogue
  - Not applicable as all solar systems are PV roof systems.
- 4. Working conditions during construction and maintenance work
  - ✓ 100% of financed projects are located in Japan where high standards regarding labour rights (e.g. ILO core conventions) and health and safety are in place for construction and maintenance work conducted by own employees and contractors.

  - However, in practice enforcement in Japan is only partially effective and a number of cases of forced labour are reported throughout the country. Those cases are not directly linked to the projects financed through this Green Bond.
- 5. Social standards in the supply chain
  - No information is available on whether high labour standards are applied in the supply chain (e.g. ILO core conventions).

Controversy assessment

- A controversy assessment on the underlying assets did not reveal any controversial activities or practices that could be attributed to TMG.

B.2. Geothermal heating and cooling systems

Sustainability risks and benefits of the project category

The environmental benefits of geothermal power comprise climate protection and the transition towards a low carbon economy. Further benefits are less environmental intervention (e.g. resource extraction, releases of waste streams to water or soil) and less need for cooling water in comparison to fossil fuel or nuclear power plants. From a social perspective, the transition from fossil fuels to geothermal power lowers negative human rights impacts of oil, gas and coal production (e.g. land-use conflicts, resettlement). In addition – different from fossil fuels combustion – geothermal power does not impact air quality.

However, the installation of geothermal heating and cooling systems can result in negative environmental impacts at construction sites (e.g. ground and groundwater risks). Further risks include potentially poor environmental standards of geothermal installations (i.e. contamination of ground water) and potentially poor working conditions during construction and installation.

All assets selected for the Green Bond are located in a highly regulated and developed country.

- 1. Consideration of environmental aspects during planning and construction
  - ✓ According to TMG, all financed projects underwent environmental impact assessments at the planning stage.
  - ✓ According to TMG, all financed projects underwent assessments regarding site-specific conditions in relation to geology and hydrology.
  - ✓ According to TMG, all financed projects meet high environmental standards and requirements during the construction phase (e.g. noise mitigation, minimisation of environmental impact during construction work).
- 2. Environmental aspects of geothermal heating and cooling systems
  - ✓ According to TMG, all financed projects have measures in place to avoid contamination of soil and groundwater (e.g. regarding borehole completion, leakage prevention, decommissioning at end-of-life).
- 3. Working conditions during construction
  - ✓ 100% of financed projects are located in Japan where high standards regarding labour rights (e.g. ILO core conventions) and health and safety are in place for construction work conducted by own employees and contractors.
  - O However, in practice enforcement in Japan is only partially effective and a number of cases of forced labour are reported throughout the country. Those cases are not directly linked to the projects financed through this Green Bond.

- 4. Social standards in the supply chain
  - No information is available on whether high labour standards are applied in the supply chain (e.g. ILO core conventions).

Controversy assessment

- A controversy assessment on the underlying assets did not reveal any controversial activities or practices that could be attributed to TMG.

B.3. Hydro power (micro-hydro systems in water supply infrastructures)

Sustainability risks and benefits of the project category

From an environmental perspective, hydro power projects contribute to climate protection and to a transition towards a low-carbon economy. Further benefits are less environmental degradation and pollution (e.g. through resource extraction, releases of waste streams to water or soil) in comparison to fossil fuels or nuclear power plants. From a social perspective, the transition from fossil fuels to hydro power decreases negative human rights impacts of oil, gas and coal production (e.g. land-use conflicts, resettlement). In addition – in comparison to fossil fuel combustion – hydro power does not negatively impact air quality.

However, the construction and operation of micro-hydro systems in water supply infrastructures can result in negative environmental impacts. Faulty pipes might lead to leakages and thus water loss in the water distribution system. The main social risks stem from potentially poor working conditions during construction and in the operational stage.

All assets selected for the Green Bond are located in a highly regulated and developed country.

- 1. Consideration of environmental aspects during planning and construction
  - ✓ According to TMG, all financed projects meet high environmental standards and requirements during the construction phase (e.g. noise mitigation, minimisation of environmental impact during construction work).
- 2. Working conditions during construction and maintenance work
  - ✓ 100% of financed projects are located in Japan where high standards regarding labour rights (e.g. ILO core conventions) and health and safety are in place for construction and maintenance work conducted by own employees and contractors.
  - O However, in practice enforcement in Japan is only partially effective and a number of cases of forced labour are reported throughout the country. Those cases are not directly linked to the projects financed through this Green Bond.
- 3. Environmental aspects of micro-hydro systems in water supply infrastructures
  - ✓ 100% of financed projects feature measures to reduce nuisances from the water distribution system (e.g. earthquake resistance measures, trouble monitoring).

Controversy assessment

- A controversy assessment on the underlying assets did not reveal any controversial activities or practices that could be attributed to TMG.

C. Pollution prevention and control

C.1. Wastewater treatment facility

Sustainability risks and benefits of the project category

From a sustainability point of view, wastewater treatment is beneficial as it helps to maintain clean water for reuse, to optimise resource recovery and provide a solution to water shortages. Furthermore, wastewater treatment can safeguard water sources and the ground from contamination through wastewater, which is harmful to people as well as flora and fauna. Properly treated wastewater contains fewer nutrients, which would otherwise stimulate growth of algae and reduce the availability of oxygen, therefore contributing to the protection of aquatic life.

At the same time, the construction and operation of wastewater treatment facilities can present social as well as environmental risks. Social risks mainly stem from workers' health and safety and from nuisance of local residents. Environmental risks stem from possible environmental impacts of wastewater treatment processes, i.e. leakage of sewage or poor management of sewage sludge disposal (e.g. disposal into waterways). Also, quality standards for treated water need to be taken into account when evaluating wastewater treatment projects.

All assets selected for the Green Bond are located in a highly-regulated and developed country.

- 1. Consideration of environmental aspects during planning and construction
  - As all facilities are add-ons to existing facilities, environmental impact assessments are not required.
  - ✓ According to TMG, none of the financed projects are located in key biodiversity areas (e.g. exclusion of Ramsar sites, UNESCO Natural Word Heritage, IUCN protected areas I-IV).
  - ✓ According to TMG, all financed projects meet high environmental standards and requirements during the construction phase (e.g. noise mitigation, minimisation of environmental impact during construction work).
- 2. Environmental impacts of wastewater treatment facility
  - ✓ According to TMG, 100% of financed projects feature measures to prevent leakage of sewerage systems (e.g. earthquake resistance measures, trouble monitoring).
  - ✓ According to TMG, 100% of financed projects feature measures to reduce the environmental impacts of sewage sludge disposal (e.g. exclusion of introduction into waterways and landfill, exclusion for agricultural use).
  - ✓ TMG has plans to use sludge for energy generation.

  - No details are available on high standards regarding the quality of treated water. However, according to TMG, 100% of financed projects will lead to quality improvements of treated water.
- 3. Community dialogue
  - ✓ According to TMG, financed projects feature community dialogue as an integral part of the planning process and construction phase (e.g. information of communities, grievance mechanisms and compensation schemes).
  - However, no information is available on further measures (e.g. community advisory panels and committees and surveys and dialogue platforms).
- 4. Working conditions during construction and operation
  - ✓ 100% of financed projects are located in Japan where high standards regarding labour rights (e.g. ILO core conventions) and health and safety are in place for construction and operational work conducted by own employees and contractors.
  - However, in practice enforcement in Japan is only partially effective and a number of cases of forced labour are reported throughout the country. Those cases are not directly linked to the projects financed through this Green Bond.

Controversy assessment

- A controversy assessment on the underlying assets did not reveal any controversial activities or practices that could be attributed to TMG.

D. Public transport

D.1. Public transport vehicles

Sustainability risks and benefits of the project category

The acquisition of low pollution buses is positive from an environmental point of view as further public transport helps foster climate protection through lower carbon emissions.

At the same time, when evaluating the production of buses, certain risks have to be taken into account. Major risks from an environmental point of view stem from the negligence of environmental impacts throughout the whole life-cycle (i.e. all impacts from cradle to grave). Social risks stem from safety of both workers at production sites and potential bus operators and passengers.

All assets selected for the Green Bond are located in a highly regulated and developed country.

- 1. Consideration of environmental aspects at manufacturing sites (only applicable for newly produced vehicles)
  - ✓ 100% of financed vehicles are produced at manufacturing sites that have comprehensive environmental management systems in place.
  - ✓ 100% of financed vehicles are produced at manufacturing sites that properly manage direct and indirect carbon emissions (through e.g. inventories, targets and action plans).
  - O No information is available on whether financed vehicles are produced at manufacturing sites where substances of concern are strictly limited in production processes.
- 2. Working conditions at manufacturing sites (only applicable for newly produced vehicles)
  - O No information is available on whether financed vehicles are produced at manufacturing sites that have a comprehensive health and safety management system in place.
  - O No information is available on whether financed vehicles are produced at manufacturing sites where high labour standards are guaranteed (e.g. ILO core conventions).
- 3. Environmental aspects of vehicles
  - ✓ 100% of financed vehicles are sourced from a supplier who conducts life-cycle-assessments.
  - O No information is available on whether material efficiency and the use of recycled materials are considered during product design for the financed vehicles.
  - O No information is available on whether recyclability at end-of-life stage has been considered during design and construction for the financed vehicles.
  - O No information is available on whether energy efficiency during operation is optimised (e.g. through energy recovery systems) for the financed vehicles.

- 4. Social aspects of vehicles
  - ✓ 100% of financed vehicles meet requirements to minimise noise exposure (as provided for by national legislation).
  - O According to TMG, for 100% of financed vehicles some measures to ensure health and safety for both passengers and operators are in place. However, no information is available on vigilance controls.
- 5. Social standards in the supply chain (only applicable for newly produced vehicles)
  - O No information is available on whether manufacturers require high labour standards in their supply chain (e.g. ILO core conventions).

Controversy assessment

- A controversy assessment on the underlying assets did not reveal any controversial activities or practices that could be attributed to TMG.

E. Adaptation to climate change

E.1. Flood prevention (no dams)

Sustainability risks and benefits of the project category

Flood prevention is positive from a sustainability point of view as floods can have severe impacts on humans as well as ecosystems. Floods can endanger humans and other species; they can cause soil erosion through rapid water runoff and contaminate habitats. By remodelling water bodies to their natural states, consequences of floods are prevented without restricting the water body, natural habitats are restored and biodiversity strengthened.

At the same time, flood prevention measures can represent social as well as environmental risks. Social risks mainly stem from workers' health and safety and from nuisance of local residents. Environmental risks stem from possible environmental impacts during construction but also from inadequate species protection during and after construction.

All assets selected for the Green Bond are located in a highly regulated and developed country.

- 1. Consideration of environmental aspects during planning and construction
  - ✓ According to TMG, 100% of financed projects underwent assessments at the planning stage similar to environmental impact assessments.
  - ✓ According to TMG, all financed projects meet high environmental standards and requirements regarding noise mitigation during the construction phase.
  - O However, no information is available on measures to effectively minimise the environmental impact during the construction phase.
- 2. Working conditions during construction and operation
  - ✓ 100% of financed projects are located in Japan where high standards regarding labour rights (e.g. ILO core conventions) and health and safety are in place for construction and operational work conducted by own employees and contractors.
  - O However, in practice enforcement in Japan is only partially effective and a number of cases of forced labour are reported throughout the country. Those cases are not directly linked to the projects financed through this Green Bond.
- 3. Modelling on natural state of water bodies, scientific monitoring, structural quality mapping
  - ✓ According to TMG, for 2 of the 3 financed projects the relevant plans are scientifically monitored.
  - O Due to the densely built-up environment within Tokyo, water bodies are generally not modelled on the natural state of the water body.

- 4. Community dialogue
  - ✓ According to TMG, financed projects feature community dialogue as an integral part of the planning process and construction phase (e.g. information of communities, grievance mechanisms and compensation schemes).
  - O However, no information is available on further measures (e.g. community advisory panels and committees and surveys and dialogue platforms).
- 5. Social standards in the supply chain
  - O No information is available on whether high labour standards are applied in the supply chain (e.g. ILO core conventions).

Controversy assessment

- A controversy assessment on the underlying assets did not reveal any controversial activities or practices that could be attributed to TMG.

Part III – Assessment of Japan's Sustainability Performance

In order to evaluate the sustainability performance of public authority bond issuers, oekom research applies the rating of the country which these form part of. In the oekom Country Rating with a rating scale from A+ (excellent) to D- (poor), Japan was awarded a score of B- and classified as "Prime".

As at 23 August 2017, this rating puts Japan in place 27 out of 57 countries rated by oekom research.

The oekom Country Rating evaluates the following six areas in order to determine the sustainability performance of a country:

Social Rating

- Political System and Governance
- Human Rights and Fundamental Freedoms
- Social Conditions

Environmental Rating

- Natural Resources
- Climate Change and Energy
- Production and Consumption

Japan achieved a rating that was above the average of all countries in the social part of the rating. In the environmental part, the country shows an average or slightly below average performance of all rated countries.

Japan violates the exclusion criteria death penalty, climate protection and whaling screened by oekom research.

Details on the rating of the country can be found in Annex 2 "oekom Country Rating of Japan".

oekom research AG

Munich, 23 August 2017

Disclaimer

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About oekom research

oekom research is one of the world's leading rating agencies in the field of sustainable investment. The agency analyses companies and countries with regard to their environmental and social performance. oekom research has extensive experience as a partner to institutional investors and financial service providers, identifying issuers of securities and bonds which are distinguished by their responsible management of social and environmental issues. More than 100 asset managers and asset owners routinely draw on the rating agency's research in their investment decision making. oekom research's analyses therefore currently influence the management of assets valued at over 600 billion euros.

As part of our Green Bond Services, we provide support for companies and institutions issuing sustainable bonds, advise them on the selection of categories of projects to be financed and help them to define ambitious criteria. We verify the compliance with the criteria in the selection of projects and draw up an independent second party opinion so that investors are as well informed as possible about the quality of the loan from a sustainability point of view.

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Annexes

- Annex 1: oekom Green Bond Analysis Framework
- Annex 2: oekom Country Rating of Japan

Annex 1: oekom Green Bond Analysis Framework

oekom Green Bond Analysis Framework

The oekom Green Bond Analysis Framework serves as a structure for evaluating the sustainability quality – i.e. the social and environmental added value – of the Green Bond Asset Portfolio. It comprises firstly the definition of the use of proceeds category offering added social and/or environmental value and secondly the specific sustainability criteria by means of which this added value and therefore the sustainability performance of the Green Bond Asset Portfolio can be clearly identified and described.

The sustainability criteria are complemented by specific indicators, which enable quantitative measurement of the sustainability performance of the Green Bond Asset Portfolio and which can be used for comprehensive reporting.

Use of Proceeds

A. Green real estate development

- Improved energy and resource efficiency in green real estate
- Sustainable timber use in green real estate
- Sustainable plantings in green real estate

B. Renewable energy

- Solar power
- Geothermal heating and cooling systems
- Hydro power (micro-hydro systems in water supply infrastructures)

C. Pollution prevention and control

- Wastewater treatment facility

D. Public transport

- Public transport vehicles

E. Adaptation to climate change

- Flood prevention (no dams)

Sustainability Criteria and Indicators for Use of Proceeds

In order to ensure that the environmental and social risks linked to the underlying assets are prevented and the opportunities clearly fostered, a set of sustainability criteria has been established for the asset categories.

A. Green real estate development

Improved energy and resource efficiency in green real estate

1. Percentage improvement of energy and resource efficiency

Quantitative indicator:

- Percentage of financed projects for which the percentage improvement reaches or exceeds 20% for energy efficiency and / or 10% for resource efficiency.

2. Working conditions during construction and maintenance work

Quantitative indicator:

- Percentage of financed projects with high labour and health and safety standards for construction and maintenance work conducted by own employees and contractors (e.g. ILO core conventions).

3. Social standards in the supply chain

Quantitative indicator:

- Percentage of financed projects for which high labour standards are applied in the supply chain (e.g. ILO core conventions).

4. Environmental aspects of installed electronic equipment

Quantitative indicators:

- Percentage of financed projects which meet high environmental standards regarding take-back and recycling of electronic equipment at end-of-life stage.
- Percentage of financed projects for which the thresholds defined by the European Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS Directive) are fulfilled.

Controversies

- Description of controversies (e.g. due to labour rights violations, accidents).

Sustainable timber use in green real estate

1. Working conditions on construction sites

Quantitative indicator:

- Percentage of financed projects which provide for high labour and health and safety standards for construction work conducted by own employees and contractors (e.g. ILO core conventions).

2. Environmental standards in the supply chain

Quantitative indicators:

- Percentage of financed timber which originates from sources that are not located in regions with high levels of water stress or that conducted water impact assessments.
- Percentage of financed timber which originates from sources that ensure conservation of natural habitat and wildlife (e.g. no logging of primary forest, ecologically significant secondary forest or protected areas such as Ramsar sites, UNESCO Natural Word Heritage, IUCN protected areas I-IV, Intact Forest Landscape).
- Percentage of financed timber which originates from sources that provide for measures to protect biodiversity (e.g. biodiversity assessment, creation of corridors between biodiversity hotspots, training of workers and managers).
- Percentage of financed timber which originates from sources that exclude genetically modified organisms.
- Percentage of financed timber which originates from sources that provide for high standards regarding use of chemicals and fertilizers (e.g. exclusion of certain fertilizers, reduction targets).

3. Social standards in the supply chain

Quantitative indicators:

- Percentage of financed projects for which high labour standards are applied in the supply chain (e.g. ILO core conventions).
- Percentage of financed projects which provide for high standards regarding human rights and consideration of impacts on local communities (e.g. respect for internationally recognised human rights, commitment to seek free, prior and informed consent).

Controversies

- Description of controversies (e.g. due to accidents, biodiversity issues, human rights).

Sustainable plantings in green real estate

1. Environmental aspects of plantings

Quantitative indicator:

- Percentage of financed projects which use sustainable plants (e.g. reduced need of irrigation, appropriate to the region, climate and soil, with high capacity of CO_2 absorption and storage).

2. Working conditions at building sites

Quantitative indicator:

- Percentage of financed projects which provide for high labour and health and safety standards for own employees and contractors (e.g. ILO core conventions).

3. Environmental aspects in the supply chain

Quantitative indicators:

- Percentage of financed plants which originate from sources that provide for sustainable soil and biodiversity management along the whole value chain (e.g. position on pesticide and chemical fertiliser use, deforestation, soil degradation, biodiversity).
- Percentage of financed plants which originate from sources that do not use genetically modified organisms.
- Percentage of financed plants which originate from sources that are not located in regions with high levels of water stress or sources that were subject to a water impact assessment.

4. Social standards in the supply chain

Quantitative indicators:

- Percentage of financed projects for which high labour standards are applied in the supply chain (e.g. ILO core conventions).
- Percentage of financed projects which provide for high standards regarding human rights (e.g. respect for internationally recognised human rights, right to water, resettlement and compensation).

Controversies

- Description of controversies (e.g. due to labour rights violations, accidents, adverse biodiversity impacts).

B. Renewable energy

Solar power

1. Consideration of environmental aspects during planning and construction (not applicable for PV roof systems)

Quantitative indicators:

- Percentage of financed projects which underwent environmental impact assessments at the planning stage.
- Percentage of financed projects which meet high environmental standards and requirements during the construction phase (e.g. noise mitigation, minimisation of environmental impacts during construction work).

2. Environmental aspects of PV plants

Quantitative indicators:

- Percentage of financed projects for which conversion efficiency is at least 15%.
- Percentage of financed projects which meet high environmental standards regarding take-back and recycling of PV modules at end-of-life stage.
- Percentage of financed projects for which the thresholds defined by the European Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS Directive) are voluntarily fulfilled.

3. Community dialogue (not applicable for PV roof systems)

Quantitative indicator:

- Percentage of financed projects which feature community dialogue as an integral part of the planning process and construction phase (e.g. sound information of communities, community advisory panels and committees, surveys and dialogue platforms, grievance mechanisms and compensation schemes).

4. Working conditions during construction and maintenance work

Quantitative indicator:

- Percentage of financed projects with high labour and health and safety standards for construction and maintenance work conducted by own employees and contractors (e.g. ILO core conventions).

5. Social standards in the supply chain

Quantitative indicator:

- Percentage of financed projects for which high labour standards are applied in the supply chain (e.g. ILO core conventions).

Controversies

- Description of controversial projects (e.g. due to accidents, adverse biodiversity impacts).

Geothermal heating and cooling systems

1. Consideration of environmental aspects during planning and construction

Quantitative indicators:

- Percentage of financed projects which underwent environmental impact assessments at the planning stage.
- Percentage of financed projects which underwent assessments regarding site-specific conditions in relation to geology and hydrology.
- Percentage of financed projects which meet high environmental standards and requirements during the construction phase (e.g. noise mitigation, minimisation of environmental impacts during construction work).

2. Environmental aspects of geothermal heating and cooling systems

Quantitative indicator:

- Percentage of financed projects for which measures to avoid contamination of soil and groundwater are in place (e.g. regarding borehole completion, leakage prevention, decommissioning at end-of-life).

3. Working conditions during construction

Quantitative indicator:

- Percentage of financed projects with high labour and health and safety standards for construction work and operational tasks conducted by own employees and contractors (e.g. ILO core conventions).

4. Social standards in the supply chain

Quantitative indicator:

- Percentage of financed projects for which high labour standards are applied in the supply chain (e.g. ILO core conventions).

Controversies

- Description of controversial projects (e.g. due to accidents, adverse biodiversity impacts).

Hydro power (micro-hydro systems in water supply infrastructures)

1. Consideration of environmental aspects during planning and construction

Quantitative indicator:

- Percentage of financed projects which meet high environmental standards and requirements during the construction phase (e.g. noise mitigation, minimisation of environmental impact during construction work).

2. Working conditions during construction and maintenance work

Quantitative indicator:

- Percentage of financed projects which provide for high labour and health and safety standards for own employees and contractors (e.g. ILO core conventions).

3. Environmental aspects of micro-hydro systems in water supply infrastructures

Quantitative indicator:

- Percentage of financed projects which feature measures to reduce nuisances from the water distribution system (e.g. leakage prevention, prevention of water loss and pipe bursts, adaptation measures to water pressure).

Controversies

- Description of controversial projects (e.g. due to labour rights violations, environmental accidents, adverse biodiversity impacts).

C. Pollution prevention and control

Wastewater treatment facility

1. Consideration of environmental aspects during planning and construction

Quantitative indicators:

- Percentage of financed projects which underwent environmental impact assessments at the planning stage.
- Percentage of financed projects which are not located in key biodiversity areas (e.g. exclusion of Ramsar sites, UNESCO Natural Word Heritage, IUCN protected areas I-IV).
- Percentage of financed projects which meet high environmental standards during the construction phase (e.g. noise mitigation, minimisation of environmental impacts during construction work).

2. Environmental impacts of wastewater treatment facility

Quantitative indicators:

- Percentage of financed projects which feature measures to prevent leakage of sewerage systems (e.g. monitoring systems, adequate maintenance and repair).
- Percentage of financed projects which feature measures to reduce the environmental impacts of sewage sludge disposal (e.g. exclusion of introduction into waterways and landfill, exclusion or standards for agricultural use, utilisation of energy).
- Percentage of financed projects which provide for high standards regarding the quality of treated water.

3. Community dialogue

Quantitative indicator:

- Percentage of financed projects which feature community dialogue as an integral part of the planning process and construction phase (e.g. sound information of communities, community advisory panels and committees, surveys and dialogue platforms, grievance mechanisms and compensation schemes).

4. Working conditions during construction and operation

Quantitative indicator:

- Percentage of financed projects which provide for high labour and health and safety standards for own employees and contractors (e.g. ILO core conventions).

Controversies

- Description of controversial projects (e.g. due to accidents, adverse biodiversity impacts).

D. Public transport

Public transport vehicles

1. Consideration of environmental aspects at manufacturing sites (only applicable for newly produced vehicles)

Quantitative indicators:

- Percentage of financed vehicles produced at manufacturing sites that have a comprehensive environmental management system in place.
- Percentage of financed vehicles produced at manufacturing sites that properly manage direct and indirect carbon emissions (through e.g. inventories, targets and action plans).
- Percentage of financed vehicles produced at manufacturing sites where substances of concern are strictly limited in production processes.

2. Working conditions at manufacturing sites (only applicable for newly produced vehicles)

Quantitative indicators:

- Percentage of financed vehicles produced at manufacturing sites that have a comprehensive health and safety management system in place.
- Percentage of financed vehicles produced at manufacturing sites where high labour standards are guaranteed (e.g. ILO core conventions).

3. Environmental aspects of vehicles

Quantitative indicators:

- Percentage of financed vehicles for which comprehensive life-cycle-assessments have been conducted.
- Percentage of financed vehicles for which material efficiency and the use of recycled materials is considered during product design.
- Percentage of financed vehicles for which recyclability at end-of-life stage has been considered during design and construction.
- Percentage of financed vehicles for which energy efficiency during operation is optimised (e.g. through energy recovery systems).

4. Social aspects of vehicles

Quantitative indicator:

- Percentage of financed vehicles which ensure health and safety for both passengers and operators (e.g. vigilance control, minimisation of noise exposure).

5. Social standards in the supply chain (only applicable for newly produced vehicles)

Quantitative indicator:

- Percentage of financed vehicles for which manufacturers require high labour standards in their supply chain (e.g. ILO core conventions).

Controversies

- Description of controversial projects (e.g. due to labour rights violations, accidents, adverse biodiversity impacts).

E. Adaptation to climate change

Flood prevention (no dams)

1. Consideration of environmental aspects during planning and construction

Quantitative indicators:

- Percentage of financed projects which underwent environmental impact assessments at the planning stage.
- Percentage of financed projects which meet high environmental standards and requirements during the construction phase (e.g. noise mitigation, minimisation of environmental impact during construction work).

2. Working conditions during construction and operation

Quantitative indicator:

- Percentage of financed projects which provide for high labour and health and safety standards for own employees and contractors (e.g. ILO core conventions).

3. Modelling on natural state of water bodies, scientific monitoring, structural quality mapping

Quantitative indicator:

- Percentage of financed projects for which the relevant plans are scientifically monitored and are modelled on the natural state of the water body.

4. Community dialogue

Quantitative indicator:

- Percentage of financed projects which feature community dialogue as an integral part of the planning process and construction phase (e.g. sound information of communities, community advisory panels and committees, surveys and dialogue platforms, grievance mechanisms and compensation schemes).

5. Social standards in the supply chain

Quantitative indicator:

- Percentage of financed projects for which high labour standards are applied in the supply chain (e.g. ILO core conventions).

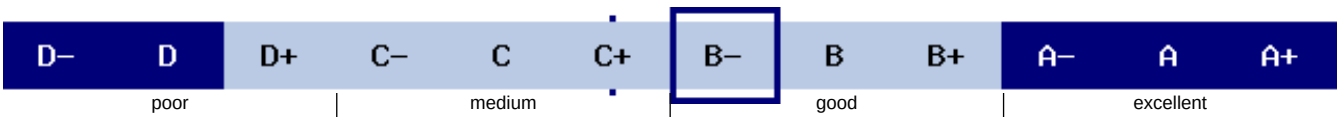
Controversies

- Description of controversial projects (e.g. due to accidents, adverse biodiversity impacts).

oekom Country Rating

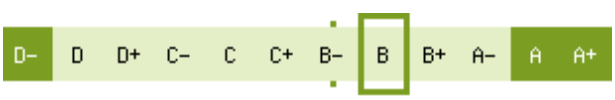
Japan

Score	**50.73%**	Status	**Prime**
Rank	**27 out of 57**	Rating	**B-**

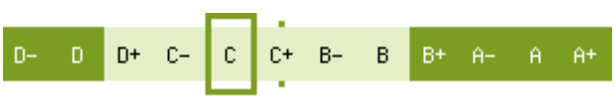


- A country is being classified as Prime if it ranks among the world's best countries and fullfills the minimum requirements defined by oekom research (best in class).
- The highlighted sections on the rating scales indicate the range of ratings achieved. The average rating is marked with a vertical line.
- If relevant information is not made available, it may result in a poorer rating of the country within the applied rating method.

Social Rating	**50%**	**B**
	Weight	Rating



Environmental Rating	**50%**	**C**
	Weight	Rating



Strengths and Weaknesses

Social Rating

Political System and Governance
+ relatively high political stability
+ high level of government effectiveness
- high level of financial secrecy

Human Rights and Fundamental Freedoms
+ human rights generally respected
– application of the death penalty for ordinary crimes
– insufficient gender equality

Social Conditions
+ conditions of employment
+ comparably low youth unemployment rate
– relatively high dependency ratio

Environmental Rating

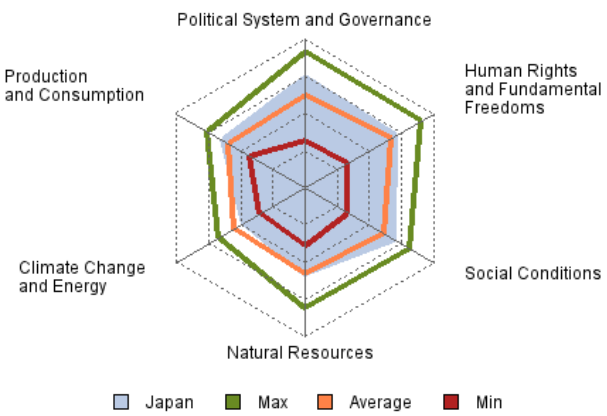
Natural Resources
– high number of threatened animal species
– high share of sealed area

Climate Change and Energy
– inadequate national and international climate policy
– renewables constitute low share of energy mix

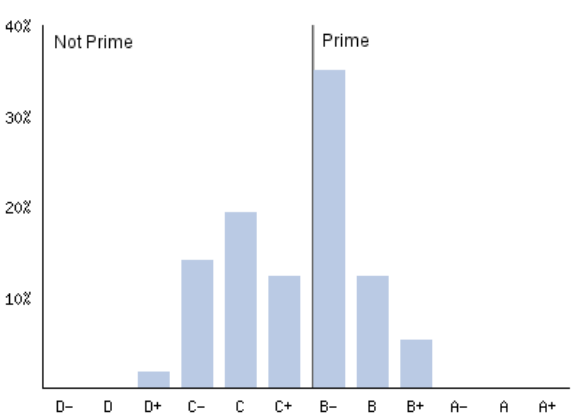
Production and Consumption
+ no use of genetically modified crops in agriculture
+ high level of material productivity
+ environmentally favourable modal split in passenger transport

Benchmark Results

Rating Categories



Breakdown of Ratings



Japan

Country Profile

National territory (2016):	377,947.00	[in km2]
National territory II (2016):	37,794.70	[in 1,000 ha]
National population (2016):	126,702.00	[in 1,000]
Population density (2016):	335.24	[persons / km2]
Average annual population change (2015):	-0.14	[as % of national population]
Human Development Index (2015):	20.00	[Rank]
Unemployment rate (2015):	3.40	[as % of labour force]
GDP per Capita (2016):	38,343.00	[in USD (PPP) per capita]
Real GDP growth (2015):	0.60	[in %]
Consumer prices (2015):	0.20	[in %]
Budget deficit (2014):	-6.20	[as % of GDP]
General government gross debt (2014):	249.10	[as % of GDP]
Current account balance (2015):	3.30	[as % of GDP]

Exclusion Criteria

	Yes	No		Yes	No
Authoritarian Regime	☐	☒	Freedom of Speech and Press	☐	☒
Child Labour	☐	☒	Human Rights	☐	☒
Climate Protection	☒	☐	Labour Rights	☐	☒
Corruption	☐	☒	Military Budget	☐	☒
Death Penalty	☒	☐	Money Laundering	☐	☒
Discrimination	☐	☒	Nuclear Power	☐	☒
Euthanasia	☐	☒	Nuclear Weapons	☐	☒
Freedom of Association	☐	☒	Whaling	☒	☐

Comments

An overview of the way in which the individual exclusion criteria are applied in practice can be found at www.oekom-research.com.

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