

A close-up photograph of several green leaves covered in water droplets, set against a dark background. The leaves are vibrant green, and the droplets are clear and glistening. The overall tone is fresh and natural. There are some white geometric lines overlaid on the image, creating a modern, abstract feel.

Nordic Public Sector Issuers

Position Paper on Green Bonds Impact Reporting

February

2020

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Introduction and purpose

This document has been developed as a practical guide on impact reporting for Nordic public sector green bond issuers. For this reason, a certain level of technical detail cannot be avoided. This version, dated February 2020, is the third edition of the Position Paper, following the inaugural and second editions published in 2017 and 2019, respectively. The material changes between the previous edition and this one are introduced on page 7.

We, the signatories, are a group of Nordic public sector green bond issuers¹ which established joint common work on impact reporting in 2016, thus complementing efforts by a group of international financial institutions, as documented in the IFI Harmonized Framework for Impact Reporting² (IFI Harmonized Framework). The Nordic Investment Bank and two investment banks³ have acted as our advisors.

The document primarily targets persons engaged in impact reporting in issuer organizations, such as environmental officers, sustainability analysts and investor relations specialists. We believe that a common Nordic position to the issues discussed may be beneficial to other issuers and are confident that by sharing experiences and know-how we can all benefit. We trust it is of interest and value to investors, as it gives an overview of the reporting commitments made by this group of green bond issuers.

We recognize the need to strike a balance between

- a) a commitment to deliver impact reporting at a certain, manageable level and
- b) absolute, detailed and fully verifiable numbers on project level and in the local context.

Notwithstanding the technical necessities involved in reporting adequately on impact from projects financed with green bonds, issuers should strive to report project information also in the context of how they contribute to the transformation to a low-carbon and resilient future, and other important environmental challenges. Issuers are therefore encouraged to position the information within the context of the issuer's overarching objectives and/or processes relating to environmental sustainability and to the Sustainable Development Goals (SDGs)⁴. Issuers may also consider reporting contributions to the EU Environmental Objectives⁵.

We advise issuers to consult the Green Bond Principles, which capture the spirit of green bonds issuance and also provide guidance on green bonds impact reporting⁶. The proposal for an EU Green Bond Standard⁷, developed by the EU Technical Expert Group on Sustainable Finance (TEG) also provides a preliminary view of expected future reporting requirements.

To date, mitigation projects dominate the green bond portfolios of Nordic public sector issuers. The structure of this document is influenced by this fact. However, an integrated approach towards adaptation and mitigation is encouraged.

¹ Participants (DK=Denmark, FI=Finland, NO=Norway, SE=Sweden): City of Gothenburg (SE), Kommunalbanken (NO), Kommuninvest (SE), Municipality Finance (FI), Municipality of Lund (SE), Municipality of Norrköping (SE), Municipality of Örebro (SE), Region Skåne (SE), Region Stockholm (SE), Swedish Export Credit Corporation, SEK (SE). Kommunekredit (DK) and Municipality of Västerås (SE) participates in the group observers, with the intention to comply with the positions of this paper at a later stage. In addition, Municipality of Borås and Swedish Association of Local Authorities and Regions (SALAR) have participated in the development work, as representatives of the Kommuninvest Green Bonds Environmental Committee.

² International Financial Institutions (IFIs): Green Bonds, Working Towards a Harmonized Framework for Impact Reporting, December 2015. The IFI Harmonized Framework Impact Reporting Handbook is available at the Green Bond Principles Resource Centre at icmagroup.org

³ Crédit Agricole CIB and SEB.

⁴ "Transforming our world: the 2030 Agenda for Sustainable Development", <http://www.un.org/sustainabledevelopment/sustainable-development-goals/>

⁵ As outlined in the "Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of a framework to facilitate sustainable investment", COM (2018) 353 final.

⁶ The Green Bond Principles, including the "Handbook - Harmonized Framework for Impact Reporting, June 2019 are available at www.icmagroup.org

⁷ EU Technical Expert Group on Sustainable Finance "Report on EU Green Bond Standard", June 2019

The position paper is a work in progress, and it can be expected to develop over time. We encourage feedback and will seek to develop our methodology to provide as relevant and appropriate impact reporting as possible.

While we strive to deliver reporting that is possible to compare and aggregate between issuers, we recognize the challenges related to different methodologies and metrics being used. Hence, we suggest caution to be exercised when such comparison or aggregation is undertaken.

This document is focused on environmental benefits, notwithstanding the potential social co-benefits that investment projects financed through green bonds may bring. As this paper outlines, issuers may choose to add social impacts in their reporting if feasible and relevant.

Issuers that aim to comply with the recommendations of this updated position paper, published in 2020, are encouraged to reflect them at the latest as of their impact reporting for the 2020 calendar year.

The joint harmonization work on impact reporting among Nordic public sector issuers has been coordinated by Kommuninvest. Parties interested in supplying comments or questions to the signatories are invited to contact Kommuninvest at: sustainability@kommuninvest.se

Acknowledgements

The signatories wish to express their gratitude to Crédit Agricole CIB, Nordic Investment Bank and SEB, for advisory assistance during the development of this position paper. We are also thankful for input received during previous consultations held with investors including Actiam, Affirmative Investment Management, AP2, KfW, Mirova, NN Investment Partners and Storebrand, and second opinion providers, represented by Center for International Climate Research (CICERO).



MuniFin



SEK

Region Stockholm



A close-up photograph of a pine branch with vibrant green needles. The needles are sharp and pointed, arranged in clusters along a dark brown stem. The background is a deep, dark green, creating a strong contrast with the lighter green of the needles. The lighting is soft, highlighting the texture of the needles.

Summary

Summary

General reporting principles

Reporting format

- In their impact reporting, issuers are recommended to include a summary of their green bond and green investment activities. An executive summary template is available in Appendix C.
- In addition to the traditional impact report, issuers are recommended to publish the project information presented in or used for the report also in spreadsheet format, which can be downloaded by interested parties from the issuer's website.

Annual reporting based on annual impact

- Annual reporting recommended for dynamic portfolios. For non-dynamic portfolios, issuers are also encouraged to report annually, but may choose a simplified approach (for instance, a confirmation of status quo).
- Report annual impact (as opposed to life-time results). Issuers may choose to add life-time perspective when relevant.
- Report on impact as long as there are green bonds outstanding.

Report based on the share financed

- Report on the basis of the share of the project's total investment cost that the issuer has financed with green bonds.
- Report impact based on amounts disbursed and outstanding to a project (as opposed to amounts committed).

Report impact per monetary unit when quantifiable and relevant

- Report CO₂-reduction and other quantified impact per invested monetary unit solely for investments made in projects or project categories where such impact is relevant.

Report bond-by-bond or on bond programme basis

- For non-dynamic portfolios, impact should be reported in relation to the respective green bond(s).
- For dynamic portfolios financed with multiple bond issuances, issuers shall provide a breakdown of impact attributable to each bond, typically using a simple pro-rata allocation. A template is found in Appendix C.

Report net benefits based on expected impact

- Report expected impact (ex-ante), and strive to report on actual impact (ex-post). If reporting includes both ex-ante and ex-post impact data, a clear distinction should be made.
- Distinguish between reduced and avoided CO₂ emissions. In this document, reduced energy is defined as a direct or absolute reduction in operation; avoided energy use refers to a baseline/alternative reference scenario.
- Highlight methodologies used and the uncertainty of environmental data to reader
- Report net benefits, comparing projects to relevant reference scenarios (see project category recommendations)

Focus on environmental impact

- Issuers shall report on direct climate-related/environmental impacts such as renewable energy production, energy savings, reduced greenhouse gas emissions, increased resilience, environmental operations and infrastructure etc.
- Issuers may choose to add social and/or economic impacts when deemed feasible and relevant.

Report at geography and sector level

- For issuers with projects located in multiple jurisdictions, it is recommended that disbursements and impacts are reported both at geography and sector level, e.g. geographical distribution of wind sector investments.

Environmental impact methodology

Project boundary and scope of emissions

- Greenhouse gas calculations should include all related activities, facilities or infrastructure that the issuer is financing.
- Report on Scope 1 and Scope 2 emission reductions as defined by the Greenhouse Gas Protocol.
- Reporting projects' impact on other indirect emissions, defined as Scope 3, is a desirable future development and may be considered once more widely accepted life cycle analysis methodology is available.

CO₂ baseline for electricity

- European mainland mix including Norway is recommended as the default baseline emission factor for electricity, for projects located in the European Union and Norway.
- Factor calculated as Combined Margin according to IFI Harmonized Framework methodology⁸, combining a Build Margin and Operating Margin. Same combination of Build Margin (50%) and Operating Margin (50%) used for all electricity projects.
- Combined Margin to be applied: 315 g CO₂/kWh. This baseline is to be updated regularly, subject to availability of data.

CO₂ baseline for district heating

- Issuers should choose a baseline that is relevant and that reflects the national/local situation.
- Swedish issuers may draw on the methodology as outlined in Appendix C.

Material changes compared with the previous (2019) version

- The baseline emission factor for electricity has been revised downwards, from 380 g CO₂e/kWh to 315 g CO₂e/kWh, based on updated grid factors in the underlying dataset provided by the IFIs. See #23 and Appendix A, including visualization of alternative baselines on page 39.
- Certain amendments and additions have been made to reflect the proposed EU Green Bond Standard (EU GBS) and the Taxonomy of environmentally sustainable activities, developed as part of the EU Sustainable Finance Action Plan. While the EU GBS and the Taxonomy are not yet in force when this position paper is published, the following recommendations have been added to accommodate the suggested requirements:
 - Provide both allocation and impact reporting.
 - Report a breakdown of projects by the nature of what is being financed (tangible or intangible assets, capital expenditures, operating expenditures, working capital, public expenditures), and by geography and sector level.
 - Distinguish between financing and refinancing, at least according to the EU Green Bond Standard, but also verifying any financing/refinancing commitments made in the issuer's Green Bond Framework.
 - Consider reporting contributions to the EU Environmental Objectives. To this end, the mapping vs. the Sustainable Development Goals has been expanded to capture also the EU Environmental Objectives.

⁸ International Financial Institution Framework for a Harmonised Approach to Greenhouse Gas Accounting, November 2015



Reporting principles

Reporting principles

This section outlines some of the main principles we have agreed on. Unless otherwise indicated, they will be in alignment with the core principles and recommendations as outlined in the IFI Harmonized Framework and with the voluntary guidelines for green bonds, the Green Bond Principles. They also address the TEG (Technical expert group on sustainable finance) proposal for a future EU Green Bond Standard, in particular for the distinction between allocation reporting and impact reporting⁹.

Our work has included the identification of a number of considerations relevant to impact reporting on environmental investments financed with green bonds. When mapping against the IFI Harmonized Framework we believe that items #12 (comparing projects), #13 (complex calculations) and #16 (different currencies) are of less relevance to Nordic public sector issuers and will therefore not be treated in this position paper.

We have concluded the following:

1. Report expected impact, aiming for actual impact

- Report expected impact, and strive to report on actual impact
- Reporting should include the estimated reduction in greenhouse gases, as well as other green indicators appropriate to describe environmental impact and performance
- Distinguish between reduced and avoided CO₂ emissions.
- Target net benefits, consider to report gross emissions if feasible
- Highlight methodologies used and the uncertainty of environmental data to readers

We undertake our impact reporting based on the expected environmental impact (ex-ante) from the projects we finance or co-finance¹⁰. Issuers that have the ability to provide impact reporting based on actual (ex-post) impacts, are encouraged to do so.

In their reporting, issuers should distinguish between impacts based on ex-ante and ex-post calculations.

Reporting should include both green indicators (which the project owner has control over) and resulting emissions reductions (which require certain assumptions). Green indicators, such as renewable energy produced or electricity saved, should be easy to report on with good quality. Emissions reductions should be reported if calculations can be made with satisfactory quality. If emission reductions are indirect and/or outside the scope of the project(s) financed, they should not be included. Generally, a conservative approach is recommended.

For practical reasons, issuers are, at least initially, recommended to target net benefits rather than disclosing gross emissions before and after project completion. Disclosing the full carbon intensity of portfolios, as well as the net CO₂ reduction, may be considered by issuers, if feasible. Issuers may choose to include such reporting gradually, for selected projects or project categories.

Issuers are recommended to be transparent about estimations and assumptions that may need to be made as part of the impact reporting. The report should include information about the precision of environmental data, attributable to the scientific uncertainty regarding the measurement methods, as well as uncertainties regarding the data that the measurement methods are applied to.

⁹ EU Technical Expert Group on Sustainable Finance “Report on EU Green Bond Standard”, June 2019

¹⁰ A significant share of the use-of-proceeds from green bonds are typically directed at investment projects that are either planned or in the process of completion. Therefore, actual impact data is typically not available to issuers in the project selection and verification phase.

2. Report based on annual impact

We commit to report impact on the projects we finance based on annual impact (as opposed to life time results). Issuers may choose to add life-time perspective when relevant.

Where projects are constructed during a prolonged time period and where expected impacts are not to be realized until far out in the future, issuers may elect to disclose the expected future timing of impact. However, this is only recommended if the project/projects are material to the green bonds issuance.

When possible, reporting should be normalized to reflect a representative year. In the case of renewable energy and green buildings normalization includes the consideration of weather-related irregularities in energy consumption or production. Normalization should be conducted in accordance with established national or international practice.

Normalization may not be applicable for all project categories, and in the case of clean transportation may be complicated, see position #30 on page 29.

3. Provide annual reporting

- Annual reporting recommended for both dynamic and non-dynamic portfolios
- Issuers should report on impact as long as there are green bonds outstanding
- Disclose reporting period and process for project inclusion
- For non-dynamic portfolios, issuers may elect more simplified approach

We undertake to report on impact as long as we have green bonds outstanding.

For dynamic portfolios, i.e. where the composition of assets financed by green bonds change on a regular basis through addition or removal of assets, reporting will be annual.

Issuers are recommended to define and disclose the period and process for including projects in their report, and to explain the key characteristics of the approach for approving projects that meet the issuer's predefined eligibility criteria.

Reporting may nonetheless consist of e.g. a list of projects on the issuer's webpage, which may not need amendments for several years unless input variables change (e.g. disbursements / repayments / baselines / estimates vs actual etc.).

For non-dynamic portfolios or projects where allocation is complete and no new additional information has arisen since previous reporting, it is recommended to provide annual reporting. Issuers may however elect a simplified approach (for instance, a confirmation of status quo; an update on the progress of project implementation; or a recalculation on impact due to updated baseline emissions factors).

4. Provide quantitative and qualitative reporting

Recognising the wishes of the investor community for relevant quantitative information, issuers are encouraged to provide quantitative reporting as far as possible. However, both qualitative and quantitative perspectives may be appropriate and should be reported upon depending on the type of project financed and the availability of information.

Suggested core indicators can be found in the eight respective project categories, starting on page 24.

5. Focus on environmental impact

This position paper deals with reporting environmental impact related to projects financed through green bond issuance. We have attempted to include recommendations regarding a range of project categories, including renewable energy, green buildings, energy efficiency, clean transportation, waste management, water and wastewater management, and sustainable land use/environmental management.

We commit to reporting on environmental impacts in our annual green bond investor reporting.

However, individual issuers may choose to add social and/or economic impacts when deemed feasible and relevant. These may include, for example:

- number of jobs created and/or preserved;
- number of dwellings and/or beneficiaries for green buildings;
- number of students for green school buildings.

6. Report project-by-project, where feasible

Issuers are encouraged to report on a project-by-project basis, where feasible. We encourage aggregating to portfolio level reporting for individual project categories. However, we also recognize that some issuers for confidentiality reasons, competition considerations, a large number of underlying projects, or other may have to limit the amount of detail that can be made available on a project-by-project basis, and may thus be restricted to reporting on a portfolio basis. In these cases, issuers may want to reference an external review, which can potentially increase transparency. For green bond frameworks where no commitment is made to reporting on smaller projects, i.e. projects below a defined investment size, project-by-project reporting is not required.

7. Report based on the share financed

- Report impact attributable to the share of the project's total investment cost that the issuer has financed with green bonds
- Report impact based on amounts disbursed and outstanding to a project (as opposed to amounts committed).

The impact report should account for the expected annual environmental impact realised through projects to which green bond proceeds have been allocated and disbursed. The reported impact of a project should reflect the share of the total investment cost the issuer has financed through the green bond issuance. The total investment cost may be subject to change but should be reported as accurately as possible. Generally, a conservative approach to impact calculation is recommended.

In some cases, it may be relevant to take into account the full environmental benefit of an investment, even though additional investments by other parties are required to reap such benefits. One relevant example is an investment in infrastructure to support electrical vehicle transports, such as electrical charging posts, where the full environmental benefit requires investments also by vehicle owners. Another example is additional production of renewable energy, where additional grid investments may be required.

In such cases, issuers should strive to ensure that double-counting of environmental benefits is avoided. This also underlines the importance of including in the reporting not only emissions reductions, but also the project-specific green indicators.

For conservative purposes, it is recommended to report impact based on amounts disbursed to a project (as opposed to amounts committed). If disbursements are made gradually, environmental impact will also be taken into account gradually. The same logic applies for amortisations. Amortisations will gradually reduce the issuer's reported environmental impact of a project, while at the same time freeing up capacity to finance new projects with potential for incremental impact to the portfolio. In other words, projects to which funds are no longer outstanding should not be included in the impact reporting, even if the project is still operating.

8. Report impact by \$ only when quantifiable and relevant

- Report CO₂-reduction and other impact per invested monetary unit solely for investments made in projects or project categories where such impact is quantifiable and relevant

We recognize the desire of the investor community for clear and simple metrics to evaluate green bonds.

One such measure is the CO₂ impact of an investment in relation to the invested monetary unit, i.e. X kg of CO₂ avoided annually per invested USD (or other relevant currency). While this measure makes it easy to compare green bond issues against each other, it may create a false sense of quantitative rigor, as such an approach puts faith in the precision of numbers related to uncertain environmental calculations, which in many cases are performed ex-ante.

Such an approach may also fail to recognize that some green bond frameworks are broad in scope, targeting environmental project categories that do not provide impacts measurable in CO₂. This could, for instance, be climate change adaptation and water management projects or sustainable buildings that have other significant environmental values apart from the CO₂ reduced/avoided. For certain projects, the major efficiency-enhancing investments may have been made already, thus increasing the marginal cost for additional improvements.

Issuers are therefore recommended to report CO₂ impact per invested monetary unit solely for the share of investments in projects or project categories where such impact is quantifiable and relevant. The share of total investments for which this reporting is made should be clearly stated. If an issuer's entire portfolio consists of projects where the CO₂ impact is measurable, the issuer may communicate impact per monetary unit in relation to all portfolio investments. When relevant, other metrics can be reported on in relation to invested monetary unit such as added capacity of renewable energy or energy savings in kWh per invested USD.

9. Report bond-by-bond or on bond-programme basis

All projects to which funds are outstanding should be included in the reporting regardless of whether the funds were disbursed during the year of reporting or at a prior date.

For non-dynamic portfolios where allocation is complete, each outstanding green bond will finance a designated sub-portfolio of projects. In such cases, the impact report should clearly state the estimated impact of each sub-portfolio/bond. Reported impact data should preferably and if feasible also be aggregated for all outstanding green bonds, so that is possible to associate all bonds from the same issuer with one aggregated set of impact results. Using the aforementioned approaches should serve to meet reporting demands both from investors which prefer impact reporting data relevant to the specific bond that they have purchased as well as from investors who prefer an aggregated approach.

For dynamic portfolios where the composition of projects financed by the outstanding green bonds changes on a regular basis through addition or removal of assets, issuers may instead choose to report impact on a portfolio basis. Such reporting can either assess the impact of the green projects to which disbursements have been made during the reporting year, or the impact of the aggregate portfolio of eligible assets as of the reporting date.

For such dynamic portfolios, issuers shall provide a breakdown of impact attributable to each bond, typically using a simple pro-rata allocation of aggregated impact to each outstanding bond. A template for reporting specific bond impact is found in Appendix C, see table "Impact attributable to green bond investors".

10. Provide both allocation and impact reporting

- Allocation reporting is a necessary first step to present impact reporting
- Both allocation and impact reporting are intimately linked, should use the same methodology and should be presented together, in a consistent manner.

In accordance with the proposed EU Green Bond Standard, reporting should include information on the proceeds raised by the green bond and information on the amounts allocated to projects (the "allocation reporting"). It is recommended that such allocation reporting is verified by an independent external verifier to guarantee, on an annual basis until full allocation, the actual allocation of use of proceeds.

Reporting should also provide information on the actual environmental and social impacts of the project financed by the green bond (the "impact reporting"), which is the actual purpose of this position paper. Both allocation and impact reporting are intimately linked, should use the same methodology and be presented together, in a consistent manner.

11. Distinguish between financing and refinancing

- Report on the share of financing and refinancing, at least according to the proposed EU Green Bond Standard

Issuers are recommended to report on the share of financing and refinancing according to the proposed TEG EU Green Bond Standard (EU GBS). Issuers should also verify any financing/refinancing reporting commitments in their own Green Bond frameworks, and report on these if they deviate from the EU GBS requirements.

The EU GBS request issuers to report on a) the share of financing (i.e. the allocated amount to projects financed after bond issuance) and b) the share of refinancing (i.e. the allocated amount to projects financed before bond issuance).

For issuers who find that the EU GBS reporting requirements regarding financing and refinancing are not directly applicable to their issuance model, and which lack a financing and refinancing reporting commitment in their own frameworks, a complementary reporting alternative is outlined below. It may suit issuers following a bond programme/portfolio approach.

This complementary alternative, which is entirely voluntary, is to report a) the share of financing based on the allocated amount to projects during the year of reporting and b) the share of refinancing based on the allocated amount to projects financed before the year of reporting.

Issuers may elect to include in such reporting information also on the average physical age of the projects, based on the year of completion, and, if relevant, the maturity profile of any associated financing, such as Green Loans.

Issuers should seek to demonstrate that the refinancing of existing projects is directly linked to the issuer's sustainability objectives.

In the case of financing of future projects, issuers are recommended to provide transparency on the disbursement timeline. Issuers are however recommended to report impact only from projects to which funds are disbursed and outstanding at the time of reporting, see Principle #7.

12. Provide breakdowns on asset type, geography and sector

- Report a breakdown of projects by the nature of what is being financed, and also by geography and sector level.

In line with the proposed reporting requirements for EU Green Bonds, issuers are recommended to provide a breakdown of allocations by the nature of what is being financed (tangible or intangible assets, capital expenditures, operating expenditures, working capital, public expenditures).

It is also recommended that disbursements and impacts are reported at geography and sector level. For issuers with projects located in multiple jurisdictions, reporting should be done at geography and sector level combined.

13. Maximize transparency and useability

- Publish impact reports and other relevant information at a single access point on the issuer website
- Aggregate information or data on individual projects to the bond level or project category level
- Structure and present overarching data early on in reports
- Incorporate an executive summary, which summarizes green bond and green investment activities, early on in reports
- Make project information used for the impact report available in spreadsheet format
- Evaluate whether aggregation platforms for impact reporting can be used to maximize transparency and useability

Impact reporting is a feature of green bonds issuance that is becoming increasingly valuable for investors and other stakeholders, who may be spending a significant amount of time simply searching and aggregating such impact data.

Issuers are therefore encouraged to consider both ease of access and ease of use when they make their impact reporting data available to stakeholders. This includes, for instance, publishing impact reports and other relevant information at a single access point on the issuer website; aggregating information or data on individual projects to the bond level or project category level; and structuring overarching data in visually appealing and functional manner early on in reports.

We recommend that issuers' reporting incorporate a) an executive summary, which summarizes green bond and green investment activities, see Appendix C for a suggested example, and b) that issuers make project information presented in the impact report available also in spreadsheet format on their website.

There is an emerging trend for platforms that aggregate impact reporting data from many issuers, allowing issuers to report on green bond impacts and investors to access impact data on multiple portfolio investments from a single access point. Such developments are spearheaded both by stock exchanges and other entities. We encourage issuers to evaluate whether such platforms can be used to maximize transparency and useability.

14. Incorporate climate-related physical risks when possible

Whereas green bond investments are inherently opportunity-oriented, we recognise that green investments are also subject to risks, including physical risks related to climate change. Such risks can be related to increased severity of extreme weather events or longer-term shifts in precipitation and temperature and increased variability in weather patterns, such as sea level rise. The financial implications of physical risks on organizations may be related both to direct damage to assets and indirect impacts from supply chain disruption. Organisations' financial performance may also be affected by changes in water availability, sourcing, and quality; food security; and extreme temperature changes affecting organizations' premises, operations, supply chain, transport needs, and employee safety.

Normally, green bond investors are not directly exposed to the physical risk of projects financed by green bonds, since the majority of green bonds issued are standard recourse-to-the-issuer debt obligations. However, we still deem physical risk of projects financed by green bonds to be a topic that deserves attention from issuers.

As described in the TCFD recommendations¹¹. "Physical climate-related scenarios are particularly relevant for organizations exposed to acute or chronic climate change, such as those with long-lived, fixed assets; locations or operations in climate-sensitive regions (e.g., coastal and flood zones); reliance on availability of water; and value chains exposed to the above."

Issuers are encouraged to be transparent about climate-related physical risk of projects or portfolios, where these are identified. In such cases, issuers should be transparent about how these risks will be mitigated.

In addition to the TCFD guidance, issuers are also recommended to consult a report¹² published by EBRD (the European Bank for Reconstruction and Development) and the Global Centre of Excellence on Climate Adaptation.

¹¹ Task-Force on Climate-Related Financial Disclosures: "Recommendations of the Task-Force on Climate-Related Financial Disclosures, June 2017", see page 27.

¹² European Bank for Reconstruction and Development & Global Centre of Excellence on Climate Adaptation: "Advancing TCFD Guidance on Physical Climate Risks and Opportunities", May 2018

15. Report contributions to the Sustainable Development Goals (SDGs)

We recognise that the Sustainable Development Goals adopted by the United Nations in 2015 are a blueprint for sustainable development globally, and serve as a universal benchmark when developing methodologies to assess and report sustainability performance. We also acknowledge growing demand from investors to map their green bond investments to the UN SDGs.

The project categories referenced in this position paper have been mapped against the relevant SDGs, see page 17. This mapping, which is inspired by the GBP/ICMA mapping¹³ and the existing practises of Nordic issuers, relates to the specific context of projects in the Nordic countries. It may be used as a generic reference for Nordic issuers to map their Green Bond project categories to the UN SDGs. Issuers are nevertheless encouraged to adapt the mapping to their specific portfolio of assets, in the context of their overall sustainability strategy, and to include their mapping in the impact report.

16. Consider reporting contributions to the EU Environmental Objectives

One of the requirements in the proposed TEG EU Green Bond Standard is linking the use of bond proceeds to the six EU Environmental Objectives:

- i) Climate change mitigation
- ii) Climate change adaptation
- iii) Sustainable use and protection of water and marine resources
- iv) Transition to a circular economy, waste prevention and recycling
- v) Pollution prevention and control
- vi) Protection of healthy ecosystems

While waiting for a more granular *Taxonomy of environmentally sustainable economic activities* to be adopted, projects financed with an EU Green Bond should be demonstrating substantial contribution to one or more of these six objectives.

To accommodate such a demonstration through issuers' impact reports, the project categories referenced in the position paper have been mapped against the relevant environmental objectives¹⁴, see page 17. Similar to the SDG mapping, this is meant as a generic reference for issuers when conducting their own mapping based on their specific project portfolio and context.

Issuers are encouraged to draw a link between a project category and an EU environmental objective only when and if their reporting includes indicators that illustrate the projects' contributions to the same objective(s).

Providing a mapping of projects or project categories against the EU Environmental Objectives is not a firm requirement at this stage but may be included as a recommendation in the future.

¹³ Green and Social Bonds: A High-level Mapping to the Sustainable Development Goals", June 2018

¹⁴ Defined in Article 5-11 in the Taxonomy Regulation https://ec.europa.eu/info/law/better-regulation/initiative/1185/publication/238025/attachment/090166e5baea4e23_en

Mapping vs the EU Environmental Objectives and the SDGs

This suggested mapping may be adapted by individual issuers, to reflect their specific portfolio of assets and their overall sustainability strategy.

Position Paper Project Category	Primary EU Environmental Objective	Secondary EU Environmental Objective(s)	Relevant SDGs
Renewable energy	Climate change mitigation	n/a	 
Green buildings	Climate change mitigation	Climate change adaptation	   
Energy efficiency	Climate change mitigation	n/a	   
Clean transportation	Climate change mitigation	Pollution prevention and control	  
Waste management	Transition to a circular economy, waste prevention, and recycling	Pollution prevention and control Climate change mitigation	 
Water and wastewater management	Sustainable use and protection of water and marine resources	Climate change adaptation Pollution prevention and control Climate change mitigation	 
Sustainable land use / environmental management	Protection of healthy ecosystems	Climate change adaptation Climate change mitigation	  
Climate change adaptation	Climate change adaptation	n/a	  

A close-up photograph of a white flower petal, likely from a lily, with several clear water droplets resting on its surface. The background is a soft, out-of-focus gradient of blue and green. The text "Environmental impact methodology" is overlaid in white, bold, sans-serif font on the right side of the image.

**Environmental
impact methodology**

Environmental impact methodology

Reporting benefits and comparing with relevant baselines

In this section we describe the methodological choices we have made for environmental impact and the reasoning behind them, with the ambition of meeting high standards of transparency.

17. Core indicators

Issuers should strive to calculate and aggregate the impact of individual projects and project categories where this is feasible. A number of suggested impact indicators are listed in the Project category recommendations section, see below. We recognise that other indicators may be of relevance for certain projects; in such cases issuers are encouraged to use these as a complement or even substitution.

18. Baselines

Deciding upon a baseline against which the environmental impact can be measured is important, as the chosen baseline will determine the calculated environmental benefits.

This paper outlines recommended baseline approaches for certain project categories and for electricity. Issuers may choose to disclose impact relative to other relevant baselines, additionally or instead of the suggested baselines. For instance, this may be relevant for projects located outside the European Union. Issuers are recommended to be transparent about the choice of baselines, and to stay true to the general principle of conservative impact calculations.

Whenever feasible and relevant we base the suggested baselines on the IFI Harmonized Framework and their standards for GHG-accounting¹⁵. This approach is also in accordance with GHG Protocol guidelines for grid-connected electricity projects¹⁶. (See Appendix A)

19. Calculating greenhouse gas (GHG) emissions

In the absence of one single commonly-used standard for the calculation of GHG emissions reduced/avoided, issuers may follow their own methodologies while making these available to investors. Issuers are encouraged to report GHG emissions data only when they can provide full transparency on the applicable GHG accounting methodology and assumptions, which can be referenced.

20. Project boundary and scope of emissions

The project boundary for greenhouse gas calculations should include all activities, facilities or infrastructure that the issuer is financing. The Nordic issuers at this stage commit to report on Scope 1 and Scope 2 emission reductions as defined by the Greenhouse Gas Protocol.

Reporting projects' impact on other indirect emissions, defined as Scope 3, is a desirable future development and may be considered once more widely accepted life cycle analysis methodology is available. Issuers should clarify which Scope is used for the impact report.

¹⁵ <https://unfccc.int/climate-action/sectoral-engagement/ifis-harmonization-of-standards-for-ghg-accounting>

¹⁶ See "Guidelines for Quantifying GHG Reductions from Grid-Connected Electricity Projects", published by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD)

21. Energy savings vs energy reduced and energy avoided

The IFI Harmonized Framework highlights “energy savings” as a core indicator in impact reporting. We recommend further granulating this indicator into reduced and avoided energy use and CO₂ emissions. We view reduced energy use as a direct or absolute reduction in operation; avoided energy use refers to a baseline/alternative reference scenario.

When we refer to energy savings, we mean both energy reduced and energy avoided and the sum of the two. When presenting aggregated impact results, issuers are encouraged to report the total energy savings, with a break-down on energy reduced and energy avoided.

22. CO₂ baseline for electricity

- Factor calculated as a Combined Margin based on IFI Harmonized Framework methodology, combining a grid Operating Margin (OM) and a Build Margin (BM) from potential new generation capacity that is affected by the project.
- Unlike the IFI we use the same default combination of OM and BM (50%:50%) for all electricity-related projects, as a reflection of an open Nordic electricity system interconnected to neighboring northern European systems, which gives more potential to replace existing OM, and less competition with other potential BM.
- European mainland mix including the UK and Norway is recommended as the geographic grid area for the default baseline emission factor for electricity.
- Issuers are recommended to use the following resulting default baseline emission factor for electricity: **Combined Margin: 315 g CO₂/kWh**

In line with the IFI Harmonized Framework, the baseline emission factor is constructed using a Combined Margin (CM) for the electricity grid, comprised of an existing Operating Margin (OM) and a Build Margin (BM) from potential new generation capacity¹⁷.

We recommend using a Combined Margin factor of 50% OM + 50% BM for all electricity-based projects, including all renewable energy (RE) and energy efficiency/saved energy (EE). With this approach we deviate from the IFI Harmonized Framework, in order to better reflect the Nordic context. In order to simplify reporting requirements, we apply this approach also to electrification projects that lead to an increased use of electricity, e.g. transportation projects. See Appendix A for a more detailed discussion and a comparison between the Nordic issuers' approach and the IFI approach.

A baseline emission factor for Nordic green bond issuers could be chosen from several, geographically different, grid factors: project specific, local, national, Nordic, Baltic Sea region or European.

This position paper suggests an EU Mainland grid factor including the UK and Norway as the default baseline for accounting and disclosure of electricity. We have chosen this grid factor as the relevant baseline because the Nordic electricity market is already characterised by a high level of interconnection, also with neighboring countries in the Northern European region. Furthermore, the integration of European electricity markets is planned to increase in the coming years and decades, which is the relevant time perspective for most investments. A pan-European baseline is higher than one comprising only Denmark, Finland, Norway and Sweden but more conservative than one comprising the Baltic Sea Region including the three Baltic states, Germany, Poland and the Netherlands, which would reflect current grid interconnection, as detailed in Appendix A.

¹⁷ International Financial Institution Framework for a Harmonised Approach to Greenhouse Gas Accounting, November 2015

The recommended baseline emission factor for electricity is a **Combined Margin of 315 g CO₂/kWh**.

This CO₂ baseline has been calculated based on grid factors for OM and BM in a dataset (IFI Dataset of Default Grid Factors 11.05.2019) provided by the Nordic Investment Bank, one of the signatories to the IFI Framework for GHG-accounting. Available figures are generally Scope 2. Our ambition is to review this baseline emission factor on a regular basis, subject to availability of new data. We are open to future further harmonization with IFI:s, e.g. on the OM-BM relationship, as methodologies develop.

Issuers may choose another baseline, for example from a relevant local or national context, if and when this is relevant, for example if financed projects are located outside of the European Union. Issuers may also use additional baselines (such as local, Nordic and European) for informational purposes.

23. Certificates of origin

Issuers are recommended not to use certificates of origin and/or residual mix as the basis for CO₂ values. The principal reason is that we do not consider such certificates to be a main driving force for deployment of more renewable energy, in comparison with more substantial market setting policy measures such as the EU emissions trading system (EU-ETS), CO₂-taxation and the Swedish and Norwegian green electricity certificates.

24. The EU emissions trading system (EU-ETS)

With the EU emissions trading system in place, it could be previously argued that all investments covered by the system contributed to achieving the overall target and that additional reduction from one investment may effectively be levelled out by increased emissions from other projects and in other member states. However, the system has recently been modified to allow for cancellations for unused volumes, which shows that the total quotas and mechanisms of the EU-ETS is a political issue and also influenced by the actual performance of emissions reductions. We have therefore not made any distinctions between investments and emissions inside and outside the EU-ETS.

25. CO₂ emission baseline for district heating¹⁸

- No common baseline emission factor for district heating has been established
- The baseline selected should reflect the national/local situation, including the situation prior to the investment
- Swedish issuers may draw on the methodology as outlined in Appendix B

The district heating and district cooling systems are fundamentally local/regional and not interconnected on a national or Nordic basis even though the fuels used (bio, solid waste, fossil) may be often traded over long distances. Local mixes for both direct and avoided emissions are considered most relevant in impact reporting, however, issuers may choose to use a national mix to simplify reporting. One such national calculation (from Sweden) is presented in Appendix B. Please note that there is not yet any IFI harmonised approach for investments related to district heating.

One crucial question is which alternative situation to compare a district heating investment to. Issuers may consider applying a “no project” scenario as baseline when financing new district heating systems, and “the actual situation before project implementation” for investments related to expanding or improving existing systems.

The chosen baseline should reflect national/local circumstances and regulations. The calculation method should consider both emissions caused by the production of district heating, cooling, steam or combined heat and power (CHP) (including Scope 2), as well as avoided emissions from alternative sources of energy.

26. Energy units: kWh or appropriate multiples recommended

In the Nordic countries, the most commonly used energy unit is kilowatt-hours (kWh). We therefore intend to use kWh or appropriate multiples as the energy unit in our impact reporting (i.e. MWh, GWh etc. along with installed effects in kw, MW and GW, etc.).

However, issuers are recommended to include a Joule (J) conversion factor, where 1 kWh represents 3.6 MJ and 1 MWh represents 3.6 GJ. Issuers may also choose to report aggregate energy savings or added capacity in Joules, alongside Wh.

¹⁸ District heating is a system for distributing heat generated in a centralized location for residential and commercial heating requirements. In the Nordic countries, the heat is often obtained from a cogeneration plant burning principally renewable energy sources, including biomass, but plants also use waste, excess heat, and, to a minor extent, fossil fuels. District heating plants may also be used to produce electricity (combined power and heating plants, CHP), and cooling. Depending on the characteristics of the project financed by green bonds, it may fall under different project categories, such as renewable energy and energy efficiency.

An aerial photograph showing a single railway track running vertically through a dense, green forest. The track is composed of two parallel rails on a gravel bed, flanked by narrow strips of cleared ground. The surrounding forest is thick with trees, showing varying shades of green. The text 'Project category recommendations' is overlaid in white, bold font on the right side of the image.

**Project category
recommendations**

Project category recommendations

This chapter presents impact reporting recommendations specifically relevant to eight project categories that typically dominate Nordic public sector green bonds frameworks:

- Renewable energy (incl. wind, solar, hydro, wave, bioenergy, geothermal, excess heat)
- Green buildings
- Energy efficiency
- Clean transportation
- Waste management
- Water and wastewater management
- Sustainable land use / environmental management
- Climate change adaptation

This list may be updated as the universe of projects eligible for green bond funding by Nordic issuers evolves.

27. Renewable energy

Issuers are encouraged to report the impact from renewable energy investments (wind, solar, hydro, bio energy, etc.) in terms of capacity added and estimated annual production, as well as the associated amount of CO₂ avoided, according to the guidelines established by the IFIs¹⁹. We however recommend using the same Combined Margin for electricity for all types of projects (see section #22: "CO₂ baseline for electricity" above).

The emission factor to be applied when calculating CO₂ avoided depends on the type of energy replaced. 1 kWh of renewable electricity production may be reported as replacing 1 kWh of electricity from the grid, applying the grid factor suggested in section #22 (assuming zero (0) emissions net in scope 1 and 2 from renewable energy production). If the renewable energy produced replaces other forms of energy than electricity, e.g. fossil heating oil, a relevant emission factor for the substituted energy source may be applied. In such cases, issuers should be transparent about their choice of emission factor.

Issuers may also elect to report other greenhouse gas emissions that have been reduced or avoided, where relevant and applicable.

Suggested indicators

- Capacity of energy generation of plant (MW)
- Annual renewable energy generation in MWh or GWh
- Annual GHG emissions reduced/avoided, in tonnes of CO₂-equivalent

Suggested EU Environmental Objectives

Primary Objective:

Climate change mitigation

Secondary Objective:

n/a

Suggested SDGs



¹⁹ IFI Approach to GHG Accounting for Renewable Energy Projects, November 2015

28. Green buildings

- Disclose energy savings from green buildings as a net value compared to national building requirements. Alternatively, performance can be reported in comparison to a relevant reference building.
- Issuers are encouraged to disclose the building area, in square meters.
- Refurbishments and retrofits are to be compared against status pre-investment.
- Energy produced on-site may be subtracted from the energy use of the building if this is clarified in the report.
- Issuers are encouraged also to include information about materials used, the location of the building, and other features that may contribute to the environmental benefits of the project.

Energy savings from green buildings should be disclosed as a net value, based on energy use per square meter and per year, and compared to a baseline scenario in which the building complies with applicable national regulations for the respective Nordic country²⁰. Standards and methods for calculating energy use differ by country and are not easy to compare. Regarding use of baselines for savings in electricity and in district heating, see above positions #22 and #25.

Issuers are encouraged to disclose the building area, in square meters. As additional information, issuers may choose to report a green building's performance in comparison to a reference building based on e.g. the average energy performance of the national building stock, considering relevant type of building and climate zone. Reporting in relation to averages should solely be for informational purposes (not to be used in aggregation) and where relevant (for instance refurbishments of existing buildings).

Energy produced on-site (behind the meter) that is used in the building may be subtracted from the reported energy performance of the building, if this is in line with national building regulations. (A house with an energy use of 45 kWh per sq.m. with solar panels producing 5 kWh per sq.m. may be reported as having an energy performance of 40 kWh per sq.m. considering an energy production of 5 kWh per sq.m.) Issuers are in that case encouraged to separately report the energy produced on-site (that is subtracted from the energy use of the building), as well as additional energy produced on-site and exported to the grid.

In their reporting, issuers should distinguish between new buildings and major refurbishments, where the former should be compared to national building standards and the latter to the status pre-investment.

In addition to information about the energy performance and -production of a building, issuers may elect to describe other environmentally relevant features of the building, if feasible. This information may include the main material groups used in the construction, the location of the building, water intensity, waste management, any use of fossil-free construction machinery and equipment, waste management policies on the construction site, mitigation efforts related to physical climate risks, etc. Issuers are not required to calculate CO₂ impact of building materials at this stage, as these emissions are outside scopes 1 and 2.

²⁰ Calculating impact based on buildings standards, as opposed to comparing against the average for the national building stock, represents a more conservative approach to impact reporting.

Suggested indicators

- Avoided kWh/sq m, or in percentage terms (%) below national building standards
- Annual energy avoided in MWh or GWh compared to the relevant building code (for new buildings)
- Annual energy reduced in MWh or GWh compared to the pre-investment situation (for refurbishments)
- Annual energy production on-site, in MWh or GWh
- Annual GHG emissions reduced/avoided, in tonnes of CO₂-equivalents

Suggested EU Environmental Objectives

Primary Objective:

Climate change mitigation

Secondary Objective:

n/a

Suggested SDGs



29. Energy efficiency

We encourage issuers to apply the IFI Harmonized Framework approach for GHG accounting for energy efficiency projects²¹. So far we do not commit to using the IFI method for differentiating effects during remaining and prolonged lifetime for a project. We deem this a reasonable approach, given that we are committed to annual reporting and do not report on life-time effects.

Issuers should report on both the absolute reduction (in kWh or other metric) and the percentage reduction in energy use for the same output/service. Regarding use of baselines for savings in electricity and in district heating, see above sections #22 and #25.

For energy efficiency project that are part of a larger retrofitting or refurbishing project, where parts of the project cost is not directly linked to a reduction in energy use, we recommend a cautious approach. This means reporting impact (such as energy reduced) in relation to the entire project cost. An example is the refurbishment of a building that involves both energy efficiency components such as improved insulation and ventilation systems, as well as purely esthetical components such as a façade upgrade.

Suggested indicators

- Annual energy reduced/avoided in MWh or GWh (electricity) and MWh or GWh (other energy savings)
- Annual GHG emissions reduced/avoided, in tonnes of CO₂-equivalent

Suggested EU Environmental Objectives

Primary Objective:

Climate change mitigation

Secondary Objective:

n/a

Suggested SDGs



²¹ IFI Approach to GHG Accounting for Energy Efficiency Projects, November 2015

30. Clean transportation

While clean transportation projects may differ in character, the primary objective from an impact reporting perspective is to report on avoided emissions of CO₂, in comparison with an alternative scenario. What represents the most relevant alternative scenario, is likely to vary greatly depending on the local context of the project as well as the type of transport mode to be invested in.

For larger investments in transportation systems, a pre-study of the mobility situation and the related energy consumption/emissions can be helpful in order to measure the impact of the investment. Another resource to issuers may be the cost/benefit assumptions used in the project's "business case" evaluation. We do however recognize that many smaller projects may not be backed up by pre-studies and other analysis and therefore such reporting cannot always be required from issuers.

For projects involving the purchase of low-carbon vehicles, issuers are recommended to compare the emissions of the acquired vehicles with those of a comparable conventional new alternative, such as a modern fossil-fuel driven car. Calculations should be based on the same emission factor for electricity as applied e.g. to added renewable energy and energy efficiency projects, see positions #27 and #29.

Whenever possible, issuers may include reporting on other avoided GHG emissions, such as NO_x. If relevant, reporting may also include other benefits, such as noise reductions.

Issuers are encouraged to select and report on indicators that are relevant and feasible for each individual project and for their portfolio of transport investments as a whole, including but not limited to those mentioned below. These include suggested reporting metrics as outlined in a paper produced by the impact reporting working group of the Green Bond Principles, which issuers are encouraged to consult²².

Suggested indicators

- Annual GHG emissions reduced/avoided, from cars and other vehicles, due to the investment (by comparison to average emissions by km for alternative transportation)
- Number of km of new train lines, bicycle lanes etc. created
- Passenger-kilometres in new means of transportation
- Estimated reduction in car use and car kilometres the project will replace
- Project's effect on increased resilience to climate change

Suggested EU Environmental Objectives

Primary Objective:

Climate change mitigation

Secondary Objective:

Pollution prevention and control

Suggested SDGs



²² See Resource Centre for Green Bond Principles at www.icmagroup.org: "Handbook - Harmonized Framework for Impact Reporting", June 2019

31. Waste management

A number of quantitative and qualitative indicators may be relevant for impact reporting on waste management projects. Issuers are encouraged to select and report on indicators that are relevant and feasible for each individual project and for their portfolio of waste management investments as a whole, including but not limited to those mentioned below. These include metrics outlined in a paper produced by the impact reporting working group of the Green Bond Principles, which issuers are encouraged to consult²³.

Suggested indicators

- Estimate of the reduction in greenhouse gas emissions avoided as a result of the investment (See also Appendix B for an example methodology on district heating and waste treatment).
- Waste that is prevented, minimised, reused or recycled before and after the project in % of total waste and/or in absolute amount in tonnes per year.
- Annual absolute (gross) amount of waste that is separated and/or collected and treated (including composted) or disposed of (in tonnes per year. and in % of total waste)
- Number of metric tons processed in the facility
- Material recovery rate, in %
- Expected improvement in material recovery rate or other target for improved resource use
- Number of households delivering to the facility
- Energy produced (in case of biogas/waste-to-energy plant)
- Energy saving attributable to the investment
- Project's effect on increased resilience to climate change

Suggested EU Environmental Objectives

Primary Objective:

Transition to a circular economy, waste prevention, and recycling

Secondary Objective:

Pollution prevention and control

Climate change mitigation

Suggested SDGs



²³ See Resource Centre for Green Bond Principles at www.icmagroup.org: "Handbook - Harmonized Framework for Impact Reporting", June 2019

32. Water and wastewater management

A number of quantitative and qualitative indicators may be relevant for impact reporting on water and wastewater management projects. Issuers are encouraged to select and report on indicators that are relevant and feasible for each individual project and for their portfolio of water and wastewater management investments as a whole, including but not limited to those mentioned below. These include suggested reporting metrics as outlined in a paper produced by the impact reporting working group of the Green Bond Principles, which issuers are encouraged to consult²⁴.

Suggested indicators

- Annual water savings
- Annual volume of wastewater treated or avoided
- Capacity of plants being built
- Number of meters of piping/conduit laid, upgraded or replaced
- Number of person equivalents (PE) of water or wastewater the plant processes, identifying any increase that can be attributed to the investment
- Reduction of emissions into the local environment (nitrogen and phosphorous, Biochemical Oxygen Demand, etc)
- Where relevant, amount of electricity, biogas or other energy carrier expected to be produced each year, along with avoided CO₂ emissions (see above sections on electricity and district heating)
- Health metrics (such as air and water quality)
- Biological metrics: biological diversity, wildlife
- Project's effect on increased resilience to climate change

Suggested EU Environmental Objectives

Primary Objective:

Sustainable use and protection of water and marine resources

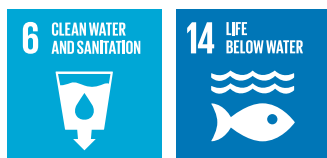
Secondary Objective:

Climate change adaptation

Pollution prevention and control

Climate change mitigation

Suggested SDGs



²⁴ See Resource Centre for Green Bond Principles at www.icmagroup.org: "Handbook - Harmonized Framework for Impact Reporting", June 2019

33. Sustainable land use / environmental management

Projects in this category are primarily intended to focus on environmental management in areas other than climate change. They may include nature conservation, biodiversity measures, sustainable agriculture, improving eco-systems, converting land from industrial/business use to wild life reserves/recreational areas etc.

For these types of projects, issuers are recommended to identify both qualitative and quantitative indicators, where qualitative measures may be of particular relevance. These may include i) surface area of the land converted (measured in square meters or square kilometers), ii) area under conversation or preservation, iii) area under certified land management (ideally with breakdown, FSC, PEFC, Rainforest Alliance), iv) monitoring of chemical use, v) biological diversity and vi) air quality. If annual energy savings and/or reduction in greenhouse gas emissions or other emissions are relevant for the project, issuers are encouraged to report on such measures as well.

Suggested indicators

- Number of species
- Number of individuals in target population
- Area reforested or converted
- Area of habitat or wetland restored

Suggested EU Environmental Objectives

Primary Objective:

Protection of healthy ecosystems

Secondary Objective:

Climate change adaptation

Climate change mitigation

Suggested SDGs



34. Climate change adaptation

The objective of projects in this category is to improve local communities' resilience in the face of a changing climate. Projects in this category may include facilities and installations to manage urban runoff, floods, landslides, avalanches, rising sea levels etc. This list is not comprehensive, as there is considerable local variance in the types of measures needed.

The resilience-enhancing qualities of a project are preferably documented through quantitative indicators, if feasible. Quantitative indicators can be complemented by qualitative descriptions of the project's characteristics and the weather-related and climate-related effects it seeks to address.

Suggested indicators

- Areas protected against heat (such as building facades) or number of heat shields etc m² or number of items of heat protection
- Areas protected against storms (building facades or land such as school yards, hospital facilities, city centres) m² or number of items
- Capacity of system or area covered, for example for water management or regarding enhanced resilience

Suggested EU Environmental Objectives

Primary Objective:

Climate change adaptation

Secondary Objective:

n/a

Suggested SDGs





Appendices

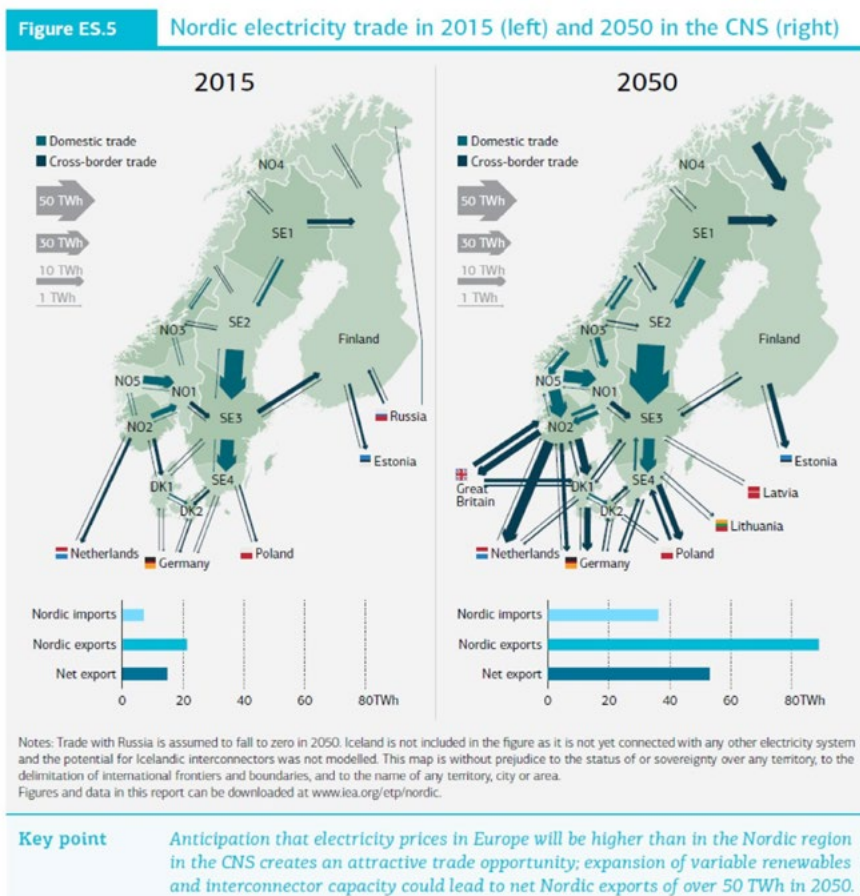
Appendix A

The Nordic electricity grid and baseline emission factors

The Nordic electricity grid

Generally speaking, a local or national mix for electricity does not exist in the Nordic countries, since electricity is widely traded cross-border with neighboring countries. Since the mid-1990s, all Nordic countries have liberalized their electricity markets, opening up both electricity trading and electricity production to competition. The highly interconnected market is the cornerstone of the Nordic energy system and is expected to serve as a key enabler for further emission reductions towards 2050.

A report published in 2016 by the Nordic Council of Ministers and the International Energy Agency (“Nordic Energy Technology Perspectives 2016), demonstrated that the Nordic electricity system had net exports of almost 15 TWh in 2015, and provided an outlook for expected interconnectedness in 2050, see figure below. According to preliminary data²⁵, imports and exports amounted to just over 17 TWh each in 2019. Net imports were recorded from Russia and Germany and net exports were recorded to Estonia, Lithuania, Poland and the Netherlands. Connections between Norway and the UK is expected to start operating in 2021.



Note: CNS = Nordic Carbon-Neutral Scenario;
 VRE=Variable Renewable Energy; CCS=Carbon Capture and Storage
 Source: Nordic Energy Technology Perspectives (NETP) 2016

²⁵ Swedenergy – Energiföretagen Sverige, "Kraftläget", sum of 52 weeks in 2019.

Baseline emission factors for the electricity grid

Whenever feasible and relevant we base the suggested baselines on the IFI Harmonized Framework and their standards for GHG-accounting (IFI Framework for GHG-accounting).²⁶ This approach was initially developed for projects associated with the Clean Development Mechanism and is supported by GHG Protocol guidelines²⁷.

It should be noted that these methods are based on a consequential assessment, aiming to describe how environmentally relevant flows will change in response to possible decisions - in this case the effects of investment projects on emissions from the electricity grid margin. This can be contrasted with the attributional or accounting assessment, that is concerned with attributing a relevant share of the global environmental burdens that belong to an existing organization or activity, based on average data and typically used for annual reporting.²⁸

Developing a Combined Margin

According to the IFI Framework for GHG-accounting, the baseline emission factor is constructed using a Combined Margin (CM) for the electricity grid, comprised of an existing Operating Margin (OM) and a Build Margin (BM) from potential new generation capacity.

The OM represents the marginal generating capacity in the existing dispatch hierarchy that will most likely be displaced by the project. The BM is calculated based on an assessment of planned and expected new capacity generation of the grid, projected over the next 8 years under the New Policies Scenario (NPS) of the most recent IEA World Energy Outlook. This BM is a mix of renewable and fossil production, depending on regions, starting points of grids and GDP/capita. For most grids, the present OM has a much higher emission factor than the expected BM.

When adding new generation capacity to a grid, this is assumed to only partly replace existing generation capacity on the margin (OM), since it is likely that in the absence of the project implementation, other generation projects would at least to some extent be implemented to meet the demand for power (BM). Introducing relative weightings to the OM-BM is used for simplification and as a proxy to estimate a Combined Margin (CM), to avoid undue and costly simulations on the effects of investments in the grid system.

The IFI's deploy two versions of the CM. For variable renewable energy generation (e.g. wind and solar PV), the weighting is 75% OM + 25% BM. For firm renewable energy generation (e.g. hydropower, concentrated solar power, geothermal and biomass) and for energy efficiency projects, the weighting is 33% OM + 67% BM. These CM's were established in a July 2019 revision, in which the CMs for firm renewable electricity generation and energy efficiency projects were changed from their previous default weights of 50 % OM + 50 % BM.

This means that the IFI method now assumes that new projects for energy efficiency and firm renewable energy are more in competition with alternative new investments (BM) than with the existing OM of the grid. On the other hand, the IFI method credits variable renewable electricity generation with 75% OM + 25% BM. The resulting higher CO₂ displacement value is given because variable energy is less likely to displace alternative new investment in capacity that is also available at peak load times.

²⁶ <https://unfccc.int/climate-action/sectoral-engagement/ifis-harmonization-of-standards-for-ghg-accounting>

²⁷ See "Guidelines for Quantifying GHG Reductions from Grid-Connected Electricity Projects", published by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). See <https://www.wri.org/publication/guidelines-quantifying-ghg-reductions-grid-connected-electricity-projects>

²⁸ See "Attributional and Consequential Life Cycle Assessment", 2019, authored by Tom Ekvall, IVL Swedish Environmental Research Institute: <https://www.intechopen.com/online-first/attributional-and-consequential-life-cycle-assessment>

Appropriate Combined Margin weightings for the Nordic electricity system

During the revision of this paper we have been in dialogue with the EIB and NIB representatives of the IFI approach, concerning the Combined Margin assumptions and the merits of harmonization. For now, we have resolved to stick to our position of partially deviating from the IFI approach, for simplification purposes and in order to better reflect the Nordic electricity system. We are however open for future further harmonization with the IFI:s as methodologies develop.

We view the above IFI assumptions on the CM to be better aligned with “closed” electricity systems, where, implicitly, there is a fixed level of older (non-BM) production. For highly integrated electricity markets, such as the Nordic electricity system, which has a high and increasing level of interconnection also to neighboring northern European countries, the prerequisites are different in our view. The northern European electricity system also has excess capacity, which combined with existing political ambitions to expand renewable energy should result in new investment contributing to more rapid closing-down of older fossil-based energy plants.

We would expect this to result in potential for more projects that can affect and replace the OM of the (entire) grid, and less be in competition with other potential projects (BM).

We therefore recommend using a Combined Margin factor of 50% OM + 50% BM for all electricity-based projects, including all renewable energy (RE) and energy efficiency/saved energy (EE). This approach also avoids giving more credit to variable energy generation, even though such generation is less likely than firm renewable energy generation and energy efficiency projects to displace older and fossil-rich capacity that is also available at peak load times. In using the same factor for energy efficiency and renewable energy we also believe we are aligned with the principle of “Energy Efficiency First”, advocated by the EU Commission.

In order to simplify reporting requirements, we apply this approach also to electrification projects that lead to an increased use of electricity, e.g. transportation projects. We believe the use of a single factor also will simplify for issuers and investors wishing to deploy own alternative emission factors.

Combined margin applied by the Nordic Issuers

We recommend using a grid factor based on EU Mainland (EU 27 excluding Malta and Cyprus) and the UK and Norway as the default baseline emission factor for accounting and disclosure of electricity. We believe this is the relevant baseline because the Nordic electricity market is already characterized by interconnection and export surplus. Furthermore, the integration of European electricity markets is planned to increase in the coming years and decades, which is the relevant time perspective for most investments (see figure on page 35).

For now, we apply the following baseline emission factor for electricity:

Combined Margin: 315 g CO₂/kWh

→ = 50% Operating Margin (476 g CO₂e/kWh) + 50% Build Margin (154 g CO₂e/kWh)²⁹

This CM grid factor corresponds to the geographic area of EU25 + the UK and Norway. The baseline emission factor is to be updated on a regular basis (subject to availability of data), reflecting new grid factors and other relevant changes in conditions and assumptions.

²⁹ Calculation by Kommuninvest in November 2019, based on IFI Interim Dataset of Harmonized Grid Factors 11.05.2019, as provided by Nordic Investment Bank.

IFI harmonized framework approach³⁰ vs. Nordic issuers' approach

Type	IFI Approach	Nordic issuers' approach
Firm generation (e.g. hydropower, geothermal and biomass)	Combined Margin = 33% Operating Margin + 67% Build Margin (266 g CO ₂ e/kWh for EU25+UK&Norway)	Combined Margin = 50% Operating Margin + 50% Build Margin (315 g CO ₂ e/kWh for EU25+UK&Norway)
Variable generation (wind and solar)	Combined Margin = 75% Operating Margin + 25% Build Margin (396 g CO ₂ e/kWh for EU25+UK&Norway)	Combined Margin = 50% Operating Margin + 50% Build Margin (315 g CO ₂ e/kWh for EU25+UK&Norway)
Energy efficiency projects, avoided electricity consumption from the grid, e.g. green buildings and energy efficiency in power plants	Combined Margin in the receiving electricity grid (Depending on lifetime of existing equipment etc. For simplification) = 33% Operating Margin + 67% Build Margin (266 g CO ₂ e/kWh for EU25+UK&Norway)	Combined Margin = 50% Operating Margin + 50% Build Margin (315 g CO ₂ e/kWh for EU25+UK&Norway)
Electrification projects	Grid average (subject to discussion) (327 g CO ₂ e/kWh for EU25+UK&Norway)	Combined Margin = 50% Operating Margin + 50% Build Margin (315 g CO ₂ e/kWh for EU25+UK&Norway)

Alternative geographic boundaries

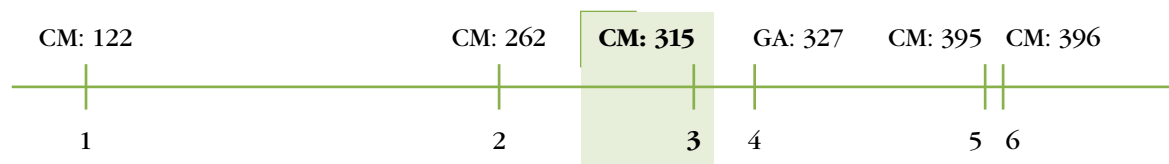
Alternative geographic boundaries could be based on production in the Nordics only (excluding Iceland) or in the Baltic Sea Region including Germany, Poland and the Netherlands. The latter would reflect current grid interconnection. Selecting a factor based on production solely in the Nordics would result in a lower baseline for electricity (122 g CO₂e/kWh) but would disregard the value of existing and expanding exports of low-carbon electricity production. On the other hand, basing the grid factor on the enlarged Baltic Sea region would result in a higher baseline (395 g CO₂e/kWh), effectively increasing the reported environmental benefits from increased renewable energy capacity or energy efficiency savings³¹.

³⁰ <https://unfccc.int/climate-action/sectoral-engagement/ifis-harmonization-of-standards-for-ghg-accounting>

³¹ Combined Margin in g CO₂e/kWh, based on 50% OM: 50% BM: Denmark 294, Finland 194, Norway 59, Sweden 63, Estonia 860, Latvia 204, Lithuania 250, Germany 458, Poland 647, Netherlands 245.

The illustration below compares alternative baselines and their relative reported environmental benefits.

Comparing alternative baselines (g CO₂e/kWh)



1: *Alternative Nordic Position Paper (Nordics only):*

CM = 50% OM + 50% BM = 122 g CO₂e/kWh

2: *IFI Harmonized Framework:*

CM = 33% OM + 67% BM = 262 g CO₂e/kWh

3: *Nordic Position Paper (EU25 + UK & Norway):*

CM = 50% OM + 50% BM = 315 g CO₂e/kWh

4: *European grid average (GA)*

(Grid average for EU25 + UK & Norway)

= 327 g CO₂e/kWh

5: *Alternative Nordic Position Paper*

(Nordics + Baltic States + Germany + Poland + Netherlands):

CM = 50% OM + 50% BM = 395 g CO₂e/kWh

6: *IFI Harmonized Framework:*

CM = 75% OM + 25% BM = 396 g CO₂e/kWh

Appendix B

Calculating impact from district heating projects

In 2017, the Swedish local government debt office Kommuninvest commissioned Profu³², an envirotech consultancy, to develop a calculation method for the net CO₂-effect for district heating in Sweden to be used in Kommuninvest's first green bonds impact report, published in March 2017.

This resulted in the development of a national-average-baseline emission factor for district heating, representing the avoided emissions from alternative heating sources. The baseline was established at 117 g CO₂/kWh (Scope 2), being a mix of avoided alternative individual heating sources using current technologies for wood pellet boilers and various types of heat pumps (20% pellet-fired boilers, 45% geothermal heat pumps/ground source heat pumps, 28% air/water heat pumps and 7% air/air heat pumps).

Since waste burning typically forms part of the energy mix in Swedish district heating plants, additional environmental benefit is ascribed to the project due to the avoidance of land fill and methane leakage, in other countries where land fill is still used.

This corresponds to 41 g CO₂/kWh as a national average for solid waste in district heating, based on a baseline emission factor of 170 g CO₂e/kWh for waste. The total baseline emission factor applied for the majority of Kommuninvest's district heating projects is therefore 158 g CO₂e/kWh.

Direct emissions are calculated from national average emissions for district heating in Sweden (which could be substituted with a factor for the local energy mix). The average 2018 was 63 g CO₂/kWh (scope 2, including 5 % fossil fuels), source: Energiföretagen.

Using a national average as a baseline factor for district heating is feasible for a portfolio of investment projects and expansion of production and supply, but local circumstances and actual changes in production mix need to be considered for projects such as energy efficiency, increased interconnection and other changes in the production mix.

³² Profu report (in Swedish only): "Stöd till klimatutvärdering av gröna investeringar inom fjärrvärmeområdet", February 2017.

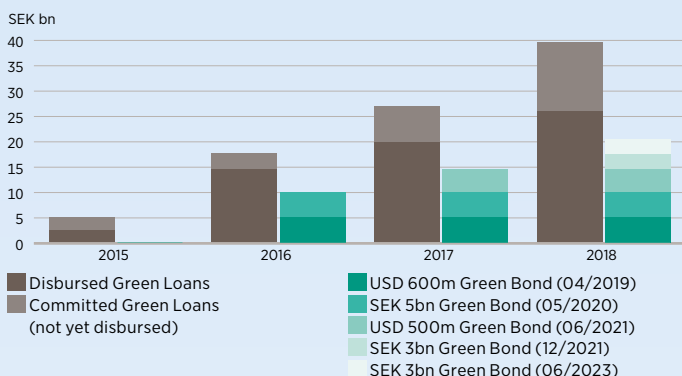
Appendix C

Executive summary template

Executive Summary

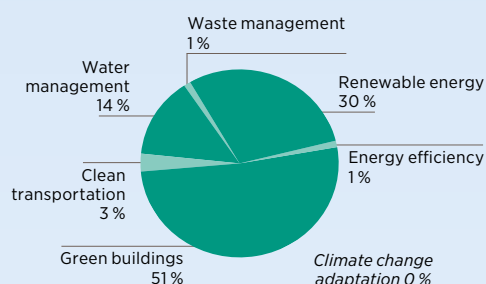
AS OF 31 DEC 2018

GREEN BONDS ISSUANCE AND GREEN PROJECT PORTFOLIO



GREEN PROJECT PORTFOLIO DISTRIBUTION

based on disbursed amounts



CO₂ IMPACT AND GREEN INDICATORS

based on outstanding disbursed amounts¹

Project category	GHG emissions reduced/ avoided, tonnes CO ₂ e/year	Outstanding disbursed amounts to projects, SEK mn	Impact, tonnes CO ₂ e per SEK mn
Renewable energy	634,446	7,878	80.5
Green buildings	4,915	13,295	0.4
Energy efficiency	21,796	235	92.7
Clean transportation	651	730	0.9
Waste management	583	155	3.8
Water management	n/a	3,442	n/a
Climate change adaptation	n/a	16	n/a
Total	662,390	25,750	n/a
Disbursed amounts with CO₂ impact		22,293	
Impact, tonnes CO₂e per SEK mn			29.7
Annual renewable energy generation, GWh		3,032,220 MWh p.a.	
Annual energy reduced/avoided, MWh		144,706 MWh p.a.	

¹) This table presents the calculated impact in terms of CO₂ reduced or avoided. Aggregated project data reported represent both ex-ante estimates and ex-post outcomes. Reporting methodology presented on pages 38–46. The complete project-by-project-reporting is available in spreadsheet format at kommuninvest.se ==> For investors ==> Green Bonds ==> Impact Reporting.

Impact attributable to green bond investors¹

78%

Whereof impact attributable to Green Bond USD 600 mn maturing 23 April, 2019	19%
Whereof Impact attributable to Green Bond SEK 5 bn, maturing 5 May, 2020	19%
Whereof Impact attributable to Green Bond USD 500m, maturing 1 June, 2021	17%
Whereof Impact attributable to Green Bond SEK 3 bn, maturing 15 December, 2021	12%
Whereof Impact attributable to Green Bond SEK 3 bn, maturing 1 June, 2023	12%

¹) Total outstanding green bonds divided by total outstanding disbursed amounts to projects (in SEK).

Basic information

Green Bond Frameworks applied	Report comprises projects financed under GB frameworks dated March 2018, January 2016 and May 2015
Related Green Bond ISIN(s)	XS1383831648 (RegS) / US50046PAU93 (144A); XS1508534861; XS1618289802 (RegS) / US50049GAB86 (144A); XS1897258098; XS1814404577
External verifier of allocation report	KPMG
Reporting period	Reporting for calendar year 2018. Comprises all eligible projects financed from GB programme start in 2015 until year-end 2018.
Report publication date	April 4, 2019
Frequency of reporting	Annual
Next reporting planned for	March/April 2020
Reporting approach	Portfolio-based and project-by-project reporting

KEY FACTS

- The Green Project portfolio exclusively consists of Green Loans to Swedish municipalities and regions. Each loan is selected according to the Kommuninvest Green Bonds Framework (see pages 14–16). The complete framework is available online.
- Kommuninvest reports on a portfolio basis in Swedish kronor (SEK). F/X rate as per the date of Green Bonds issuance.
- Kommuninvest reports impact based on the share of the project's total investment cost financed with green bonds. Impacts are based on outstanding disbursed amounts to projects (net of redemptions).
- Reporting is undertaken in accordance with recommendations outlined in the *Nordic Public Sector Issuers: Position Paper on Green Bonds Impact Reporting*.

Available at kommuninvest.se → Green Bonds → Impact Reporting

Appendix D

Summary of recommendations

Project category	Project examples (non-exhaustive)	Document reference	Indicators	Unit	Mandatory	Baseline / benchmark	General principles for all categories	
Renewable energy GBP category for reference: Renewable energy	<ul style="list-style-type: none"> Wind power generation Solar power plants Geothermal energy Bio-energy 	#27	<ul style="list-style-type: none"> Capacity of energy generation of plant Annual renewable energy generation Annual GHG emissions reduced/avoided 	<ul style="list-style-type: none"> MW MWh or GWh Tonnes CO₂e 	<ul style="list-style-type: none"> Y Y Y 	Emission factor for electricity; European mainland mix including Norway, 315 g CO ₂ e per kWh (or detailed approach), see appendix B. Emission factor for district heating; Swedish issuers may apply 158 g CO ₂ e per kWh, see Appendix B.	<p>7. Report based on the share financed</p> <p>8. Report impact by \$ only when quantifiable and relevant</p> <p>9. Report bond-by-bond or on bond-programme basis</p> <p>10. Incorporate climate-related physical risks when possible</p> <p>11. Report contributions to the Sustainable Development Goals (SDGs)</p> <p>12. Scope 1 and 2 are mandatory to report and Scope 3 is voluntary</p>	
Energy efficiency GBP category for reference: Energy efficiency	<ul style="list-style-type: none"> Retrofitting of existing buildings or installations Smart technology aimed at reducing energy consumption 	#29	<ul style="list-style-type: none"> Annual energy reduced/avoided (electricity and other energy savings) Reduction in energy use Annual GHG emissions reduced/avoided 	<ul style="list-style-type: none"> MWh or GWh Percentage Tonnes CO₂e 	<ul style="list-style-type: none"> Y Y Y 			
Green buildings GBP category for reference: Green Buildings	New or retrofitted buildings satisfying the issuer's energy and /or building standard requirements	#28	<ul style="list-style-type: none"> Energy avoided below national building standards Annual energy avoided compared to the relevant building code (for new buildings) Annual energy reduced compared to the pre-investment situation (for refurbishments) Annual energy production on-site Annual GHG emissions reduced/avoided 	<ul style="list-style-type: none"> kWh/m², or percentage (%) MWh or GWh MWh or GWh MWh or GWh Tonnes CO₂e 	<ul style="list-style-type: none"> Y Y Y 	<ul style="list-style-type: none"> National building codes or standards National building codes or standards 		
Clean transportation GBP category for reference: Clean transportation	<ul style="list-style-type: none"> Non-fossil public transportation systems Infrastructure for bicycles and pedestrians Infrastructure for electric vehicles 	#30	<ul style="list-style-type: none"> Annual GHG emissions reduced/avoided, from cars and other vehicles, due to the investment Number of km of new train lines, bicycle lanes etc. created Passenger-kilometres in new means of transportation Estimated reduction in car use and car kilometres the project will replace Project's effect on increased resilience to climate change 	<ul style="list-style-type: none"> Tonnes CO₂e Km Km Km 	<ul style="list-style-type: none"> Y 	<ul style="list-style-type: none"> Average emissions by km for alternative transportation. N/A 		
Waste management GBP category for reference: Pollution prevention and control	<ul style="list-style-type: none"> Energy efficient and resource-preserving waste treatment Biogas production from organic waste 	#31	<ul style="list-style-type: none"> Reduced/avoided GHG emissions as a result of the investment (See also Appendix B) Amount or share of waste that is prevented, minimised, reused or recycled before and after the project Amount of waste that is separated and/or collected and treated (including composted) or disposed of Number of tonnes processed in the facility Material recovery rate Expected improvement in material recovery rate or other target for improved resource use Number of households delivering to the facility Energy produced (in case of biogas/waste-to-energy plant) Energy saving attributable to the investment Project's effect on increased resilience to climate change 	<ul style="list-style-type: none"> Tonnes CO₂e Tonnes, Percentage (of total waste) Tonnes, Percentage (of total waste) Metric tonnes Percent Percent Number of households kWh/MWh/GWh kWh/MWh/GWh Tonnes CO₂e 	<ul style="list-style-type: none"> 	N/A		
Water and wastewater management GBP category for reference: Pollution prevention and control	<ul style="list-style-type: none"> Energy-/ emission efficient water and wastewater management Biogas production from wastewater 	#32	<ul style="list-style-type: none"> Annual water savings Annual volume of wastewater treated or avoided Capacity of plants being built Number of metres of piping/conduit laid, upgraded, replaced Number of person equivalents (PE) of water or wastewater the plant processes, identifying any increase that can be attributed to the investment Reduction of emissions into the local environment (nitrogen and phosphorous, Biochemical Oxygen Demand, etc) Amount of electricity, biogas or other energy carrier produced annually expected to be produced each year, if relevant. Include avoided CO₂ emissions Health metrics (such as air and water quality) Biological metrics: biological diversity, wildlife Project's effect on increased resilience to climate change 	<ul style="list-style-type: none"> m³ m³ m³ or litres/m³ per minute/hour/day or year Metres Number of people or PE Kilos/tonnes or litres/m³ kWh or MWh, tonnes CO₂e 	<ul style="list-style-type: none"> 	N/A		
Sustainable land use / environmental management GBP categories for reference: Terrestrial and aquatic biodiversity conservation; Environmentally sustainable management of living natural resources and land use	<ul style="list-style-type: none"> Biodiversity conservation Reforestation Restoration of wetlands 	#33	<ul style="list-style-type: none"> A number of qualitative and quantitative indicators may be relevant, see section #31 Number of species Number of individuals in target population Area reforested or converted Area of habitat or wetland restored 	<ul style="list-style-type: none"> Number Number m² or hectares m² or hectares 	<ul style="list-style-type: none"> 	N/A		
Climate change adaptation GBP category for reference: Climate change adaptation	<ul style="list-style-type: none"> Climate change adaptation measures such as: Heat protection Storm protection Systems for enhanced resilience Water management systems (to prevent or mitigate flooding) 	#34	<ul style="list-style-type: none"> A number of qualitative and quantitative indicators may be relevant, see section #32 Areas protected (such as building fasades) or number of heat shields etc Areas protected (building fasades or land such as school yards, hospital facilities, city centres) Capacity of system or area covered 	<ul style="list-style-type: none"> m² or number of items m² or number of items m³ or drainage areas covered in km² or hectares 	<ul style="list-style-type: none"> 	N/A		
								<p>1. Report expected impact, aiming for actual impact</p> <p>2. Report based on annual impact</p> <p>3. Provide annual reporting</p> <p>4. Provide quantitative and qualitative reporting</p> <p>5. Focus on environmental impact</p> <p>6. Report project-by-project, where feasible</p>

The *Nordic Position Paper on Green Bonds Impact Reporting* is a practical guide on impact reporting. It primarily targets persons engaged in impact reporting in Nordic public sector issuer organizations, but may be beneficial to other issuers and the Green Bond market as a whole. Crédit Agricole CIB, the Nordic Investment Bank and SEB have acted as advisors to the group of signatories.



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