Nordic Public Sector Issuers:

Position Paper on Green Bonds Impact Reporting

October

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Content

Acknowledgements

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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.

The document primarily targets persons engaged in impact reporting in issuer organisations, such as environmental officers, sustainability analysts and investor relations specialists. We also hope 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 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[1]. We advise issuers to consult the Green Bond Principles, which capture the spirit of green bonds issuance and reporting.[2]

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.

We advise readers that this position paper is a reflection of work in progress, and that 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.

[1] Transforming our world: the 2030 Agenda for Sustainable Development, http://www.un.org/sustainabledevelopment/sustainable-development-goals/

[2] The Green Bond Principles are available at www.icmagroup.org

Summary

Summary

The key impact reporting principles regarding financial, environmental and procedural aspects are:

Key financial aspects

Reporting 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).

Reporting impact in relation to invested monetary unit

- Report CO_2-reduction and other impact per invested monetary unit solely for investments made in projects or project categories where such impact is quantifiable and relevant.

Key environmental aspects

Reporting environmental impact

- Issuers shall report on direct environmental impacts such as renewable energy production, energy savings, reduced emissions (prioritizing a reduction of CO_2-equivalents), increased resilience, environmental operations and infrastructure etc.
- Issuers may choose to add social and/or economic impacts when deemed feasible and relevant.
- Reporting should also include indirect effects, such as avoided emissions, distinguishing them from reduced emissions.
- Issuers shall commit to report on expected impact (ex ante), and strive to report on actual impact (ex post).
- Reporting should target net benefits.
- Issuers shall highlight methodologies used and the potential uncertainty of environmental data to readers.

CO_2-baseline for electricity

- European mainland mix including Norway is recommended as the default baseline emission factor for electricity.
- Factor calculated as Combined Margin according to IFI Harmonized Framework[3] methodology, 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: 380 g CO_2/kWh. This baseline is to be updated annually, subject to availability of data.

[3] International Financial Institution Framework for a Harmonised Approach to Greenhouse Gas Accounting, November 2015

Baseline CO_2-emission calculation for district heating

- Issuers shall choose a baseline that is relevant and that reflects the national/local situation.
- Swedish issuers may draw on the Kommuninvest methodology (see Appendix E).

Use national building standards as baseline for measuring impact of green buildings

- Disclose the energy savings from green buildings as a net value in relation to national building requirements. Alternatively, report performance in comparison to a reference building.
- 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.

Key procedural aspects

Annual reporting

- Annual reporting recommended for dynamic portfolios.
- Disclose reporting period and process for project inclusion.
- For non-dynamic portfolios, issuers are also encouraged to report annually, but may elect a simplified approach (for instance, a confirmation of status quo).

Background

In August, 2016, a group of Nordic public sector issuers of green bonds[4] convened in Stockholm, Sweden, to discuss the feasibility of establishing a joint common approach to green bonds impact reporting, on the basis of work initiated by a group of international financial institutions and as documented in the IFI Harmonized Framework for Impact Reporting (IFI Harmonized Framework)[5]. During the development of this position paper the Nordic Investment Bank and two investment banks[6] have acted as advisors to the group. After the development work two additional issuers have joined the group of signatories.[7]

We, the signatory issuers, believe that a common Nordic position to the issues discussed may be beneficial to other public sector issuers as well as the investor community. We are confindent that by sharing experiences and know-how we can all benefit as individual issuers.

The group has met and teleconferenced on several occasions during 2016 and 2017. We have also conducted work in between meetings in smaller working groups, focusing on general and technical impact reporting issues.

Caveats

The objective of green bonds impact reporting is to provide transparent insight into the environmental performance of projects financed through green bonds. 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 the environmental benefits associated with investment projects financed through green bond proceeds, notwithstanding the potential social co-benefits that such projects may bring. This reflects our view regarding the need for a harmonisation of market practices for green reporting, however, as this paper outlines, issuers may choose to add social impacts in their reporting if feasible and relevant.

Contacts

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: ir@kommuninvest.se

[4] Participants (DK=Denmark, FI=Finland, NO=Norway, SE=Sweden): City of Göteborg (SE), Kommunalbanken (NO), Kommuninvest (SE), Municipality Finance (FI), Municipality of Norrköping (SE), Municipality of Örebro (SE), Stockholm County Council, SLL (SE), Swedish Export Credit Corporation, SEK (SE). Kommunekredit (DK) has participated in the group as an observer, 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.

[5] International Financial Institutions (IFIs): Green Bonds, Working Towards a Harmonized Framework for Impact Reporting, December 2015

[6] Crédit Agricole CIB and SEB.

[7] Municipality of Lund (SE) and Region Skåne (SE).

Nordic environmental commitments

The Nordic countries have undertaken ambitious climate action for several decades. Having decarbonised parts of their energy systems, the Nordic countries have decoupled CO_2 emissions from GDP growth since many years. The energy grids of two Nordic countries, Norway and Sweden, are among the least CO_2 intensive in the world.

Increasing integration between Northern European energy markets in combination with a forecasted increased supply of renewable energy production in the Nordic countries, means that energy saved or additional capacity created in the Nordic countries, translate into the crowding out of more CO_2-intensive energy production elsewhere (see Appendix B).

In addition, the Nordic countries often serve as test-beds for new technology and services. A study[8] commissioned by the Nordic Council of Ministers and published in connection with COP22 in Marrakech, showed that scaling up 15 existing and proven-to-work Nordic low-carbon solutions could cut global emissions by 4.1 gigatonnes ($GtCO_2e$) by 2030, equivalent to the total current emissions of the European Union.

Based on broad political and popular support for reducing greenhouse gas emissions, the Nordic countries have set ambitious environmental targets from a UNFCCC producer perspective[9]:

- Denmark has pledged to reduce greenhouse gas emissions by 40 percent by 2020, compared with 1990 levels. Furthermore, Denmark aims to convert the energy and transportation sector to run on 100 percent renewable energy by 2050.
- Finland is committed to reduce greenhouse gas emissions by at least 80 percent by 2050, compared to 1990 levels.
- Norway has pledged to reduce emissions by 40 percent by 2030, through a combination of accelerated emissions cuts and carbon offsetting.
- By 2030, Sweden aims to have reduced its emissions by 63 percent compared with 1990. As a long-term climate goal, Sweden will have no net emissions of greenhouse gases into the atmosphere by 2045.

[8] Nordic Green to Scale, Nordic climate solutions can help other countries cut emissions, (PDF: ISBN 978-92-893-4735-8) www.greentoscale.net

[9] UNFCC = United Nations Framework Convention on Climate Change. Production-based emissions take place within national territory and offshore areas over which the country has jurisdiction. Consumption-based emissions encompass emissions from domestic final consumption and the production of imports.

Scope

Scope

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[10].

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. Expected impact, with actual impact as an ambition

- Report on 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 CO_2 emissions.
- Target net benefits
- Highlight methodologies used and the uncertainty of environmental data to readers

We will base our impact reporting on the expected environmental impact (ex-ante) from the projects we finance or co-finance[11]. 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 whether impacts are based on ex-ante or 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. Report on emissions reductions if calculations can be made with satisfactory quality. If the reductions are too indirect they should not be included. The more indirect the reductions are the more explanation is needed. A conservative approach is recommended.

When relevant, reporting should distinguish between reduced and avoided CO_2 emissions. The former is a direct or absolute reduction in operation and the latter refers to a baseline/alternative reference scenario. This approach complements the IFI Harmonized Framework, which makes no such distinction.
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 CO_2 reduction, may be a future development.

Issuers are recommended to include information in their impact reports about the uncertainty of environmental data, attributable both to the scientific uncertainty regarding the measurement methods as well as uncertainties regarding the data that the measurement methods are applied to.

[10] Green Bond Principles 2017, Voluntary Process Guidelines for Issuing Green Bonds, 2 June 2017. Available at www.icmagroup.org

[11] 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. 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.

Reporting should preferably be normalized, ie. for a representative year.

3. Annual reporting
- Annual reporting recommended for both dynamic and non-dynamic portfolios
- Disclose reporting period and process for project inclusion
- For non-dynamic portfolios, issuers may elect more simplified approach

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 but issuers may 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. 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.

A summary of suggested core indicators can be found in Appendix A; these encompass both renewable energy, green buildings and energy efficiency as well as other project categories.

In their selection of quantitative reporting metrics, issuers may also wish to consult the IFI Harmonized Framework (for renewable energy and energy efficiency) and impact reporting recommendations by the Green Bond Principles[12].

[12] See Resource Centre for Green Bond Principles at www.icmagroup.org

5. Focus on environmental impact and multiple project categories
This position paper deals with reporting environmental impact related to green bond issuance. We, the signatories, 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.

We have also attempted to include recommendations regarding a range of project categories, including renewable energy, green buildings, energy efficiency, clean transportation, waste management and water and wastewater management.

6. Both project-by-project and portfolio basis
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 which do not exceed certain thresholds, project-by-project reporting is not required.

7. Reporting 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).

The impact report should account for the expected environmental impact made possible as a result of eligible projects to which green bond proceeds have been allocated and disbursed.

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 investments 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 not only emissions reductions in reporting, 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, but will also free up capacity to finance new projects with potential for incremental impact to the portfolio.

8. Reporting impact in relation to invested monetary unit

- Report CO_2-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 impact of an investment in relation to the invested monetary unit, i.e. X kg of CO_2 annually avoided 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 CO_2. This could, for instance, be adaptation and water management projects or sustainable buildings that have other significant environmental values apart from the CO_2 avoided/reduced. For certain projects, the major efficiency-enhancing investments may already have been made, thus increasing the marginal cost for additional improvements.

Issuers are therefore recommended to report CO_2-impact per invested monetary unit solely for the share of investments made 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 CO_2-impact is measurable, the issuer may communicate impact 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. Reporting in relation to project lifetime and bond tenor

We undertake to report on impact for the lifetime of the green bond(s) we have issued. 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.

Environmental impact:

Reporting benefits and comparing with relevant baselines

Environmental impact:

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.

10. Core indicators and energy units
Issuers should strive to calculate and aggregate project benefits for projects and project categories where this is feasible. A number of suggested indicators are listed in Appendix A below. Appendix A also highlights the Nordic issuers' approach to energy units used in impact reporting.

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

This paper outlines common approaches that are recommended for certain project categories and for electricity. Issuers may choose to also disclose alternative relevant baselines for information.

Issuers who report impact from projects located globally in different locations, may also elect to use different baselines in the calculation of environmental impact, if relevant and as long as they are transparent about their approach and methodology.

Whenever feasible and relevant we base our approach on the IFI Harmonized Framework[13], including their established methodology for Greenhouse Gas Accounting[14] (IFI Harmonized Approach).

12. Calculating greenhouse gas 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.

13. Project boundary and scope of emissions
The project boundary for greenhouse gas (GHG) 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 emissions. Scope 3 is most likely a necessary and desirable future development and should be considered once more widely accepted Life Cycle Analysis-methodology is in place (see Appendix C).

[13] International Financial Institutions (IFIs): Green Bonds, Working Towards a Harmonized Framework for Impact Reporting, December 2015

[14] International Financial Institution Framework for a Harmonised Approach to Greenhouse Gas Accounting, November 2015

14. CO_2-baseline for electricity

- European mainland mix including Norway is recommended as the default baseline emission factor for electricity
- Factor calculated as Combined Margin according to IFI Harmonized Framework methodology, 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: 380 g CO_2/kWh

A baseline emission factor for Nordic green bond issuers could be chosen from several, geographically different, grid factors: project specific, local, national, Nordic or European. Emission factors may also take into account certificates of origin and residual mix (current and future; medium or margin).

We are basing our approach for a CO_2-baseline for electricity on the IFI Harmonized Framework. According to this methodology, electricity is evaluated using CO_2 grid factors. Available figures are generally Scope 2.

The baseline emission factor is constructed using a Combined Margin (CM) for the grid that is comprised of an existing Operating Margin (OM) and a future Build Margin (BM).[15] The OM represents the marginal generating capacity in the existing dispatch hierarchy that will most likely be displaced by the project. The BM are the prospective power plants whose construction and operation would be affected by the project, based on an assessment of planned and expected new generation capacity. When adding new generation capacity to a grid it is likely to partly replace existing generation capacity on the margin (OM). In addition, it is also likely that in the absence of the project implementation, other generation projects would be implemented to meet the demand for power (BM).

Based on the IFI Interim Dataset of Harmonized Grid Factors v 1.0, as provided by Nordic Investment Bank, we have calculated an EU Mainland grid factor including Norway, which we use as the default baseline for accounting and disclosure of electricity.

Mainland Europe including Norway is chosen as the relevant baseline since interconnection and export surplus of electricity exist already from the Nordic countries and is planned to increase in the coming years and decades, which is the relevant perspective for most investments (see Appendix B for reference to a report published by the Nordic Council of Ministers and the International Energy Agency[16]).

Starting from the reporting year 2016, we apply the following baseline emission factor for electricity:
Combined Margin: 380 g CO_2/kWh

[15] International Financial Institution Framework for a Harmonised Approach to Greenhouse Gas Accounting, November 2015

[16] "Nordic Energy Technology Perspectives 2016 – Cities, flexibility and pathways to carbon-neutrality", Nordic Energy Research/Nordic Council of Ministers & International Energy Agency

We recommend using the same Combined Margin factor for both added renewable energy (RE), variable and firm, as well as energy efficiency/saved energy (EE) and electrification projects that lead to an increased use of electricity, for example in transport. With this approach we partly deviate from the IFI Harmonized Framework, in order to better reflect the Nordic context. It also means a more conservative approach. The rationale is our view that the IFI assumption, of variable renewable energy production replacing more fossil energy production than firm renewable energy production, is inappropriate for the Nordic context. We also use the same factor for electrification projects as for increased energy production, in order to simplify reporting requirements. A comparison between the Nordic issuers' approach and the IFI approach is available in Appendix D.

This baseline emission factor is to be updated on an annual basis (subject to availability of data), reflecting new grid factors and other relevant changes in conditions and assumptions. Issuers may choose another baseline, for example from a relevant local or national context, or use additional baselines (such as local, Nordic and European) for information.

15. Use of certificates of origin not recommended

Issuers are recommended not to use certificates of origin as the basis for CO_2-values. The principal reason is that we do not view them as a main driving force for development of renewable energy, in comparison with more substantial market setting policy measures such as the EU emissions trading system (EU-ETS), CO_2-taxation and the Swedish-Norwegian Green electricity certificates.

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

With the EU emissions trading system in place, it could be argued that all investments covered by the system only contribute to achieving the overall target and that additional reduction from one investment can lead to increased emissions from other projects and in other member states. However, the total quotas and mechanisms of the EU-ETS is a political issue influenced by the actual performance of emissions reductions. We have therefore not made any distinctions between investments and emissions that are inside or outside the EU-ETS.

Project category specifics

Below are the project categories that typically dominate Nordic public sector green bonds frameworks. However, individual frameworks may have its unique set of characteristics:

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

17. Renewable energy

Issuers are encouraged to report impact on renewable energy investments (wind, solar, hydro, wave, etc) according to the guidelines established by the IFIs[17], however using the same Combined Margin for electricity for all types of projects (see section 14: "CO_2-baseline for electricity" above).

18. Baseline CO_2-emission calculation for district heating

- No baseline emission factor for district heating has been established
- Swedish issuers may draw on the Kommuninvest methodology (see Appendix E)
- Chosen baseline should be relevant and reflect national/local situation.

In the Nordic countries, district heating[18] has successfully enabled the transition from fossil fuel based heating systems to heating systems based primarily on renewable energy sources, residual heat and waste. For example, the expansion of district heating and its conversion from fossil fuels to biomass and waste resources is the main factor behind Sweden's reduction in CO_2 emissions over the past decades. Remaining fossil fuel use is today being gradually substituted and phased out.

The systems of district heating and district cooling are fundamentally local/regional and not interconnected on a national or Nordic basis. However, the fuel used (bio, solid waste, fossil) is often traded over long distances. Local mixes for both direct and avoided emissions is considered relevant for most impact reporting perspectives, with the choice of using a national mix to simplify reporting. One such example, from Sweden (Kommuninvest), is presented in Appendix E.

There is not yet any IFI harmonised approach for investments related to district heating. Alternatives may include using "no project" as a baseline when financing district heating systems to new development areas (urbanisation), and "the actual situation before project implementation" for expansion projects to existing consumers.

Whatever baseline the issuer chooses, it should be relevant and reflect national/local circumstances and regulation. The calculation method should consider both caused direct emissions of district heating, cooling, steam and CHP electricity (including Scope 2) as well as baselines for avoided emissions from alternative sources of energy for these purposes.

[17] IFI Approach to GHG Accounting for Renewable Energy Projects, November 2015

[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.

19. Energy efficiency projects

We encourage issuers to apply the IFI Harmonized Framework approach for GHG-accounting for energy efficiency projects.[19] 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 as 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 % reduction in energy use for the same output/service. Regarding use of baselines for savings in electricity and in district heating, see above sections #14 and #17.

Reporting impact for whole or parts of the project

An energy efficiency project may be part of a larger retrofitting or refurbishing project, where parts of the project cost is not directly related to reductions in energy use. For example, the refurbishing of a building can involve both energy efficiency components such as improved insulation and ventilation systems, as well as purely esthetical components such as a façade upgrade. The impact (energy reduced) should be reported in relation to the entire project cost.

20. Use national building standards as baseline for measuring impact of green buildings

- Disclose the energy savings from green buildings as a net value in relation to national building requirements. Alternatively, performance can be reported in comparison to a reference building.
- 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

This position paper stipulates how issuers should report impact from green buildings, in relation to a baseline scenario. The precise eligibility criteria are stipulated in each issuer's green bond framework.

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 buildings comply with applicable national regulation, as defined in each Nordic country[20]. 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 sections #14 and #17.

As additional voluntary information, issuers may choose to report performance in comparison to reference buildings 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 information 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 buildings 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. and energy production of 5 kWh per sq.m.) Reporting issuers are in that case encouraged to separately report the energy produced on-site, preferably in the green buildings project category (since related costs often are not distinguished from the total investment in the building), and as a total on portfolio level.

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.

[19] IFI Approach to GHG Accounting for Energy Efficiency Projects, November 2015

[20] Building standards for the Nordic countries are generally considered ambitious. Maximum legally approved energy use has recently been subject to tightening, to match European Union requirements for near-zero energy buildings.

21. 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 CO_2 and other pollutants, in comparison with an alternative scenario.

We recognize that many smaller projects may not be backed up by pre-studies and surveys and therefore such reporting cannot always be required from issuers. Issuers are encouraged to investigate whether the same cost/benefit assumptions can be applied in the impact reporting as in the project's "business case" evaluation.

Whenever possible, avoided CO_2 emissions and other avoided pollutants should be reported upon.
A non-conclusive list of possible indicators for clean transportation project to report upon is set out below.

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

22. 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 those indicators which are relevant and feasible, including but not limited to:

- Estimate of the reduction in greenhouse gas emissions avoided as a result of the investment (See also Appendix E for the Kommuninvest methodology on district heating and waste treatment).
- Number of metric tons processed in the facility
- 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

23. Water & wastewater management
A number of quantitative and qualitative indicators may be relevant for impact reporting on water & wastewater management projects. Issuers are encouraged to select and report on those indicators which are relevant and feasible, 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 consult[21].

- 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 CO_2 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

24. 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 seek to identify both qualitative and quantitative measures, where qualitative measures may be of particular relevance. These may include surface area of the land converted (measured in square meters or square kilometers), biological diversity and air quality. If annual energy savings and/or reduction in greenhouse gas emissions or other emissions are relevant for the projects, issuers are encouraged to report on such measures also.

25. Adaptation measures
The objective of projects in this category is to improve local communities' resilience in the face of a changing climate. Adaptation measures are necessary prerequisites as local communities in the Nordic region are exposed to more volatile climate conditions, with for instance increased precipitation. 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.

[21] See Resource Centre for Green Bond Principles at www.icmagroup.org: "The GBP Impact Reporting Working Group – Suggested Impact Reporting Metrics for Sustainable Water and Wastewater Management Projects, June 2017"

Appendix A

Core indicators

Green buildings & Energy efficiency

- Annual energy savings in MWh or GWh (electricity) and MWh or GWh (other energy savings)
- Annual GHG emissions reduced/avoided, in tonnes of CO_2-equivalent

Renewable energy

- Capacity of energy generation of plant (MW)
- Annual GHG emissions reduced/avoided, in tonnes of CO_2-equivalent
- Annual renewable energy generation in MWh or GWh

Clean transportation

- A number of green indicators may be relevant, see section #21
- Net avoided emissions from cars and other vehicles due to the investment, in tonnes of CO_2-equivalent

Waste management

- A number of qualitative and quantitative indicators may be relevant, see section #22

Water & Wastewater management

- A number of qualitative and quantitative indicators may be relevant, see section #23

Sustainable land use/ environmental management

- A number of qualitative and quantitative indicators may be relevant, see section #24

Adaptation measures

- A number of qualitative and quantitative indicators may be relevant, see section #25

Energy units

The IFI Harmonized Framework recommends reporting in Joule energy units for energy efficiency savings and renewable energy generation. However, the most commonly used energy unit in the Nordic countries is watt-hours; 1 Wh is the equivalent to one watt of power expended for one hour of time.

We intend to use Wh as the energy unit in our impact reporting (i.e. kWh, MWh, GWh etc. along with installed effects in W, kW, MW etc.). However, it is recommended that a Joule (J) conversion factor is included, where 1 Wh represents 3.6 kJ, 1kWh represents 3.6 MJ and 1 MWh represents 3.6 GJ, etc. Issuers may also choose to report aggregate energy savings or added capacity in Joules, alongside Wh.

Appendix B

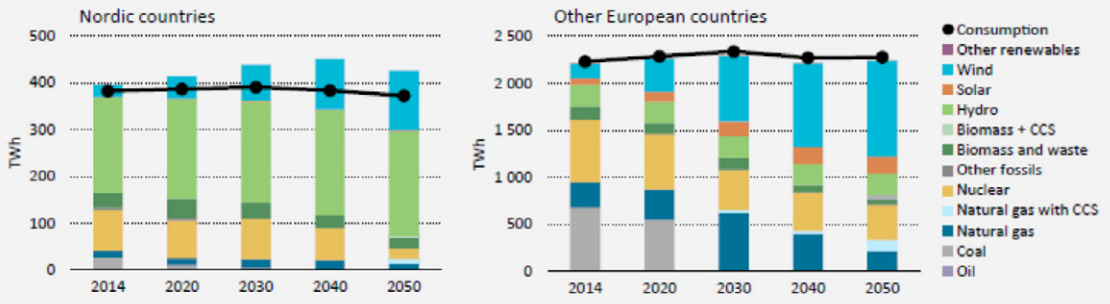
Report: Nordic Energy Technology Perspectives 2016

Generally speaking, a local or national mix for electricity does not exist today 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.

According to a report published in 2016 by the Nordic Council of Ministers and the International Energy Agency (IEA)[22], the Nordic electricity system had net exports of almost 15 TWh in 2015. Some of the report findings regarding expected supply and demand as well as trade patterns are outlined in graphs below:

- Energy production in the Nordic countries is expected to increase, while demand for energy is expected to decrease.
- Anticipated electricity demand from continental Europe could significantly expand the market for low-carbon electricity generated in the Nordic countries, allowing the Nordic region as a whole to become a major net exporter of clean energy. Seizing this opportunity depends on: a) build-out of wind capacity and necessary flexibility to handle variability; b) reducing Nordic demand through energy efficiency; and c) setting up the necessary inter-connectors and domestic grid strengthening to enable trade.

Figure 3.12 Development of power generation in the overall system, CNS-B



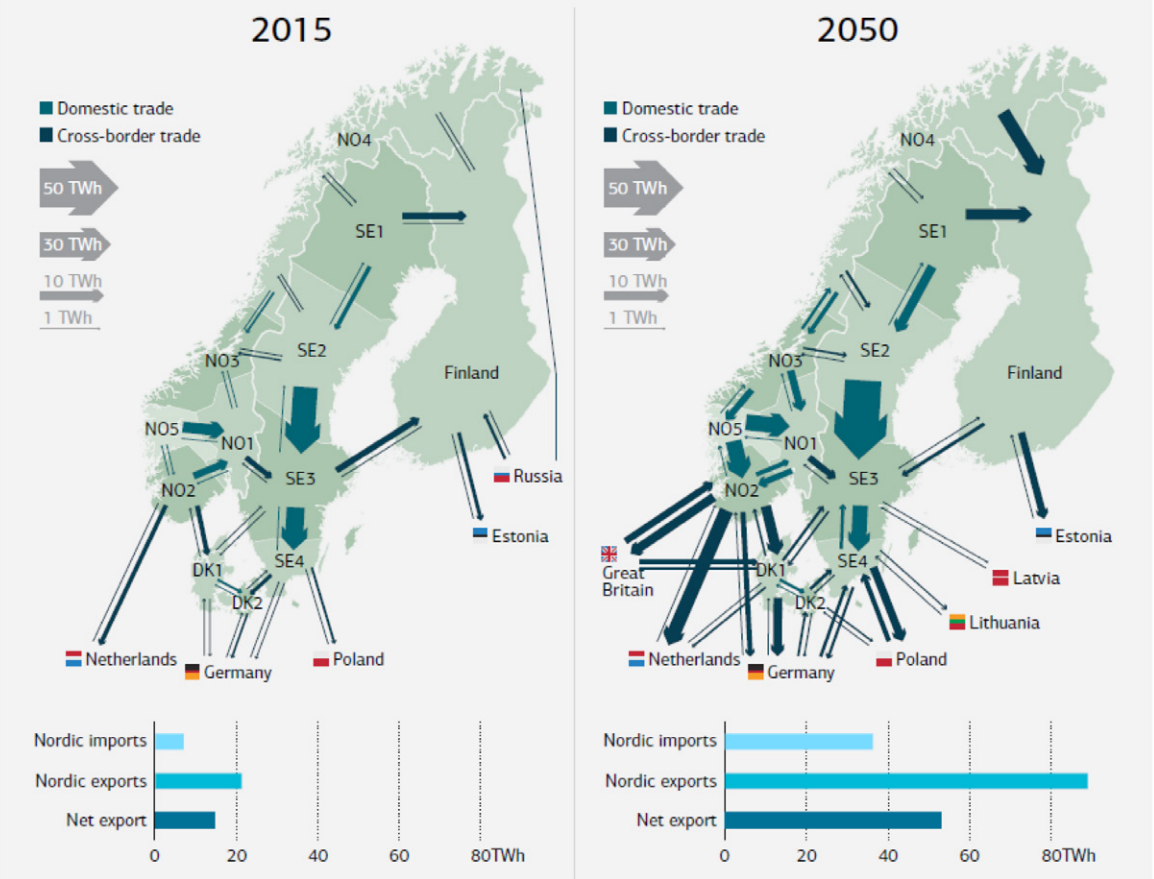
Figures and data in this report can be downloaded at www.iea.org/etp/nordic.

Key point *By 2050 about 30% of electricity generation is based on VRE and more than 50% on hydropower in the Nordic countries. In the other European countries, almost 60% of electricity is generated from VRE.*

Note: CNS = Nordic Carbon-Neutral Scenario;
Source: Nordic Energy Technology Perspectives (NETP) 2016

[22] "Nordic Energy Technology Perspectives 2016 – Cities, flexibility and pathways to carbon-neutrality", Nordic Energy Research/Nordic Council of Ministers & International Energy Agency

Figure ES.5 Nordic electricity trade in 2015 (left) and 2050 in the CNS (right)



Notes: Trade with Russia is assumed to fall to zero in 2050. Iceland is not included in the figure as it is not yet connected with any other electricity system and the potential for Icelandic interconnectors was not modelled. This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries, and to the name of any territory, city or area.
Figures and data in this report can be downloaded at www.iea.org/etp/nordic.

Key point *Anticipation that electricity prices in Europe will be higher than in the Nordic region in the CNS creates an attractive trade opportunity; expansion of variable renewables and interconnector capacity could lead to net Nordic exports of over 50 TWh in 2050.*

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

Appendix C

Project boundary and scope of emissions

The project boundary for greenhouse gas (GHG) accounting should include all activities, facilities or infrastructure that the issuer is financing. Issuers may voluntarily choose to add a consumer/life cycle analysis perspective.

The Greenhouse Gas Protocol, a widely used accounting tool for greenhouse gas emissions, differentiates between direct and indirect emissions: Direct GHG emissions are emissions from sources that are owned or controlled by the reporting entity. Indirect GHG emissions are emissions that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another entity. The GHG Protocol categorizes these direct and indirect emissions into three broad scopes:

i) Scope 1: All direct GHG emissions.
ii) Scope 2: Indirect GHG emissions from consumption of purchased electricity, heat, cooling or steam.
iii) Scope 3: Other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g. transmission & distribution losses) not covered in Scope 2, outsourced activities, waste disposal, etc.

The signatories to the IFI Harmonized Approach recommends GHG accounting to include Scope 1 and Scope 2 emissions, and Scope 3 on a voluntary basis. At this stage, the Nordic issuers commit to report on Scope 1 and Scope 2 emissions. Scope 3 is most likely a necessary and desirable future development and should be considered once more widely accepted Life Cycle Analysis-methodology is in place. Issuers should report on which Scope is used for the impact report.

Appendix D

Baseline emission factors for the electricity grid

IFI HARMONIZED FRAMEWORK APPROACH / NORDIC ISSUERS' APPROACH

Type	IFI Approach[23]	Nordic issuers' approach
Firm generation (e.g. hydropower, geothermal and biomass)	Combined Margin = 50% Operating Margin + 50% Build Margin	Combined Margin = 50% Operating Margin + 50% Build Margin
Variable generation (wind and solar)	Combined Margin = 75% Operating Margin + 25% Build Margin	Combined Margin = 50% Operating Margin + 50% Build Margin
Electricity consumption from the grid, e.g. green buildings and energy efficiency projects	Combined Margin = 50% Operating Margin + 50% Build Margin	Combined Margin = 50% Operating Margin + 50% Build Margin
Electrification projects	N/A	Combined Margin = 50% Operating Margin + 50% Build Margin

COMBINED MARGIN APPLIED BY THE NORDIC ISSUERS

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

Combined Margin: 380 g CO_2/kWh

→ = 50% Operating Margin (483 g CO_2e/kWh) + 50% Build Margin (277 g CO_2e/kWh)[24]

This baseline emission factor is to be updated on an annual basis (subject to availability of data), reflecting new grid factors and other relevant changes in conditions and assumptions.

[23] See International Financial Institution Framework for a Harmonised Approach to Greenhouse Gas Accounting, November 2015

[24] Calculation by Kommuninvest in March 2017, based on IFI Interim Dataset of Harmonized Grid Factors v 1.0, as provided by Nordic Investment Bank

Appendix E

Kommuninvest's method for Swedish district heating projects

In 2017, Kommuninvest commissioned Profu[25], an envirotech consultancy, to develop a calculation method for the net CO_2-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 CO_2/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. This corresponds to 41 g CO_2/kWh as a national average for solid waste in district heating, based on a baseline emission factor of 170 g CO_2e/kWh for waste. The total baseline emission factor applied for the majority of Kommuninvest's district heating projects is therefore 158 g CO_2e/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 2015 was 58 g CO_2/kWh (scope 2, including 6 % fossil fuels, 2 % peat and 23 % solid waste).

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.

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

Appendix F

A visualized summary of the Nordic issuers' position on impact reporting for green bonds

Project category	Project examples (non-exhaustive)	Reference in document	Indicators	Unit	"Must have"	Baseline / benchmark	General principles for all categories
Renewable energy	• Wind power generation	#17				Emission factor for electricity: European mainland mix including Norway, 380g CO_2 per kWh (or detailed approach). Emission factor for district heating: Swedish issuers may apply 158 g CO_2 per kWh (see Appendix E).	6. Both project-by-project and portfolio basis 7. Reporting the share financed 8. Reporting impact in relation to invested monetary unit 9. Reporting in relation to project lifetime and bond tenor 10. Scope 1/2/3: incl. Scope 1+2 (mandatory) and Scope 3 (voluntary) 1. Expected impact, with actual impact as an ambition 2. Annual impact 3. Annual reporting 4. Quantitative and qualitative reporting 5. Focus on environmental impact and multiple project categories
	• Solar power plants		Annual renewable energy generation	kWh	Y		
	• Geothermal energy		Capacity of renewable energy plant	MW	Y		
GBP category for reference: Renewable energy	• Bio-energy		Annual GHG emissions reduced/ avoided	CO_2e reduced/avoided	Y		
Energy efficiency	• Retrofitting of existing buildings or installations	#19	Annual energy savings	kWh/MWh/GWh	Y		
	• Smart technology aimed at reducing energy consumption		Reduction in energy demand	percentage			
GBP category for reference: Energy efficiency							
Green Buildings	• New or retrofitted buildings satisfying the issuer's energy and/ or building standard requirements		Annual energy avoided, compared to national building requirements	kWh/MWh	Y	National building codes	
		#20	Annual GHG emissions reduced/ avoided	CO_2e reduced/avoided	Y		
GBP category for reference: Green Buildings			Other environmental impacts and benefits				
Clean transportation	• Non-fossil public transportation systems	#21	Net avoided emissions from cars and other vehicles due to the investment (by comparison to average emission by km for car transportation)	CO2 equivalents		N/A	
	• Infrastructure for bicycles and pedestriants		Number of km of new train lines, bicycle lanes etc. created	km of new train lines, bicycle lanes etc. created			
	• Infrastructure for electric vehicles		Number of people in new means of transportation	number of people			
			Estimated reduction in car use and car kilometers the project will replace	number of km driven			
GBP category for reference: Clean transportation			Project's effect on increased resilience to climate change				
Waste management	• Energy efficient and resource-preserving waste treatment	#22	Number of tons processed in the facility	metric ton		N/A	
	• Biogas production from organic waste		Expected imiprovement in material recovery rate or other target for improved resource use	10 percent			
			Number of households delivering to the facility	number of households			
			Energy produced (in case of biogas/ waste-to-energy plant)	kWh/MWh/GWh			
GBP category for reference: Pollution prevention and control			Energy saving attributable to the investment	kWh/MWh/GWh			
			Estimated reduction in CO_2 emissions	CO_2 equivalents			
Water & wastewater management	• Energy-/ emission efficient water and wastewater management	#23	Capacity of plant	litres/m3		N/A	
	• Biogas production from wastewater		Number of meters of piping/conduit laid, upgraded, replaced	meter			
			Number of person equivalents of water or wastewater the plant processes	number of persons (p.e.)			
			Annual water savings	litres/m3			
			Annual volume of wastewater treated or avoided	litres/m3			
			Amount of electricity/biogas/energy carrier produced annually	kWh			
GBP category for reference: Pollution prevention and control			Relevant metrics for health impact, biodiversity impact, reductions in local emissions				
Sustainable land use/environmental management	• Biodiversity conservation	#24	A number of qualitative and quantitative indicators may be relevant, see section #24			N/A	
GBP categories for reference: Terrestrial and aquatic biodiversity conservation; Environmentally sustainable management of living natural resources and land use	• Reforestation						
Adaptation measures	• Climate change adaptation measures	#25	A number of qualitative and quantitative indicators may be relevant, see section #25			N/A	
GBP category for reference: Climate change adaptation							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