

‘Second Opinion’ on Handelsbanken’s Green Bond Framework

June 13, 2018

Summary

Handelsbanken's Green Bond Framework (GBF) together with its climate and environmental policies provide a strong base for climate-friendly investments. CICERO is encouraged to see that Handelsbanken takes climate risk, including physical risks, seriously and is currently working systematically to raise awareness and better understanding internally of the banks' exposure to such risks.

Handelsbanken has in place a very strong governance structure in its green bond framework. The Green Finance Committee (GFC) reviews information about the assets and evaluates the overall environmental benefit. CICERO sees it as clear strength that life-cycle considerations, potential rebound effects, scientific targets and resilience considerations have been included as screening criteria in a standardized evaluation process of green assets. The issuer also points to several project category specific criteria that assets will be scrutinized against, e.g. exclusion of waterpipes linked to fossil fuel energy production. The issuer applies a conservative approach to screening assets. If there is doubt of the environmental benefits or compliance with the Green Bond Framework, assets will not be included. Eligible Green Assets are approved by majority vote by the GFC, where the Bank's Chief Sustainability Officer holds a veto.

The framework also includes ambitious reporting. CICERO has some concerns that not all green bond projects will be listed and that only aggregate amounts allocated to the various Eligible Green Asset Categories will be made public. These concerns are, however, partially accommodated by the strength of the framework: Handelsbanken will encourage clients to allow the issuer to make the information publicly available, and will engage an independent third party to investigate its annual Green Bond Report and make its findings available on a dedicated website.

Based on the overall assessment of the project types that will be financed by the green bonds and governance and transparency considerations, Handelsbanken's Green Bond Framework receives a Dark Green shading. With that said medium green projects that represent a substantial part of the portfolio, will be approved under the framework such as, green building and waste to energy projects. Due to the broad nature of the framework, Handelsbanken should take extra care when selecting eligible projects to ensure rigorous environmental assessment that supports the dark green ambitions of the framework.



°CICERO
Dark Green

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1 Introduction and background

As an independent, not-for-profit, research institute, CICERO Center for International Climate Research provides Second Opinions on institutions' framework and guidance for assessing and selecting eligible projects for green bond investments and assesses the framework's robustness in meeting the institutions' environmental objectives. The Second Opinion is based on documentation of rules and frameworks provided by the institutions themselves (the client) and information gathered during meetings, teleconferences and e-mail correspondence with the client.

CICERO has established the global Expert Network on Second Opinions (ENSO), a network of independent non-profit research institutions on climate change and other environmental issues, to broaden the technical expertise and regional experience for Second Opinions. CICERO works confidentially with other members in the network to enhance the links to climate and environmental science, building upon the CICERO model for Second Opinions. In addition to CICERO, ENSO members currently include Basque Center for Climate Change (BC3), International Institute for Sustainable Development (IISD), Stockholm Environment Institute (SEI), and Tsinghua University's Institute of Energy, Environment and Economy. A more detailed description of CICERO can be found at the end of this report. ENSO encourages the client to make this Second Opinion publicly available. If any part of the Second Opinion is quoted, the full report must be made available.

CICERO's Second Opinions are normally restricted to an evaluation of the mechanisms or framework for selecting eligible projects at a general level. ENSO network members do not validate or certify the climate effects of single projects, and thus, has no conflict of interest in regard to single projects. Network members are neither responsible for how the framework or mechanisms are implemented and followed up by the institutions, nor the outcome of investments in eligible projects. CICERO is independent of the entity issuing the bond, its directors, senior management and advisers, and is remunerated in a way that prevents any conflicts of interests arising as a result of the fee structure.

This note provides a Second Opinion of Handelsbanken's Green Bond Framework and policies for considering the environmental impacts of their projects. The aim is to assess the Handelsbanken Green Bond Framework as to its ability to support their stated objective of climate mitigation.

This Second Opinion is based on the green bond framework presented to CICERO by the issuer. Any amendments or updates to the framework require that CICERO undertake a new assessment.

CICERO takes a long-term view on activities that support a low-carbon climate resilient society. In some cases, activities or technologies that reduce near-term emissions result in net emissions or prolonged use of high-emitting infrastructure in the long run. CICERO strives to avoid locking-in of emissions through careful infrastructure investments and moving towards low- or zero-emitting infrastructure in the long run. Proceeds from green bonds may be used for financing, including refinancing, new or existing green projects as defined under the mechanisms or framework. CICERO assesses in this Second Opinion the likeliness that the issuer's categories of projects will meet expectations for a low carbon and climate resilient future.

Expressing concerns with ‘shades of green’

CICERO Second Opinions are graded dark green, medium green or light green, reflecting the climate and environmental ambitions of the bonds and the robustness of the governance structure of the Green Bond Framework. The grading is based on a broad qualitative assessment of each project type, according to what extent it contributes to building a low-carbon and climate resilient society. The shading methodology also aims at providing transparency to investors when comparing green bond frameworks exposure to climate risks. A dark green project is less exposed to climate risks than a lighter green investment.

This Second Opinion will allocate a ‘shade of green’ to the green bond framework of Handelsbanken:

- **Dark green** for projects and solutions that are realizations today of the long-term vision of a low carbon and climate resilient future. Typically, this will entail zero emission solutions and governance structures that integrate environmental concerns into all activities.
- **Medium green** for projects and solutions that represent steps towards the long-term vision but are not quite there yet.
- **Light green** for projects and solutions that are environmentally friendly but do not by themselves represent or is part of the long-term vision (e.g. energy efficiency in fossil-based processes).
- **Brown** for projects that are irrelevant or in opposition to the long-term vision of a low carbon and climate resilient future.

The project types that will be financed by the green bond primarily define the overall grading. However, governance and transparency considerations are also important because they give an indication whether the institution that issues the green bond will be able to fulfil the climate and environmental ambitions of the investment framework. Investments in all shades of green projects are necessary in order to successfully implement the ambition of the Paris agreement. The overall shading reflects an ambition of having the majority of the project types well represented in the future portfolio, unless otherwise expressed by the issuer.

2 Brief Description of Handelsbanken's Green Bond Framework and rules and procedures for climate-related activities

Handelsbanken is one of the major publicly traded Swedish banks that provides personal and corporate banking, financing, mortgage loans, investment banking, and private banking. Headquartered in Stockholm in Sweden, Handelsbanken has expanded its banking operations across the other Nordic countries, and has more than 800 branches across its home markets in Sweden, Norway, Denmark, Finland, the UK and the Netherlands.

Handelsbanken has a presence in other countries with the primary purpose of serving home market customers in these other countries. The bank has signed several international agreements relevant to its proposed Green Bond Framework, such as the UN Global Compact, the UN Principles for Responsible Investment (PRI) and the UN Environment Programme Finance Initiative. According to the bank, Agenda 2030 and the Sustainable Development Goals are integrated into the Bank's operations. The Bank issues an annual sustainability report in accordance with the Global Reporting Initiative's (GRI) guidelines.

According to the issuer, sustainability is a vital part of the Bank's credit policy. As a lender, Handelsbanken assesses and evaluates customers' approach to the principles and agreements supported by the Bank. Ultimately, this can result in Handelsbanken declining to grant credit to companies that do not apply these principles. Special caution is exercised when it comes to companies that are involved in unconventional or particularly high-risk extraction of fossil fuels. According to the issuer there have been a few cases lately where the Bank has taken the decision to end its engagement with, or reduce commitments to, fossil fuel companies, including companies involved in tar sands. Handelsbanken does not directly finance new mining of coal for combustion or new coal power plants. In 2017, the Bank launched Green Loans to its corporate clients in Sweden, primarily to finance environmentally certified buildings.

Use of proceeds:

Handelsbanken's Green Bonds can be used to finance new loans and to refinance existing loans in accordance with the Green Bond Framework. The ambition is, however, to allocate the majority of the net proceeds to new loans. Only loans and investments in Handelsbanken's home markets, i.e. Sweden, Norway, Finland, Denmark, the UK and the Netherlands could qualify for green bond proceeds.

Fossil energy generation, nuclear energy generation, research and/or development within weapons and defense, potentially environmentally negative resource extraction (such as rare-earth elements or fossil fuels), gambling, alcohol, adult entertainment or tobacco are all excluded from green bond financing under the framework. The issuer has clarified that no projects within the mining sector are eligible under this Green Bond Framework.

Selection:

The selection process is a key governance factor in the Green bond Principles. We typically look at how climate and environmental considerations are taken into account when evaluating whether projects can qualify for green bond funding. The broader the project categories, the more importance CICERO places on the governance process. All clients and loans in the Handelsbanken Group are managed and approved in the regular credit process. The local branches nominate new and existing loans within the eligible green use of proceeds categories

to the Green Finance Committee (“GFC”) for review and potential approval. Handelsbanken has informed us that the Bank is continuously strengthening the organizational understanding of the increased importance of environmental aspects. As part of this, all employees including those in the local branches go through mandatory annual sustainability training.

Handelsbanken’s Green Financing Committee is a sub-committee of the Group Sustainability Committee, from which it also draws many of its members. Handelsbanken’s Chief Sustainability Officer chairs the Group Committee, the Green Finance Committee and is responsible for sustainability strategy and implementation throughout the Bank.

The decisions by the GFC are well documented. The information gathered in the approval process will, according to the framework, be recorded in a database. This database (the “Green Registry”) allows for monitoring of the Green Assets and will be used to determine if there is headroom to issue a Green Bond.

Management of proceeds:

The proposed management approach for Green Bond proceeds are in alignment with the Green Bond Principles. They are transparent and clearly separate green bond proceeds. An amount equal to the net proceeds of any issue under the Green Bond Framework will be credited to an earmarked portfolio (the “Green Portfolio”) managed by the Bank’s Treasury. If an Eligible Green Asset no longer qualifies according to the Green Terms or if the underlying eligible loan is repaid or divested, an amount equal to the funds will be re-credited to the Green Portfolio pending reallocation to other Eligible Green Assets. The unlikely event whereby there are no Eligible Green Assets, the proceeds may be invested or utilized by Treasury in accordance with the Bank’s internal sustainability policy and the requirements of the liquidity reserve. The allocation of the green bond proceeds will be verified by an external auditor.

Transparency and Accountability:

Transparency, reporting, and verification of impacts are key to enable investors to follow the implementation of green bond programs. Procedures for reporting and disclosure of green bond investments are also vital to build confidence that green bonds are contributing towards a sustainable and climate-friendly future, both among investors and in society. Handelsbanken will publish a yearly report, including on impacts, on its website on the allocation of green bond proceeds.

The green bond impact reporting will contain a disclosure of asset level performance indicators, and the bank will attempt to allocate impact based on Handelsbanken’s financing’s share of the total investment. For assets and projects that are not yet operational, the issuer will strive to provide estimates of future performance levels. Handelsbanken will emphasize energy production/savings and greenhouse gas savings as the most relevant performance metrics for most project types. However, the issuer will when and where available, also report on category specific metrics such as freight or passenger capacity for green transportation projects and quantity of treated wastewater and/or supplied freshwater for sustainable water and wastewater management projects.

The table below lists the documents that formed the basis for this Second Opinion:

Document Number	Document Name	Description
1	Handelsbanken's Green Bond Framework 13.06.2018	This document comprises Handelsbanken's Green Bonds Framework and how the company intends to use proceeds, how it plans to evaluate and select eligible projects, manages the proceeds and reports to investors.
2	Sustainability Report 2017	
3	Policy for Ethical Standards	Group wide guiding principles ensuring that high ethical standards are followed.
4	Policy Against Corruption	Group wide guiding principles aiming at preventing corruption
5	Policy for Management of Conflicts of Interest	Group wide guiding principles on how to deal with conflict of Interest in business operations.
6	Guidelines for Environmental Activities	Group wide principles on environment including sustainability and CDP reporting. Also listing relevant international initiatives
7	Outsourcing Agreements Relating to Operations of Material Significance	Principles making it clear that the group is still responsible if important operations are outsourced.
8	Guidelines Regarding Human Rights and Working Conditions	Handelsbanken works to prevent or restrict any negative impact on human rights (including children's rights) and employees' rights.

9	Guidelines Regarding Business Relations with The Armaments and Defence Industry	Present the issuer's view of business relations with companies that operate within the armaments and defence industry.
10	Guidelines Regarding Business Relations with Companies with Operations within Fossil Fuels	The issuer seeks to minimise its negative impact through lending, investment in companies whose operations consist of extraction of, or energy production based on, fossil fuels, which are not actively working to ensure a changeover to renewable energy sources.
11	Guidelines Regarding Business Relations in Forestry and Farming	Through its operations, Handelsbanken wishes to encourage sustainable forestry and farming.
12	Sustainability Overview – Corporate Lending	A sector initiative developed in the Swedish Bankers' Association in order to give an insight into how banks take sustainability into account in their lending to corporates.
13	Guidelines for Managing Taxes	
14	Climate Change – Handelsbanken's Guidelines	The issuer's policy on climate change with references to the Paris agreement and other international initiatives
15	Supplier code of Conduct	Based on the ten principles of the Global Compact, Handelsbanken expects its suppliers to act in accordance with human and labour rights, the environment and anti-corruption.
16	Annual Report 2017	Information about the company's activities and financial performance

17	Policy for Sustainability	Handelsbanken aims to integrate financial, environmental and social responsibilities into all its operations
18	Policy on Measures against Money Laundering and Financing of Terrorism and the Observance of International Sanctions	
19	Guidelines for the Sustainability Committee	Short guideline on the role of the Sustainability Committee
20	Flowchart Green Bonds	Flowchart describing the identification of green bonds projects.
21	Instructions for the Green Finance Committee	Describing the role and voting rules of the Committee.
22	Green Loan for Buildings at Handelsbanken and Stadshypotek	Eligibility criteria for green loans
23	Green financing for solar energy	Criteria for green financing for solar energy
24	Instructions for the approval of Green Finance Committee customers	
25	Green Loan Application Example	
26	Decision documentation for the assessment of existing loans with the Green Finance Committee	Template for decision document for green finance projects.
27	Standard letter to receive approval from lender to make project information publicly available	

28 Green Register Example

29 Categories and criteria:
Supplementary information More detailed criteria for the project
categories in the green bond
framework.

Table 1 Documents reviewed

3 Assessment of Handelsbanken’s Green Bond framework and environmental policies

Overall, Handelsbanken’s green bond framework provides a detailed and sound framework for climate-friendly investments.

The framework and procedures for Handelsbanken’s green bond investments are assessed and their strengths and weaknesses are discussed in this section. The strengths of an investment framework with respect to environmental impact are areas where it clearly supports low-carbon and resilience projects, whereas the weaknesses are typically areas that are unclear or too general. Pitfalls are also raised in this section to note areas where issuers should be aware of potential macro-level impacts of investment projects.

Overall shading

Based on the project category shadings detailed below, and consideration of the issuer’s systematic sustainability work and strong governance structure of Handelsbanken green bond framework in terms of management and use of proceeds, we rate the framework CICERO Dark Green. With that said, also medium green projects that represent a substantial part of the portfolio will be approved under the framework. This is in particular the case for green buildings and waste to energy projects. Due to the broad nature of the framework, Handelsbanken should take extra care when selecting eligible projects to ensure rigorous environmental assessment that supports the dark green ambitions of the framework.

Eligible projects under the Green Bond Framework

At the basic level, the selection of eligible project categories is the primary mechanism to ensure that projects deliver environmental benefits. Through selection of project categories with clear environmental benefits, green bonds aim to provide certainty to investors that their investments deliver environmental returns as well as financial returns. The Green Bonds Principles (GBP) state that the “overall environmental profile” of a project should be assessed and that the selection process should be “well defined”.

Category	Eligible project types	Green Shading and some concerns
Clean transportation	<ul style="list-style-type: none"> Public Transport; Financing of electric vehicles for public transport, such as busses, trains, subway cars or trams, including retrofits and modernization. Low Carbon Vehicles; Financing of electric freight and passenger vehicles such as plug-in hybrids, 	<p>Dark to Medium Green</p> <p>✓ Assessing sustainability in the transport sector is not straightforward. The largest amount of carbon savings come from switching from inefficient modes of transport (e.g. private cars) to mass transit. However, where projects are</p>

	<p>fully electric cars or fully electric trucks, as well as directly associated investments such as charging stations.</p>	<p>aimed at like-for-like replacement of transport infrastructure, the improvements in environmental performance depend on the fuel type and efficiency.</p> <ul style="list-style-type: none"> ✓ Transport projects that includes fossil fuel elements such as hybrid vehicles get a medium green shading because we see these as bridging technologies, and not a long term solution ✓ According to the issuer, the majority of projects funded under this category will be electric public transport
<p>Environmentally Sustainable Management of Living Natural Resources</p>	<ul style="list-style-type: none"> • Professional clients, such as corporations or municipalities, or any client who's forest holding exceeds 1500 hectares, are required to have an up to date and valid sustainable forestry certification from either FSC or PEFC. • Non-professional clients, such as individuals or small corporations, are eligible if the forest holding is between 50 and 1500 hectares, located in Sweden and compliant with the Swedish Forestry Act. The forest holdings must also have an up to date green forest management plan, including conservation action plans for at least five per cent of the productive area (nature protection and habitat management) and a minimum of five per cent deciduous trees. 	<p>Dark to Medium Green</p> <ul style="list-style-type: none"> ✓ All Sustainable Forestry assets are assessed and validated by experts at Handelsbanken Skog & Lantbruk, the banks Forest and Agriculture financing subsidiary, before inclusion in the Green Registry. ✓ Extraction of peat is not eligible, nor is the drainage of peatland or fossil fuel machinery. However, it is possible that fossil fuel driven machinery will be used when and where the forest is logged. ✓ The ambition is to calculate annual net absorption of CO2 of financed forest in accordance with best practice, applying a precautionary approach.
<p>Green buildings</p>	<ul style="list-style-type: none"> • Development, acquisition, renovation or otherwise completed residential, public and commercial properties that have or will receive (i) a design stage certification, (ii) a post-construction certification or (iii) an in-use certification in any of the following building 	<p>Medium Green</p> <ul style="list-style-type: none"> ✓ Building criteria are good, but not the best. In a 2050 perspective, the energy performance of buildings is expected to be improved, with zero emission houses becoming mainstream and the energy performance of existing buildings

	<p>certification schemes at the defined threshold level or better:</p> <ul style="list-style-type: none"> a) Miljöbyggnad “silver b) BREEAM-SE “very good” c) BREEAM in-use “Very Good” d) LEED “gold” e) Svanen <ul style="list-style-type: none"> • The building must also have at least 15% lower energy use than required by the applicable national building code. 	<p>greatly improved through refurbishments.</p> <ul style="list-style-type: none"> ✓ According to the issuer, the green building portfolio will also include buildings with the highest level of certification available and significantly lower energy use than the framework criteria.
Pollution Prevention and Control	<ul style="list-style-type: none"> • Waste to Energy; Financing of waste to energy investments that do not use fossil energy, such as peat, coal, oil or gas. • Waste Management; Financing of waste management or waste treatment, such as collection, prevention, reduction or recycling of waste in a responsible and environmentally friendly way • Removal of harmful substances, including soil remediation; Financing of the removal and replacement of harmful substances, such as micro plastics, chemicals or metals. 	<p>Medium to Dark green</p> <ul style="list-style-type: none"> ✓ Waste management projects could include initiatives to enhance recycling rates, divert waste or improve the impact of waste operations. Incineration with energy recovery is a sound environmental and climate friendly option to divert waste away from landfills. ✓ Waste incineration is however best combined with ambitious recycling policies. When the capacity for waste incineration is high, it might be an incentive for prioritize incineration of waste for energy purposes over recycling. Hence, in order to achieve a dark green shading for such projects a high focus on recycling fossil fuel waste such as plastics, into new materials is needed. ✓ Be aware of emissions from transportation of waste.
Renewable energy	<ul style="list-style-type: none"> • such as solar, wind, water and geothermal, which produce clean and renewable energy, as well as any related infrastructure investments (such as grid connections and electric sub-stations). 	<p>Dark green</p> <ul style="list-style-type: none"> ✓ For new construction of hydro, only small hydro with a maximum capacity of 10 MW is eligible. Existing large-scale hydro is eligible only for the continued and unchanged operation of current power plants and only if they are located in the Nordics..

		✓ Only emissions free geo-thermal heat is eligible
Sustainable Water and Wastewater Management	<ul style="list-style-type: none"> • Financing of plants and related infrastructure for the supply of fresh water or processing of wastewater, such as ultrafilters, other upgrades, energy or other efficiency improvements, capacity expansions, enabling infrastructure, new network infrastructure, new-build or process investments in the water purification processes 	<p>Dark green</p> <p>✓ Water and wastewater management are key issue for climate adaptation, while there is a limited effect for mitigation. Be aware of potential negative local environmental impacts, impacts on biodiversity and lifecycle emissions. Be aware of possible lock-in of pipes and infrastructure supporting fossil fuel related industries. Careful consideration should be taken in assessing projects to exclude fossil fuel elements (e.g. water pipelines to coal power plants).</p>

Table 2. Eligible project categories

Strengths

CICERO is encouraged to see that Handelsbanken appears to take climate risk, including physical risks, seriously and is currently working systematically to raise awareness and better understanding of the banks' exposure to such risks. According to the issuer it has focused on understanding and mapping transition related risk in the bank's credit and investment portfolios, including alignment tests against a 2-degrees scenario in collaboration with the NGO 2-degrees Investing Initiative. Upcoming work in this area includes physical climate risk analysis of Handelsbanken's lending portfolio as part of the implementation of the Recommendations of the Task Force on Climate-related Financial Disclosure. This analysis will include the bank's own offices and branches. The first step will be to focus the analysis on the possible impact from increased risk of flooding and raised sea levels, followed by impacts related to changes in precipitation patterns and increased drought.

Handelsbanken's aim is that its direct impact on climate and the environment should be as low as possible. Since 2013, CO₂ emissions generated by own operations have been reduced by 42 per cent. The largest contributing factor has been increased use of green electricity (by purchasing certificates of origin), followed by increased energy efficiency. Reported emissions with location-based-approach (not including certificates) has decreased with 22 % during the same period.

Handelsbanken has a unique corporate culture that is heavily decentralized and the organizations tries to avoid top-down, centralized processes. For example, unlike many other companies, the bank does not have a centralized annual budget. Handelsbanken has explained that they have a very restrictive approach to fixed numerical targets in any area, including the environmental area. Instead, the organization has thorough measuring and follow-up of results. Handelsbanken's goal is to continuously lower emissions year on year, through continuous improvements and efforts, and this goal is subject to the same type of measuring and follow-up has financial goals.

Handelsbanken has in place an outstanding governance structure in its green bond framework. The Green Finance Committee reviews information about the assets and evaluates the overall environmental benefit. CICERO sees it as clear strength that life-cycle considerations, potential rebound effects, scientific targets and resilience considerations have been included as screening criteria in a standardized evaluation process of green assets. The issuer also points to several project category specific concerns that assets will be scrutinized against. The exclusion criteria of the framework prohibits any assets directly linked to fossil fuels to be eligible. The issuer has informed us that any projects related to water infrastructure located in fossil fuel intense energy systems will be carefully scrutinized, in particular in UK and the Netherlands as to make sure they do not support any fossil fuel based processes, such as coal power plants. CICERO encourages the issuer to not limit its scrutiny to these two countries. Also in the Nordics, water projects related to fossil fuels could occur.

It is further a strength that the issuer applies a conservative approach. If there is doubt of the environmental benefits or compliance with the Bank's Green Bond Framework, such assets will not be included. Eligible Green Assets are approved by majority vote by the GFC, where the Bank's Chief Sustainability Officer holds a veto.

The decisions by the GFC are well documented in the "Green Registry". The framework also includes ambitious reporting. CICERO has some concerns that not all green bond projects will be listed publicly and that only aggregate amounts allocated to the various Eligible Green Asset Categories will be made public. These concerns are, however, partially accommodated by the strength of the framework: Handelsbanken will encourage clients to allow the issuer to make the information publicly available, and will engage an independent third party to investigate its annual Green Bond Report and make its findings available on the dedicated website. The Reporting will contain a disclosure of asset level performance indicators. Handelsbanken emphasizes energy production/savings and greenhouse gas savings as the most relevant performance metrics for most project types. The reporting will strive to disclose the impact based on the Bank's financing's share of the total investment. For assets and projects that are not yet operational Handelsbanken will strive to provide estimates of future performance levels.

It is Handelsbanken's general view, in which CICERO agree, that electrified mass transport projects are key for the transition to a carbon free transportation system. Although the greenhouse gas emissions intensity of the grid affects the degree of positive impact, the build out and maintenance of an electrified mass transport system will result in lower emissions over its life cycle compared to other viable transport systems. Therefore, no considerations of local grid factors are made for projects related to the electrification of mass transport. For the electrification of individual transport such as electric cars or plug-in-hybrid cars however, grid factors are considered. It is a strength that only individual transport assets sold in jurisdictions with low greenhouse gas intensity are eligible.

The use of waste for energy purposes represents a potential pitfall when it comes to supporting a low carbon and climate resilient future. Waste incineration with energy recovery is a sound environmental and climate friendly option to divert waste away from landfilling. Waste incineration is best combined with ambitious recycling policies. When the capacity of waste incineration is high it might be an incentive to burn waste for energy purposes instead of material recycling. Hence, there is a particular need to continue to improve in this regard, in particular to recycle more fossil fuel waste such as plastics into new materials. Handelsbanken is aware of this risk and seems to factor this in the assessment of possible projects in this category.

Weaknesses

No significant weaknesses perceived.

Pitfalls

An investment category that includes technologies that are realizations today of the long-term vision of a low carbon and climate resilient future is considered dark green. Typically, this will entail zero emission solutions such as public transportation solutions like trains and trams. Handelsbanken's green bond proceeds allocated to electric cars or hydrogen cars would also be examples of such dark green solutions. Medium green covers technologies such as plugin hybrids that represent steps towards the long-term vision, but are not quite there yet since they partly still run on fossil fuels.

Uncertainty exists in carbon emission data from car manufacturers. The gap between official and real-world CO₂ emissions from new European passenger cars are growing. The International Council on Clean Transportation (ICCT) found a difference of 42% in 2015, which challenges the emission reductions indicated by the producers in recent years. There is work underway in order to improve the methodology used by car manufactures. An updated methodology is however not expected to include emissions from e.g. air condition and use of electric devices in the car. A gap between calculated emissions and the real world will therefore still exist. There are also uncertainties around how much the owners of the hybrid cars actually run their cars on non-fossil alternatives.

Technologies that are environmentally friendly but do not by themselves represent or are part of the long-term vision (e.g. energy efficient fossil fuel cars) are graded light green. Hybrids qualify as bridging technologies and hence a medium green shading is within reach. However, since battery capacity of most of these hybrids still is limited and because hybrids also could run on petrol alone, and since there will be no tracking of real emissions, these types of cars are in the borderline between light and medium green. Handelsbanken has informed us that they will exclude plug in hybrids with very low battery capacity (below 40 km battery range).

The total environmental impact of buildings over their life time is difficult to calculate with accuracy. Energy efficiency is key, but it is not sufficient to ensure low overall environmental impact and a good living environment. Impacts from the construction phase, the choice of material, water use, pollution and access to public transport are also important factors that determine a buildings overall sustainability. Therefore Handelsbanken has made both a strong certification, which takes into account many of these aspects, and energy efficiency mandatory for buildings to be eligible in this category. In a low carbon 2050 perspective, the energy performance of buildings is expected to be improved, with zero emission technology becoming mainstream and the energy performance of existing buildings greatly improved through refurbishments. The issuer is taking a step in this direction by including energy efficiency criteria, but it should be mindful of the need for continuous improvements in terms of raising the bar on this criteria

Sustainable forest management operations, such as thinning, logging, and transport, requires machinery. Investments in forest management may entail the use, contracting or purchase of machinery running on fossil fuels, creating climate gas emissions. The current practice is not in line with the low carbon society. Forest management may further require the construction of roads to give access to felling sites and are needed, a.o. for the transportation of logs. It is a strength that the framework explicitly rule out that green bond proceeds may be used to finance the above mentioned activities. and the drainage of wetlands. However, it is possible that fossil fuel driven machinery will be used when the forest is logged. The Bank anticipates that Green Loans will form an increasing share of eligible assets. The issuer has informed us that when criteria for the product Green Loan Forest, which is under development, is established the choice of fuels is something that could be considered.

For impact reporting related to electricity in the categories Renewable Energy, Green and Energy Efficient Buildings and Pollution Prevention and Control (Waste to Energy), Handelsbanken will use methods, assumptions and grid factors presented in the Position Paper on Green Bonds Impact Reporting (Nordic Public Sector Issuers, October 2017). For reporting related to reduced heat consumption, historic grid factors for district

heating will be used, also in line with the Position Paper. For other sectors, impact reporting will be in accordance with best practice, applying a precautionary approach.

CICERO very much welcomes the development and use of a common methodology in impact reporting, and sees it as a clear strength that Handelsbanken commits adherence to the "Nordic Public Sector Issuers: Position Paper on Green Bonds Impact Reporting" in their Green Bond Framework. CICERO is encouraged that not only emissions reductions, but also other indicators that measure the transition to a low carbon and climate resilient society are reported. Investors should however be aware of the different approaches commonly applied in calculating emissions from production and use of electricity. Estimating the actual marginal emission impact of electricity in the Nordic grid is an extremely complex task, and different analyses may produce results varying from nearly zero to almost 1000 gCO₂/ kWh, depending on assumptions and project-specific conditions.

The European grid factor recommended by the Nordic Public Sector Issuers is 380 g CO₂/kWh, and based on the methodology outlined in the Harmonized Framework for Impact Reporting developed by a group of multilateral development banks. Investors should be aware that this factor is higher than the European average grid factor, which was 350 g CO₂/kWh in 2015 (International Energy Agency). The Nordic Public Sector Issuers have chosen the geographic area comprising EU26+Norway because the Nordic energy system is more and more connected to other European countries facilitating export and import of electricity. production mix. Using such a mix would be more favourable for electrifications solutions such as electric vehicles. The average grid factor for production in the Nordic countries today according to the European Environmental Agency amounts to 83 g CO₂/kWh².

Impacts beyond the project boundary

Due to the complexity of how socio-economic activities impact the climate, a specific project is likely to have interactions with the broader community beyond the project borders. These interactions may or may not be climate-friendly, and thus need to be considered with regards to the net impact of climate-related investments.

Rebound effects

Efficiency improvements may lead to rebound effects. When the cost of an activity is reduced there will be incentives to do more of the same activity. From the project categories in Table 2, an example is energy efficiency investments in buildings which in part may lead to more energy use. Handelsbanken should be aware of such effects and possibly avoid Green Bond funding of projects where the risk of rebound effects is particularly high. However, the work that Handelsbanken does directly with its property users shows that Handelsbanken is aware and actively mitigating the risk of rebound effects related to energy efficiency.

Appendix: About CICERO

CICERO Center for International Climate Research is Norway's foremost institute for interdisciplinary climate research. We deliver new insight that helps solve the climate challenge and strengthen inter-national climate cooperation. We collaborate with top researchers from around the world and publish in recognized international journals, reports, books and periodicals. CICERO has garnered particular attention for its work on the effects of manmade emissions on the climate and the formulation of inter-national agreements and has played an active role in the UN's IPCC since 1995.

CICERO is internationally recognized as a leading provider of independent reviews of green bonds, since the market's inception in 2008. CICERO received a Green Bond Award from Climate Bonds Initiative for being the biggest second opinion provider in 2016 and from Environmental Finance for being the best external review provider (2017).

CICERO Second Opinions are graded dark green, medium green and light green to offer investors better insight in the environmental quality of green bonds. The shading, introduced in spring 2015, reflects the climate and environmental ambitions of the bonds in the light of the transition to a low-car-bon society.

CICERO works with both international and domestic issuers, drawing on the global expertise of the Expert Network on Second Opinions. Led by CICERO, ENSO is comprised of trusted research institutions and reputable experts on climate change and other environmental issues, including the Basque Center for Climate Change (BC3), the Stockholm Environment Institute, the Institute of Energy, Environment and Economy at Tsinghua University and the International Institute for Sustainable Development (IISD). ENSO operates independently from the financial sector and other stakeholders to preserve the unbiased nature and high quality of second opinions.

cicero.oslo.no/greenbonds

