

# **‘Second Opinion’ on Nacka Municipality’s Green Bond Framework**

---

May 23, 2018

# Summary

Overall, Nacka Municipality's Green Bond Framework (GBF) provides a progressive, clear and sound framework for investments in projects that align well with the Green Bond Principles.

The issuer and its subsidiary companies have ambitious climate-related goals, including per person reduction of GHG emissions of 30 percent by 2030. It has broader environmental ambitions as well, covering clean air, a non-toxic local environment, clean water, sustainable living and rich local natural habitats. Progress on each goal is tracked against a set of indicators and highlighted in the Municipality's Annual Report.

The green bond proceeds will go towards projects specifically selected to promote the transition to low carbon and sustainable development. Nacka Municipality has created a council for green bonds which will be responsible for selecting eligible projects. The council includes expertise on environmental issues and selection decisions will be made by consensus. There will be annual reporting on the green bond, including reporting on installed capacity of renewable energy and energy use from buildings. We encourage Nacka Municipality to consider reporting also on other indicators.

Green bond proceeds can be used to finance new projects or refinance existing ones. The majority of the proceeds are likely to go towards financing energy efficient commercial and residential buildings, and to a lesser extent infrastructure in support of the expansion of the Stockholm metro system

Based on the overall assessment of the project types that will be financed by the green bonds and governance and transparency considerations, Nacka Municipality's Green Bond Framework receives a Dark Green shading. Nacka Municipality has informed us that less than 50% of funds raised from green bonds will be allocated to projects in the category energy efficient commercial and residential buildings which has received a medium green shading.



°CICERO  
Dark Green

# Contents

---

<b>Summary</b>	<b>2</b>
<b>1 Introduction and background</b>	<b>4</b>
Expressing concerns with ‘shades of green’	5
<b>2 Brief Description of Nacka Municipality’s Green Bond Framework and rules and procedures for climate-related activities</b>	<b>6</b>
Policies	6
Definition:	7
Selection:	7
Management of proceeds:	8
Transparency and Accountability:	8
<b>3 Assessment of Nacka Municipality’s Green Bond framework and environmental policies</b>	<b>11</b>
Overall shading	11
Eligible projects under the Green Bond Framework	11
Strengths	14
Weaknesses	15
Pitfalls	15
<b>Appendix: About CICERO</b>	<b>16</b>

---

# 1 Introduction and background

As an independent, not-for-profit, research institute, CICERO (Center for International Climate and Environmental Research - Oslo) 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 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. 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. CICERO does not validate or certify the climate effects of single projects, and thus, has no conflict of interest in regard to single projects. CICERO is neither responsible for how the framework or mechanisms are implemented and followed up by the institutions, nor the outcome of investments in eligible projects.

This note provides a Second Opinion of Nacka Municipality's Green Bonds Framework and policies for considering the environmental impacts of their projects. The aim is to assess the Nacka Municipality's Green Bonds Framework as to its ability to support Nacka Municipality's stated objective of promoting the transition to low-carbon and climate resilient growth.

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 Nacka Municipality:

- **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 Nacka Municipality's Green Bond Framework and rules and procedures for climate-related activities

Nacka Municipality ("Nacka Municipality") is a Municipality in south-east Sweden with just over 100 000 inhabitants. The Municipality is situated just east of Stockholm and parts of it are considered to belong to the Stockholm metropolitan area. The Municipality is in a growth phase, driven by a growing population and its proximity to the capital (a population increase of 40 percent is expected between now and 2030). This growth is leading to expansion and new investment needs in housing and transportation.

The Municipality has a holding company - Nacka Stadshus AB – which is sole shareowner of Nacka Energi AB (energy company) and Nacka Vatten och Avfall AB (water and waste company).

Proceeds raised under this green bond framework can fund eligible projects within municipal units, municipal companies and their subsidiaries. The issuer has informed us that all organizations funded under the green bond framework will follow relevant municipal policies.

### Policies

The Municipality and its companies have ambitious climate related goals. Nacka Municipality's goal is to reduce GHG emissions per person by 30 percent by 2030, as compared to 2011 emissions, and by 15 percent by 2020. By 2016, they had managed a reduction of 13 percent. Goals are stated for emissions from the transport sector and construction. Energy use, road transport and household emissions (from transport, buildings and food) are the most significant contributors to Nacka Municipality's GHG emissions. Total emissions from the energy sector are currently decreasing while those from road transport are increasing.

The Municipality of Nacka Municipality currently has six explicitly stated environmental goals: Reduced impact on climate change, clean air, a non-toxic local environment, clean water, sustainable living and rich local natural habitats. Progress on each goal is tracked against a set of indicators and highlighted in the Municipality's Annual Report. Several indicators are available on-line as well. Certification schemes against which the goal for sustainable living are measured include Miljöbyggnad, Svanen, and BREEAM. Energy use in municipal buildings has been decreasing since 2009 and figures from 2017 shows that Nacka Municipality is on track to meeting its 2020 target. Nacka's annual recycling of plastic amounts to approximately 12.5 kg of plastic per person.

For transport, Nacka Municipality is tracking progress on the uptake of public transport as well as cycling. Nacka Municipality environmental strategy is published as a stand-alone document but is also given broad coverage in the Municipality's annual report. Some of the indicators used to track progress have been updated in 2017, which suggests that Nacka Municipality actively monitors and implements its policy. Nacka Municipality's strategy for the transport sector and built environment has sustainability and climate friendliness as stated aims. An external assessment of the state of Nacka Municipality's environmental strategy was undertaken in 2015, with quantitative tracking against indicators, which again suggests that Nacka Municipality takes a genuine interest in its environmental performance.

As of 2017, Nacka Municipality is monitoring the climate change impacts of the food purchases of Municipality – owned businesses.

Nacka Municipality's procurement policy with respect to labour rights and social and environmental aspects is regulated by a guidance document, the most recent version of which was published in January 2018 (*Inriktningen för krav ur miljömässiga, sociala och arbetsrättsliga aspekter vid upphandling*). The goal of the policy is to ensure that Nacka Municipality's procurements are ethically, environmentally and socially just and that they are in line with the Municipality's objectives in these areas. The policy is a guidance document rather than a standard, as the Municipality believes a flexible policy is more expedient than a set of standards. The Municipality does not apply ISO or EMAS standards to its projects. The Municipality has an ambition to apply life cycle perspectives on procurement decision, but it is not yet a policy.

External contractors are required to follow the municipal environmental policy. The requirements can vary from case to case, for example, if the project is in a sensitive environment the demands can be higher. Environmental audits are routinely performed by internal auditors.

#### **Definition:**

The green bond proceeds will go towards projects specifically selected to promote the transition to low carbon and sustainable development ("Green Projects"). Nacka Municipality has defined Green Projects as projects that aim to either:

- a) Reduce greenhouse gas emissions (including investments in low-carbon and clean technologies, such as energy efficiency and renewable energy)
- b) Adapt operations to climate change (including investments in increased resilience)
- c) Address other environmental issues (maximum 20 percent of proceeds will be invested in these projects)

Eligible projects can be funded in whole or in part by the Municipality of Nacka Municipality. Proceeds can be used to finance new projects or to refinance existing ones. Nacka Municipality's Green Bond framework explicitly excludes nuclear power and fossil fuel-based projects.

#### **Selection:**

Nacka Municipality has created a council for green bonds (the 'Green Bond Council'). The members of the Green Bond Council will come from the relevant entities of Nacka Municipality and will have expertise in environmental issues, finance, strategy and project management and construction.

Projects will be subject to the Municipality's procurement policy, which includes guidelines on ethical, environmental and social aspects. However, projects are currently not analyzed on a life cycle basis nor does the Municipality subject its projects to ISO or EMAS standards. According to the framework the issuer will analyze each project to ensure that environmental gains in one area do not adversely affect another prioritized area unnecessarily.

Project selection will be based on Nacka Municipality's Green Bond Framework and decisions will be reached by consensus. If there is disagreement about the eligibility of a project, the project will be excluded from the green bond pool.

In addition to the Green Bond Framework, eligible projects must comply with EU law, the Swedish Environmental Code (“Miljöbalken”) and align with the Municipality’s environmental goals, regulations, plans and programs.

### Management of proceeds:

Proceeds from the issuance of Green Bonds will be separated and tracked by the issuer. Net proceeds will be credited to a separate account. As long as Green Bonds are outstanding and the account has a positive balance, Nacka Municipality will, at the end of every fiscal triannual period, deduct funds from the account of an amount equal to disbursements through Green Projects made during such period.

Prior to disbursement to Green Projects, the separate account balance will be placed as part of the Municipality’s liquidity reserve. The liquidity reserve is governed by the Municipality’s funds management policy, which states that the funds should be placed in short term money market instruments with a high credit rating.

### Transparency and Accountability:

The issuer will annually report on the use of proceeds in an Investor Newsletter. The letter will include a list of financed Green Projects, including allocated amounts, a description of the projects and their main environmental benefits, a description of the allocation between financing of new projects and re-financing, and a summary of Nacka Municipality’s Green Bond development. The investor newsletter will be made publicly available on Nacka Municipality’s webpage.

Nacka Municipality’s Green Bond Framework includes a general principle of undertaking impact reporting ‘to the greatest extent possible’. The issuer has committed to including impacts for two eligible project categories in the Investor Letter:

- Energy efficient commercial and residential buildings: The expected or actual energy use for each building
- Renewable energy: the amount of installed or produced renewable energy will be reported (measured in MW/ MWh)

Other impact reporting will be included ‘to the extent possible’. The use of proceeds from the Green Bonds, as well as tracking and management of funds will be part of the annual control of Nacka Municipality. The use of all proceeds, including proceeds from the Green Bond, will be audited during the regular year-end external audit. The audit will also do an overall assessment of a selection of processes with significant value and risk.

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

Document Number	Document Name	Description
1	Nacka Municipality - Ramverk för Gröna Obligationer – March 6th 2018	The green bond framework (in Swedish)
2	Nacka Municipality – Årsredovisning 2017	Annual Report 2017



3	Nacka Miljöprogram 2016-2030 (updated 2018)	Nacka Municipality's Environmental Policy for the period 2016-20
5	Nackas översiktsplan	Nacka Municipality's Spatial Development Strategy (2017)
6	Revidering av översiktsplan	Document explaining the process of revision of the 2012 Strategy leading up to the Spatial Development Strategy (document 5)
7	Analys av miljösituationen i Nacka 2015	State of the Environment report
8	Lokala miljömål i Nacka - Uppföljning av indikatorerna	An update with new information on indicators from the State of the Environment Report (document 7)
9	Nacka Municipalitys klimatpåverkan	Report on Nacka Municipality's environmental impacts from 2015
10	Riktlinjer för hållbart byggande	Nacka Municipality Guidelines for sustainable buildings (from 2012)
11	Energianvändning i Municipalityens egna byggnader	On-line indicator showing energy use in Municipality-owned buildings
12	Dagvattenstrategi	Nacka Municipality's strategy and guidelines for handling of stormwater
13	Avfallsplan 2020	Nacka Municipality's plan for waste management, building on EU regulations and with aims for the period up to 2020
14	Klimatpåverkan från Municipalityens livsmedelsinköp	Assessment of climate change impacts from the Municipality's food consumption (purchases)

---

15	Framkomlighet i Nacka	Transport strategy for Nacka Municipality (2016)
16	Strategi för cykelsatsningar i Nacka	Strategy for enabling more bicycle use
17	Reglemente för medelsförvaltning	Policy for funds management (including liquidity reserves)

---

Table 1. Documents reviewed

### 3 Assessment of Nacka Municipality’s Green Bond framework and environmental policies

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

The framework and procedures for Nacka Municipality’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 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 governance structure of Nacka Municipality in terms of management and use of proceeds, we rate the framework CICERO Dark Green. The framework includes both medium and dark green projects categories.

#### 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
Renewable Energy	<ul style="list-style-type: none"> <li>• Wind power</li> <li>• Solar power</li> <li>• Bioenergy</li> <li>• Geothermal</li> <li>• Transmission</li> </ul>	<p><b>Dark Green</b></p> <ul style="list-style-type: none"> <li>✓ Nacka Municipality is the network owner and purchases electricity from two sources. The underlying energy mix is 90-100% renewable</li> <li>✓ Bioenergy investments: only small-scale projects which use local biomass (from Sweden) are eligible</li> <li>✓ Nacka Municipality is not planning any large scale geothermal investments. Any geothermal investments for green bond</li> </ul>

		financing would only small scale (ground source heat pumps for single building or small group of buildings).
Energy efficiency	<ul style="list-style-type: none"> <li>• District heating/cooling</li> <li>• Energy recovery</li> <li>• Energy storage</li> <li>• Smart grids</li> <li>• Other efficiency measures. Reduction of at least 25% required</li> </ul>	<p><b>Dark Green</b></p> <ul style="list-style-type: none"> <li>✓ Proceeds from the green bond will not finance district heating facilities themselves, only investments linking the buildings to the district heating network.</li> <li>✓ The underlying energy mix in the district heating network is between 89% and 100%, depending on the supplier</li> <li>✓ Nacka Municipality should be aware of possible lock-in of pipes and infrastructure supporting fossil fuel related infrastructure</li> </ul>
Sustainable transportation	<ul style="list-style-type: none"> <li>• Fossil free public transportation, pedestrian and bicycle paths</li> <li>• Vehicles driven by hydrogen, biogas and electricity</li> <li>• Logistics solutions leading to reduced climate footprints from transportation of people and goods</li> </ul>	<p><b>Dark to Medium Green</b></p> <ul style="list-style-type: none"> <li>✓ The Municipality will support the expansion of the Stockholm subway system, but does not own the subway system itself</li> <li>✓ The upgrading of the Municipality's vehicle fleet is allowed under this category. The upgrade will be to either plug-in hybrids or electric vehicles</li> <li>✓ Vehicles that include fossil fuel elements such as plug in hybrid vehicles get a medium green shading because we see these as bridging technologies, and not a long term solution</li> </ul>
Replacement of fossil raw materials	<ul style="list-style-type: none"> <li>• For instance, from fossil based plastics to bioplastics.</li> </ul>	<p><b>Dark Green</b></p> <ul style="list-style-type: none"> <li>✓ Nacka Municipality aims to replace all building materials containing hazardous substances (SVHC) when renovating properties</li> <li>✓ The Municipality funds pre-schools that aim to clean their yards from plastics and chemicals, for example artificial lawns and plastic toys.</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Replacing plastic granulates in artificial lawns on football grounds to more durable materials, for example to cork, sand et cetera is another measure</li> </ul>
Energy efficient commercial and residential buildings	<ul style="list-style-type: none"> <li>• Commercial and residential buildings that meet the requirements for Miljöbyggnad silver, BREEAM and BREEAM in use very good or Svanen and have an energy use per m<sup>2</sup> that is at least 25% lower than the requirements in current national regulations (Boverkets Byggregler, BBR)</li> <li>• Major renovations leading to a reduced energy use of at least 35 % per m<sup>2</sup> per year</li> </ul>	<p><b>Medium Green</b></p> <ul style="list-style-type: none"> <li>✓ For investments in energy efficiency it is important to consider the potential of rebound effects for energy consumption</li> <li>✓ A dark green shading would require zero emission or plus house technologies.</li> <li>✓ Construction projects can have potential negative local environmental impacts.</li> </ul>
Waste Management	<ul style="list-style-type: none"> <li>• Recycling and re-use, rehabilitation of contaminated land and leachate management</li> </ul>	<p><b>Dark Green</b></p> <ul style="list-style-type: none"> <li>✓ Initiatives will include recycling facilities, recycling masses property, clean-up of contaminated areas, and handling of chopped masses where the masses can be re-used</li> <li>✓ Projects of rehabilitation of contaminated land are also eligible</li> <li>✓ The green bond will not finance any incineration plants</li> </ul>
Water and waste water management	<ul style="list-style-type: none"> <li>• Treatment ponds to clean contaminated leachate</li> <li>• Expansion of the sewage network to enable more properties to be connected to the municipal sewage network.</li> </ul>	<p><b>Dark Green</b></p> <ul style="list-style-type: none"> <li>✓ Nacka should take care to consider negative impacts on wildlife, nature and lifecycle pollution and to avoid negative impacts on biodiversity.</li> </ul>
Climate adaptation measures	<ul style="list-style-type: none"> <li>• Water management measures in areas of elevated risk of flooding</li> <li>• Adaptation of roads, buildings, and pipelines to</li> </ul>	<p><b>Dark Green</b></p> <ul style="list-style-type: none"> <li>✓ Investments that prolong the life of road transport can be a concern from a long-term climate change perspective</li> </ul>

	<p>create higher resilience to climate-induced changes</p>	<ul style="list-style-type: none"> <li>✓ The pipelines that are eligible for investments are for wastewater only</li> <li>✓ Nacka Municipality does not have a specific strategy for avoiding lock-in of fossil fuel investments but it does have strategies to encourage citizens and employees to avoid the use of fossil fuel-based transportation, including a bicycle strategy</li> <li>✓ The strategy of the Municipality includes increased use of green infrastructure to reduce waste water overflows, improve temperature adjustments and biodiversity</li> </ul>
<p>Environmental measures (in fields other than climate mitigation and climate adaptation)</p> <p>(max. 20% of proceeds to be spent on this category)</p>	<ul style="list-style-type: none"> <li>• Nature conservation</li> <li>• Biodiversity</li> <li>• Development of non-toxic environments</li> <li>• Improved eco-system services</li> </ul>	<p><b>Dark Green</b></p> <ul style="list-style-type: none"> <li>✓ Positive sustainability-related project.</li> </ul>

Table 2. Eligible project categories

**Strengths**

Nacka Municipality’s Green Bond Framework is a robust framework for financing the Municipality’s continued transition to a low-carbon economy. The green bond proceeds will go towards projects selected to either reduce greenhouse gas emissions (including investments in low-carbon and clean technologies, such as energy efficiency), adapt to climate change (including investments in increased resilience to flooding) and address other environmental issues (maximum 20 percent of proceeds will be invested in these projects).

The Framework contains a comprehensive list of eligible green bond categories, which suggests the framework can be applied beyond the immediate financing needs identified by the Municipality.

CICERO takes a long-term view on climate change, and thus recommends excluding projects that support prolonged use of fossil fuel-based infrastructure that will contribute to emissions in the long run. Nacka Municipality has explicitly stated in their green bond framework that they will not finance nuclear power or fossil fuel-based projects.

The Municipality has specified the process by which projects eligible for green bond financing will be selected, including a detailed description of the Green Bond Council who will supervise the management of the green bond. There is also a detailed plan for how Nacka Municipality intends to report on the green bond.

On the issuer's environmental credentials more broadly, it is clear that Nacka is a Municipality which places high importance on climate change and the natural environment more broadly. It is recognized as a high performer among Sweden's municipalities, most recently being placed as number 16 out of 290. Moreover, it has been placed in the top ten in a competition that involved the best systematic work on hazardous chemicals. In 2017, Nacka Municipality received the first prize in "Municipalityvelometern", as the Sweden's best medium-sized bicycle Municipality.

Moreover, the Municipality shows signs of being genuinely concerned with continually improving its environmental performance. This can be seen in its environmental strategy and goals, which are actively used and reviewed. It regularly updates and publishes indicators, which suggest a high level of commitment.

For investments in sustainable buildings, the use of proceeds from the green bond requires the incorporation of an aim of 25 percent reduction in energy use, which is positive, as energy use is not guaranteed by the applicable building standards.

### **Weaknesses**

There are no obvious weaknesses in the issuer's green bond framework.

### **Pitfalls**

Nacka Municipality does currently not subject its projects to life cycle assessments. We understand that the Municipality is aiming to do so in the future, but as it stands this can be seen as a potential pitfall of the Municipality's impact analysis. Likewise, Nacka Municipality does not EMAS or ISO certification to its activities. Instead the Municipality uses a guidance document which cover many of the same areas as these schemes, however the lack of application of robust standards have the potential to lead to a weakening of performance in these areas.

Nacka Municipality has made clear its plans on reporting for the green bond. This is positive, but impact reporting is currently only required on two out of the nine eligible green bond categories. Nacka Municipality should consider increasing its level of ambition in terms of impact reporting in the coming years.

Nacka Municipality should be aware of the following:

- 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 green buildings. Nacka Municipality should be aware of such effects and possibly avoid Green Bond funding of projects where the risk of rebound effects is particularly high.

In a low carbon 2050 perspective, the energy performance of buildings is expected to be improved, with passive house 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.

# 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 international 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 international 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-carbon 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](http://cicero.oslo.no/greenbonds)

