



The City of Reykjavik Green Finance Second Opinion

11 April 2023

Executive Summary

The City of Reykjavik (“Reykjavik” or “the issuer”) is the capital of Iceland. Employing approximately 12,000 people, Reykjavik is responsible for the provision of public infrastructure and services for the capital area, including education, roads and public transport, recreational and health facilities, social welfare, and waste collection.

Reykjavik expects the biggest share of green financing to be allocated to real estate projects. The plan is to mainly finance new projects. Other planned investments are in clean transportation, waste management, and forest- and wetland reclamation. Changes since the previous framework are introducing new impact indicators, a working group as part of the selection process, CO₂ sequestration and information and communication as new project categories, and additional eligibility criteria for some project categories.

We rate the updated framework **CICERO Medium Green** and give it a governance score of **Excellent**. The overall shading reflects that most proceeds will be allocated to green buildings and that this project category stands out for including criteria for embodied emissions, renewable energy sources, clean transportation, and green building certifications. While the green building project category retains more ambitious criteria than the previous framework, Medium Green more accurately reflects our current understanding of these investment’s climate risks and impacts. Reykjavik has robust procedures and policies that provide a sound context for projects financed under this framework.

Strengths

The criteria for the green building project category address embodied emissions, renewable energy sources, clean transportation, and green building certifications. As Reykjavik has vast access to renewable energy, emissions embodied in building materials represent a large share of buildings’ carbon footprint and it is clear strength that the framework criteria focus on these.

When using the BREEAM certification, Reykjavik requires a minimum certification level as well as the fulfilment of specific criteria to ensure that important environmental considerations are taken into account. The BREEAM certification is a point-based system where some criteria are set as mandatory requirements while some are optional, which can lead to important environmental considerations being neglected. To mitigate against this, Reykjavik has set internal requirements for criteria covering lifecycle costs, energy reductions and low carbon design that BREEAM certified buildings must meet. Another encouraging improvement since the last framework is the inclusion of impact indicators such as the carbon footprint in

SHADES OF GREEN



°CICERO
Medium Green

GOVERNANCE ASSESSMENT



GREEN BOND AND LOAN PRINCIPLES

Based on this review, this framework is found to be aligned with the principles.



tCO₂e/m² and the carbon footprint profile and annual GHG emissions reduced/avoided compared to business as usual (in tCO₂e).

It is positive that the framework activities cover Reykjavik's biggest sources of emissions, such as transportation. Eligible clean transportation projects are public transportation as well as passenger cars with zero tailpipe emissions. Potential projects within clean transportation, wetland reclamation and waste management contribute to emissions mitigation in priority areas.

Pitfalls

There is no quantified energy criterion in the green buildings category. As Iceland has a vast supply of renewable energy, lowering the energy consumption for buildings has not yet been prioritized for construction projects. As the electrification of other sectors increases to support the low carbon transition, one should look to reduce building energy consumption where possible. The Life Cycle Assessment (LCA) Reykjavik performs for its real estate projects includes looking at operational energy use, which mitigates some of this risk, however the framework could benefit from a quantified energy criterion for buildings.



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1 The City of Reykjavik's environmental management and green finance framework

Issuer description

The City of Reykjavik (“Reykjavik” or “the issuer”) is the capital of Iceland with a population of about 137,000 people comprising roughly 1/3 of Iceland’s population and covering an area of approximately 273 square kilometres. Employing approximately 12,000 people, Reykjavik is responsible for the provision of public infrastructure and services for the capital area, including education, roads and public transport, recreational and health facilities, social welfare, and waste collection.

Reykjavik issued its first green bond in 2018 and was the first green bond issuer in Icelandic Kronas (ISK) as well as the first Icelandic issuer to be listed on Nasdaq’s sustainable bond index. Under the previous framework, Reykjavik issued a total of ISK 2.039 million of green bonds in 2022, and approximately ISK 19,3 billion in total since 2018. Changes since the previous framework are introducing new impact indicators, a working group as part of the selection process, CO₂ sequestration and information and communication as a new project category, and additional eligibility criteria for some project categories.

Sector risk exposure

Physical climate risks. Iceland is at risk from a variety of hazards due to its unique location. These include extreme snowstorms and cold, storm surges, and glacial outburst floods, snow avalanches and more frequent landslides primarily where there is permafrost in the mountains, floods, and drift ice. Globally, it is also expected that various physical climate risks will increase supply chain disruptions.

Transition risks. Due to the profound changes needed to limit global warming to 2°C, transition risk affects both corporates and local governments. Iceland aims to achieve carbon neutrality before 2040 and to cut greenhouse gas emissions by 40% by 2030 under the Paris Agreement. Reykjavik is exposed to transition risks from stricter national regulations, energy efficiency requirements, stricter climate policies, etc.

Environmental risks. A city is responsible for several vital areas; therefore, Reykjavik is associated with heavily emitting sectors such as transportation, industrial processes, the construction sector, and shipping. Consequently, Reykjavik is at risk of polluting the local environment, such as during the construction of properties, e.g., from poor waste handling. City growth can also cause biodiversity risks that should be managed.



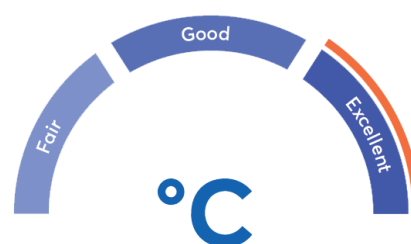
Governance assessment

Reykjavik has solid procedures in place and both short-term and long-term targets. It has a well-defined 2021-2025 action plan to start transitioning to a low-carbon society. It is encouraging that it has started using LCA for its real estate projects and has included a framework criterion for green buildings that using LCA is mandatory. An example of the integration of sustainability procedures in its daily operations is the implementation of evaluation criteria that looks at the environmental management and the procurement of materials in tender processes with contractors.

Project selection and decision-making procedures are established. The selection process has been strengthened since the last framework by introducing a working group to improve cooperation between the owners of the investment, the developer, and those who finance it. There is also an ambition to use the EU Taxonomy Do-No-Significant-Harm (DNSH) criteria as guidelines for the selection process.

Reporting is done on a project category basis. We welcome the introduction of new impact indicators and Reykjavik's ambition to strengthen its impact reporting.

The overall assessment of Reykjavik's governance structure and processes gives it a rating of **Excellent**.



Environmental strategies and policies

Reykjavik has policies in place to support its ambition to become climate neutral by 2040.¹ It has set a climate action plan for 2021-2025 to define priorities to achieve carbon neutrality. There are six prioritized objectives: (1) walkable city, (2) energy exchange, (3) health promoting modes of travel, (4) green structures, (5) circular thinking, and (6) carbon sequestration. The action plan includes 15 main actions with the focus on reducing greenhouse gas emissions by 300,000 tons CO₂e prior to 2030 and adapting to climate change. The plan includes the status of environmental targets as of 2020, as well as indicators to measure performance for 2025 and 2030. This action plan will be revised in 2023.

Reykjavik reports emissions using a methodology called the City Inventory Reporting and Information System. The methodology is based on the Greenhouse Gas Protocol (GHGP). The emission reporting includes scope 1 and scope 2 emissions, as well as some scope 3 categories. Total emissions are 628,465 tCO₂e, including scope 3, where around 60% of reported emissions are associated with transportation (382,300 tCO₂e), while the remaining emissions come from energy (33,880 tCO₂e), waste (53,894 tCO₂e), agriculture, forestry and other land use (48,076 tCO₂e) and industrial processes and product use (110,315 tCO₂e). About 85% of the total energy supply in Iceland is derived from domestically produced renewable energy sources.² In 2021, Reykjavik Energy reported an emission factor of 7.7 gCO₂e/kWh.³

In 2017, Reykjavik mapped the main risk factors due to climate change in the city. Reykjavik maps and measures risk due to rising sea levels as this has been identified as the main threat. Reykjavik is looking into approaches to mitigate climate risk and aim to use the Task Force on Climate-Related Financial Disclosures (TCFD) recommendations in that work.

¹ While the official target is to become climate neutral by 2040, Reykjavik is aiming on carbon neutrality by 2030 as a participant of the EU mission of climate neutral and smart cities 2030.

² [Government of Iceland | Energy](#)

³ [101197-MEM Reykjavik Emissions Inventory 2021\[19\].pdf \(reykjavik.is\)](#)



Iceland has set a roadmap for sustainable construction. The roadmap includes a study of emissions linked to the real estate sector in Iceland today, as well as a 2030 reduction target of 43%. The study has also set quantified sub-targets for materials linked to construction, the construction phase, refurbishments, and the operational stage. There has now been formed a working group that are looking on possible measures to reach set targets. Reykjavik is responsible for several actions in the roadmap.

In tendering processes, requirements for the contractor can include the contractor's environmental management and the procurement of materials. Reykjavik is considering including the use of non-fossil fuel equipment as an evaluation criterion.

As the largest proportion of emissions within Reykjavik comes from transportation, the city has set a strategy to reduce these emissions. This strategy entails implementing 15-minute neighbourhoods (i.e., city hubs that have everything residents need, such as access to nature and services including grocery stores, healthcare, libraries and swimming pools accessible in 15 minutes by walking or cycling), a cycling plan, and a bus transit system.

Reykjavik has been chosen to be one of 112 climate-neutral and smart cities by the EU Commission. Reykjavik is also involved in the Race to Zero, Race to Resilience, Support of the Paris Agreement, C40 – Reinventing Cities, and on a more local level of cooperating with Festa, the Center for Corporate Social Responsibility.

Green finance framework

Based on this review, this framework is found to be aligned the Green Bond Principles and Green Loan Principles. For details on the issuer's framework, please refer to the green finance framework dated April 2023.

Use of proceeds

For a description of the framework's use of proceeds criteria, and an assessment of the categories' environmental impacts and risks, please refer to section 2.

Selection

A green finance working group will analyse possible new eligible projects, which will be overseen by the treasury department. The working group has environmental competence. New projects are then evaluated by the Department of Environment and Planning. They evaluate adherence to the framework criteria and other relevant regulations. The green finance working group then reviews these new projects to develop a proposal list of eligible projects.

Subsequently, the proposal of eligible projects is sent to the selection committee, comprised of the director of finance and risk management, director of environment and planning, and head of the office of public property. The selection committee will approve the proposal of projects that are sent to the city executive council for final approval. Consensus needs to be reached within the selection committee for any net proceeds to be used. This decision will be documented. After city executive council approval, the approved projects will be defined as green projects in the green registry. The selection committee does not have an environmental expert, however, if an expert opinion is needed then external experts are consulted, where Reykjavik has a fixed contract for three years in this regard.

The selection committee will convene every six months or when considered necessary. If a green project is sold, or for other reasons loses its eligibility, funds will then follow the procedure under the management of proceeds until allocated to other eligible green projects. In the evaluation and selection of eligible projects, the working group will also consider aspects such as human and labour rights and the avoidance of significant harm to other



environmental objectives as defined in the EU Taxonomy, international and local environmental standards, and local laws and regulations.

Management of proceeds

Proceeds will be managed by Reykjavik’s Department of Finance and Risk Management. An amount equal to net proceeds will be credited to a special account. The account will fund eligible projects. Reykjavik intends to fully allocate proceeds from any financing within 36 months of the date of funding.

Temporary investments could be e.g., deposits with commercial banks, money market deposits, bills of exchange, secured commercial bank bonds, or government-guaranteed securities.

Reporting

Reykjavik commits to providing a publicly available annual allocation and impact report. The allocation of financing to eligible projects and assets will be disclosed by project category. The reporting will be conducted in line with best market practices and international guidelines and protocols. Reykjavik will have its allocation reporting reviewed by an external auditor. External experts will either verify or prepare impact reporting.

Allocation reporting will include:

- A summary of financing activities
- Types of financing activities
- Outstanding amounts
- Balance of unallocated proceeds
- New vs. refinancing ratio
- Project category allocation
- An example list of projects financed

For impact reporting, methodologies and impact indicator results will be included. Potential impact indicators are listed in the table below. Reykjavik informs us that focus will be on giving investors information they understand regarding the impact of the investments.

Project Categories	Impact Indicators
Green buildings	<p>New buildings:</p> <ul style="list-style-type: none"> • Carbon footprint in tCO₂e/m² and the carbon footprint profile • Annual energy use reduced/avoided compared to business as usual (in MWh) • Annual GHG emissions reduced/avoided compared to business as usual (in tCO₂e) <p>Existing buildings:</p> <ul style="list-style-type: none"> • Annual energy use reduced/avoided compared to business as usual (in MWh). The energy criteria in BREEAM-in-use will be used. • Annual GHG emissions reduced/avoided compared to business as usual (in tCO₂e) <p>Major renovations:</p> <ul style="list-style-type: none"> • Annual energy use reduced/avoided compared to business as usual (in MWh) • Annual GHG emissions reduced/avoided compared to business as usual (in tCO₂e) <p>Climate change risk and resilience:</p> <ul style="list-style-type: none"> • Physical climate risk outlined and adaptation measure outcome (quantified if possible) • Impact on increased resilience to climate change



	<p>Other:</p> <ul style="list-style-type: none"> • Number of certified buildings (into categories, i.e., Nordic Swan Ecolabel and/or BREEAM) per year. Including the scores for each project • Distance (in km) to public transportation
Energy efficiency	<ul style="list-style-type: none"> • Annual energy reduced/avoided (in MWh) compared to pre-investment (in MWh) • Annual GHG emissions reduced/avoided (in tCO₂e) compared to pre-investment
Clean transportation	<ul style="list-style-type: none"> • Proportion of clean transportation vehicles in new registrations in Reykjavík, by category of vehicles and energy sources. It is targeting reporting on both private vehicles and the city's vehicles if necessary data is available. • The total number of electricity charging, methane, and hydrogen stations in Reykjavík. • Number of vehicles per fast charging station • Percentage of people walking or who use public transport, bicycles, scooters, and electric bicycles when traveling. This will be measured with surveys. • Estimated reduced/avoided GHG emissions (in tCO₂e) per year • Biking or walking lanes (in km)
Pollution prevention and control / Circular economy	<ul style="list-style-type: none"> • Estimated reduced/avoided GHG emissions (in tCO₂e) per year
Environmentally sustainable management of living natural resources and land use	<ul style="list-style-type: none"> • Area (hectares) transformed or reclaimed by type and objective • Area (hectares) conserved or protected • Estimated reduced / avoided / sequestered GHG emissions (in tCO₂e) per year. This will be estimated by environmental specialists⁴
Climate change adaptation	Reykjavik plans to describe projects so that investors know what risks are being prevented and how they are prevented.
CO ₂ sequestration	<ul style="list-style-type: none"> • Estimated sequestered CO₂ emissions (in tonnes) per year in capital area • Number of sequestration projects in capital area
Information and communication	<ul style="list-style-type: none"> • Number of ICT projects in works • Average energy intensity of data centres • Average carbon footprint of data storage.

Table 1. Impact indicators

In past reporting, the city disclosed that proceeds have been allocated to five out of six project categories. Previously, the vast majority of proceeds (fluctuating between 87.2%-47.1%) were allocated to the green building category. Clean transportation and waste management received the next largest shares of allocated proceeds. The reporting has been by project category and focused on allocated proceeds and avoided emissions. The issuer provided transparency on methodologies.

⁴ Estimated impact will be based on this report: [losun_ghl_vegna_landnotkunar_i_reykjavik_vironice_april_2020_endursk.pdf](#)



2 Assessment of the City of Reykjavik’s green finance framework

The eligible projects under the City of Reykjavik’s green finance framework are shaded based on their environmental impacts and risks, based on the “Shades of Green” methodology.

Shading of eligible projects under the City of Reykjavik’s green finance framework

- It is expected that there will be a split between new financing and refinancing, where the biggest share will be new financing. There is a lookback period of six years.
- Reykjavik expects that new buildings, such as schools, under the project category green buildings will receive the biggest share of financing. Investments in clean transportation, waste management, and forest- and wetland reclamation may increase.
- In 2021, 87.2% of allocated proceeds went to projects under the green building category, where a combined kindergarten, elementary school and after-school recreational centre, a swimming pool, a sports complex, and a culture hall were financed. Other projects that received financing were the construction of cycling and walking paths, biogas-powered garbage trucks, the reclamation of wetlands, charging stations, and the production of biogas.
- Net proceeds will not be allocated to assets, projects, or entities related to activities or sectors in fossil fuel generation, use or machinery, nuclear energy generation, research and/or development within weapons and defence, environmentally negative resource extraction (such as rare-earth elements or fossil fuels), gambling, alcoholic beverages or tobacco, whaling, livestock, or crypto-currency mining.

Category	Eligible project types	Green Shading and considerations
Green buildings	<p>Criteria for new construction, acquisition of buildings, leasing, operations, renovation, and refurbishment of existing buildings, distinguished by the outlined three categories below, are the following:</p> <ul style="list-style-type: none"> • $\geq 2000 \text{ m}^2$, must be certified in line with the following criteria: 	<p>Medium Green</p> <ul style="list-style-type: none"> ✓ This category receives a Medium Green because of solid framework criteria focusing on embodied emissions, renewable energy sources, clean transportation, and green building certifications. There are however no quantified thresholds for embodied emission reductions or energy consumption. ✓ While the green building project category retains more ambitious criteria than the previous framework that received a Dark Green shading, Medium Green



- LEED “Gold”, BREEAM (including BREEAM in-use) “Excellent” The Nordic Swan Ecolabel certification”, or similar, and always including all specific criteria (see below)

- < 2000 m², must be certified in line with the following criteria:

- LEED “Silver”, BREEAM (including BREEAM in-use) “Very good”, The Nordic Swan Ecolabel certification”, or similar, and always including all specific criteria (see below)

Specific criteria applying to both categories:

- Assessment of climate risk and resilience
- Life-cycle assessment are required, including embodied or embedded emissions, and materials are chosen based on life cycle considerations

- Electricity and space heating from 100% renewable energy sources.

- Solutions for a car-free living and electric charging stations fuelled with 100% renewable energy sources

Cost associated with certified urban development using BREEAM or similar certification scheme.

more accurately reflects our current understanding of these investments’ climate risks and impacts.

- ✓ It is encouraging that Reykjavik has started to use LCA⁵ actively when designing new buildings and has included this process as a framework criterion. This has already been done for five different projects, where the emission intensities have been calculated to be between 400-850 kgCO₂e/m².

- ✓ According to the issuer’s estimates, emission intensities have been around 25% lower than reference buildings when using LCA in the design phase. LCA has been used to reduce the amount of materials used, e.g., the amount of cement in concrete, as well as looking at operational energy emissions. It has also been used to assess the carbon footprint of different flooring options and walls.

- ✓ Green building certification standards cover a broad set of issues that are important to sustainable development. At the same time, they differ considerably in their requirements. Reykjavik informed us that for now, it is planning to use the BREEAM and the Nordic Swan certifications. The BREEAM certification is a point-based system where some criteria are set as mandatory requirements while some are optional, which can lead to important environmental considerations being neglected. To mitigate against this, Reykjavik has set internal requirements for criteria it must meet in the BREEAM certification. Criteria include e.g., calculating life cycle costs, energy reductions, and low carbon design.

- ✓ It is important to be aware of the difference between a design-phase certification and an in-use certification, as the structure and requirements of the two are very different. An in-use certification can be a solid way of

⁵ The LCA is performed in accordance with EN15978 using the software OneClick LCA.



ensuring that the management of assets enables continued improved energy performance, however, they seldom include specific energy efficiency criteria, and the point-based system does not guarantee a low-carbon building. Reykjavik is looking into using the in-use certifications and is also considering the introduction of mandatory criteria as it has done for design-phase certifications.

- ✓ Regarding the criteria for climate risk and resilience, Reykjavik includes a screening of climate change risks, such as 4m and 6m flooding, along with other scenarios and impacts.
- ✓ Costs associated with certified urban development are something Reykjavik is exploring; however this will constitute a minor share of financing if any. There is no threshold for the certification level as the municipality has no experience with this as of now.

Energy efficiency

Expenditures for technologies, products, and installation for the purpose of reducing energy consumption. 30% increase in energy efficiency should be achieved.



Medium to Dark Green

- ✓ Focusing on improving energy performance is essential to decrease the climate footprint in most sectors. The issuer has informed us that main investments will be in energy efficiency measures for buildings and streetlight, such as: i) LED lights, ii) renewal of cladding, and iii) 3-fold glass for insulation.
- ✓ While the energy efficiency project category retains similar criteria as the previous framework that received a Dark Green shading, Medium to Dark Green more accurately reflects our current understanding of these investments' climate risks and impacts.
- ✓ Focusing on improving energy performance in existing buildings is essential to decrease the climate footprint of the real estate sector.



Clean transportation⁶



Public transport:

- Passenger land transport activities (i.e., busses, trains, and trams)⁷
- Inland passenger water transport (e.g. ferries)⁸

Passenger cars and light commercial vehicles:

- Vehicles of category M1, N1, and L, including where applicable NACE 49.32, 49.32, 53.10, 53.20, 77.11.⁹

Heavy duty vehicles:

- Heavy duty vehicles, such as waste collection vehicles and other N2 and N3 vehicles¹⁰

Infrastructure for low carbon transport:

- ✓ Measures will undergo a LCA and LCC to ensure that identified measures result in 30% energy efficiency improvement.

Dark Green

- ✓ Transport with zero tailpipe CO₂e emissions is vital to decarbonize the transport sector.
- ✓ Electric modes of transportation are important in low-carbon solutions. Investors should however be aware of the indirect GHG emissions stemming from the production and use of new vehicles. The production of such vehicles, in particular the production of batteries and the sourcing of raw materials, can have substantial climate and environmental impacts.
- ✓ Note that biofuel sourcing could include climate risks, such as from direct and indirect land use change and transportation emissions. The biofuel element is considered to be a Medium Green element in the project category. Be aware of lifecycle emissions and broader impacts on biodiversity and the environment.
- ✓ Biofuels must comply with EU Renewable Energy Directive (RED). The issuer informs us that for liquid biofuels, only rapeseed oil that has a valid

⁶ Threshold: All fossil fuel-based vehicles and hybrids are strictly excluded under this project category.

⁷ Threshold: Zero direct emission transport activities (fully electrified or fuel cell). Vehicles using biomethane from anaerobic digestions from biowaste which would otherwise have been released into the atmosphere from dedicated waste treatment plants are also eligible.

⁸ Threshold: Zero direct emissions inland waterway vessels are eligible. Dedicated vessels solely using advanced biofuels or renewable liquid and gaseous transport fuels of non-biological origin as defined in Art. 2 (34) and Art. 2 (36) in line with Directive (EU) 2018/2001, guaranteed either by technological design or ongoing monitoring and third-party verification. In addition, for an investment in new vessels, only vessels with efficiency corresponding to direct emissions below 95g CO₂ e /pkm (including biogenic CO₂) are eligible.

⁹Threshold: For passenger cars and light commercial vehicles: Zero tailpipe emission vehicles (incl. hydrogen, other fuel cell, electric) are automatically eligible. For category L vehicles: Zero tailpipe emission vehicles (incl. hydrogen, fuel cell, electric) are eligible. Vehicles using biomethane from anaerobic digestions from biowaste which would otherwise have been released into the atmosphere from dedicated waste treatment plants are also eligible.

¹⁰ Threshold: Zero direct emission heavy-duty vehicles that emits less than 1g CO₂/kWh (or 1g CO₂ /km for certain N2 vehicles) are automatically eligible. Dedicated vehicles solely using advanced biofuels (only biomethane from anaerobic digestions from biowaste which would otherwise have been released into the atmosphere from dedicated waste treatment plants are also eligible) or renewable liquid and gaseous transport fuels of non-biological origin as defined in Art. 2 (34) and Art. 2 (36) as well as low indirect land-use change-risk biofuels as defined in Art 2(37) in line with Directive (EU) 2018/2001, guaranteed either by technological design or ongoing monitoring and third-party verification. In addition, for an investment in new vehicles, only vehicles with efficiency corresponding to direct CO₂ emissions (gCO₂/ km) (biogenic CO₂) below the reference CO₂ emissions of all vehicles in the same sub-group are eligible. Eligibility should be reviewed latest by 2025.or when Directive (EU) 2018/2001) is reviewed.



- Any construction, expansion, equipment, and improvement of infrastructure for active mobility (walking, cycling, e-bikes, and e-scooters) and vehicles and public transport as defined above¹¹.

certification from any of the voluntary schemes for biofuels approved by the EU Commission is eligible.

- ✓ Generating biofuels from landfill gas can avoid methane emissions to the atmosphere. As with any activity, the production and use of biogas entail some emissions (including methane leakage). These environmental impacts should be minimized.
- ✓ Reykjavik is collaborating with Vegagerðina, Ístak, Efla to prepare a calculation tool to calculate the carbon footprint of traffic infrastructure design. When the tool is ready it will be mandatory to use for infrastructure projects to reduce emissions in its design.

Pollution and prevention and control / circular economy



Funding to facilitate waste reduction in line with the City's Zero Waste 2025 policy, and better waste management:

- According to changes in the law on waste management, which were approved in July 2021 and are intended to create conditions for formation of a circular economy, it will be mandatory to separately collect organic kitchen waste, plastic, and paper and cardboard via door-to-door collection. Then it will also be obliged to separately collect textiles, metals, and glass in drop of centers (bring system) in the local environment of residents. The changes are valid from January 1, 2023. The implementation is estimated to take place between May – October 2023.
- Sorpa, the municipal association receiving and handling waste from the municipalities in the capital area has calculated per-person amounts for different waste categories based on the annual waste composition analysis of the general household waste for landfill. In a conservative estimate Sorpa has predicted the amount of paper in the unsorted general waste to

Medium Green

- ✓ The city of Reykjavik has solid waste management policies to ensure that waste is sorted and recycled where possible.
- ✓ Biogas-powered garbage trucks and waste bins are expected to be the main investments under this project category.
- ✓ Methane leakage from e.g., biogas production and storage, energy generation, and digestate storage is controlled by a monitoring plan.
- ✓ Although biogas can cut emissions relative to fossil fuels, concerns remain regarding lifecycle emissions benefits. As the framework considers waste-based biogas exclusively there are fewer deforestation and biodiversity concerns.
- ✓ Fossil fuel vehicles cannot be financed.

¹¹ Threshold: Infrastructure needs to be fundamental to the operation of the mode of transport to be eligible.



go down 5.4 kg/person (amount avoided) in 2024 compared to 2021, from 13.7 kg paper/person to 8.3 kg paper/person (-40%). The reduction of plastics in general waste is estimated to be 7.8 kg/person (amount avoided), from 22.3 kg plastics/person to 14.5 kg/person (-35%). The estimated reduction of organic household waste to landfill is 38.8 kg/person (amount avoided), or from 66 kg/person in 2021 to estimated 27.2 kg per person in 2022.

- Avoided emissions are estimated 50 kg CO₂eq./per/yr.
- Waste fees in Reykjavík have been paid according to the pay-as-you-throw (PAYT) scheme for several years. So, we consider that Reykjavík already complies to this requirement. The PAYT system is a volume-based scheme, based on the size of the container emptied and type of waste. A fixed fee is paid for drop off (*icl. grenndarstöðvar*) and recycling stations (*icl. endurvinnslustöðvar*).
- Separate collection and transport in source segregated fractions of non-hazardous waste and material recovery from separately collected nonhazardous waste ^{12,13}
- Anaerobic digestion of bio-waste¹⁴
- Composting of bio waste¹⁵

¹² Threshold: Eligible if waste (single or co-mingled fractions) is collected separately for the purpose of preparation for reusing and/or recycling.

¹³ Threshold: It should produce secondary raw materials suitable for substitution of virgin materials in production processes and, at least 50%, in terms of weight, of the processed separately collected nonhazardous waste is converted into secondary raw materials.

¹⁴ Threshold: Eligible if: bio-waste is source segregated and collected separately; methane leakage is monitored; the produced biogas is used directly for the generation of electricity and/or heat, or upgraded to bio-methane for injection in the natural gas grid, or used as vehicle fuel (e.g. as bioCNG) or as feedstock in chemical industry (e.g. for production of H₂ and NH₃); the digestate produced is used as fertiliser/soil improver – directly or after composting or any other treatment; in dedicated bio-waste treatment plants, bio-waste shall constitute a major share of the input feedstock (at least 70%, measured in weight, as an annual average).

¹⁵ Threshold: Eligible if: bio-waste is source segregated and collected separately; anaerobic digestion is not a technically and economically viable alternative; the compost produced is used as fertiliser/soil improver.



Environmentally sustainable management of living natural resources and land use

Wetland reclamation and forestry¹⁶ within Reykjavik's management and/or through partnerships outside of the City's geographical boundaries.^{17,18}

Documentation and preservation of biodiversity in urban planning



Dark Green

- ✓ Only 1 % of land is covered by forests in Iceland, with some 36 % being grassland and 9 % wetland. Enhanced action on forestry and revegetation, land conservation, including of wetlands, have an important role to play to increase carbon sequestration and reduce emissions. The overall climatic effects of forestry are uncertain. Investments in wetland reclamation are welcome.
- ✓ Reforestation and afforestation may have risks of negatively impacting biodiversity, which should be mitigated.
- ✓ The main investment in this project category is expected to be in maintaining the biodiversity, productivity, and vitality of forests.
- ✓ Wetland reclamation investments are the reconstruction of degraded wetlands, where they will be reconstructed as closely as possible to their original condition with respect to hydrological, ecological and morphological components.

Climate change adaption

Mapping of climate change risks, including review of current flood prevention

Funding of resilience infrastructure, including blue-green/self-sustaining surface water solutions and flood control installations



Dark Green

- ✓ Climate scientists are clear when communicating that some level of climate change is unavoidable even in the most optimistic climate scenarios. It is therefore crucial to plan and mitigate potential risks to reduce the potential financial and environmental impact of such events.
- ✓ For measures that require construction and the use of vessels, emission intensity and resilience of materials and equipment should be considered.

¹⁶ Threshold: A forest that maintains their biodiversity, productivity, regeneration capacity, vitality, and their potential to fulfil, now and in the future, relevant ecological, economic, and social functions.

¹⁷ Threshold: Land conversion and/or restoration must have the following; relevant management system, established baseline GHG balance, and be projected to heighten above ground carbon stock over the baseline over time.

¹⁸ Threshold: Conversion of high carbon stock land, (i.e., primary forest, peatlands, wetlands, and grasslands) which has had this status since January 2008 or after should not be converted.



There should also be considerations on how measures impact the local environment.

- ✓ The issuer has confirmed that the framework’s generation exclusion of activities or sectors in fossil fuel generation, use or machinery also applies in this project category.

CO₂ sequestration

All expenses supporting the development, construction, installation and maintenance of projects to sequester and/or mineralize GHG emissions connected to the local activities of the residents and businesses.



Medium to Dark Green

- ✓ CCS is a critical component of a sustainable low-carbon future.
- ✓ The Medium to Dark shading reflects a lack of specificity in the eligibility criteria, including a lack of quantitative eligibility criteria for investments under this project category.
- ✓ The issuer informed us that this category is broad to provide flexibility to finance emerging technologies and solutions. This could be similar to CarbFix.¹⁹

Information and communication

Expenditures enabling storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of diversity of data through data centers, including edge computing. Data centres include the following equipment: ICT equipment and services; cooling; data centre 20 power equipment; data centre power distribution equipment; data centre building; monitoring systems.



Medium Green

- ✓ Digital solutions are expected to be an important enabling technology for climate mitigation and adaptation strategies. However, we note there are trade-offs in emissions and energy use from the increasing demand for data centres while reducing emissions in other sectors. The extent of material climate benefits from digitalisation and expanding networks is still disputed.
- ✓ Processing and storing ever-greater amounts of data while limiting energy use and environmental impact is a key challenge for data centres. Energy

¹⁹ CarbFix is an academic-industrial partnership that has developed an approach to capture and store CO₂. In 2021, CarbFix captured 35% of emissions from its largest geothermal plant Hellisheiði. By 2025, OR plans to expand the carbon capture and storage plant at Hellisheiði with the aim to capture 95% of the CO₂ coming from the power plant.

²⁰ The data centre implements the European Code of Conduct for Data Centre Energy Efficiency.



Development and/or use of ICT solutions that are aimed at collecting, transmitting, storing data and at its modelling and use when these activities are exclusively aimed at the provision of data and analytics for decision making (by the public and private sector) enabling GHG emission reductions.

efficiency needs to be address, along with making the centres resilient to expended changes in climate.

- ✓ It is the responsibility of Reykjavik to ensure that financed projects are exclusively aimed at enabling GHG emission reductions. The issuer informs us that projects will be analyzed for this criterion on a case-by-case basis.
- ✓ Reykjavik has confirmed that crypto-currency data mining is not included under the framework. Crypto-currency mining is globally a significant emissions concern because the mining process is energy intensive.

Table 2. Eligible project categories









3 Terms and methodology

This note provides CICERO Shades of Green’s second opinion of the client’s framework dated April 2023. This second opinion remains relevant to all green bonds and/or loans issued under this framework for the duration of three years from publication of this second opinion, as long as the framework remains unchanged. Any amendments or updates to the framework require a revised second opinion. CICERO Shades of Green 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.

The second opinion is based on a review of the framework and documentation of the client’s policies and processes, as well as information gathered during meetings, teleconferences and email correspondence.

‘Shades of Green’ methodology

CICERO Shades of Green second opinions are graded dark green, medium green or light green, reflecting a broad, qualitative review of the climate and environmental risks and ambitions. The shading methodology aims to provide transparency to investors that seek to understand and act upon potential exposure to climate risks and impacts. Investments in all shades of green projects are necessary in order to successfully implement the ambition of the Paris agreement. The shades are intended to communicate the following:

Shading	Examples
 Dark Green is allocated to projects and solutions that correspond to the long-term vision of a low-carbon and climate resilient future.	 Solar power plants
 Medium Green is allocated to projects and solutions that represent significant steps towards the long-term vision but are not quite there yet.	 Energy efficient buildings
 Light Green is allocated to transition activities that do not lock in emissions. These projects reduce emissions or have other environmental benefits in the near term rather than representing low carbon and climate resilient long-term solutions.	 Hybrid road vehicles

The “Shades of Green” methodology considers the strengths, weaknesses and pitfalls of the project categories and their criteria. The strengths of an investment framework with respect to environmental impact are areas where it clearly supports low-carbon projects; weaknesses are typically areas that are unclear or too general. Pitfalls are also raised, including potential macro-level impacts of investment projects.

Sound governance and transparency processes facilitate delivery of the client’s climate and environmental ambitions laid out in the framework. Hence, key governance aspects that can influence the implementation of the green bond are carefully considered and reflected in the overall shading. CICERO Shades of Green considers four factors in its review of the client’s governance processes: 1) the policies and goals of relevance to the green finance framework; 2) the selection process used to identify and approve eligible projects under the framework, 3) the management of proceeds and 4) the reporting on the projects to investors. Based on these factors, we assign an overall governance grade: Fair, Good or Excellent. Please note this is not a substitute for a full evaluation of the governance of the issuing institution, and does not cover, e.g., corruption.



Assessment of alignment with Green Bond Principles

CICERO Shades of Green assesses alignment with the International Capital Markets' Association's (ICMA) Green Bond Principles. We review whether the framework is in line with the four core components of the GBP (use of proceeds, selection, management of proceeds and reporting). We assess whether project categories have clear environmental benefits with defined eligibility criteria. The Green Bonds Principles (GBP) state that the “overall environmental profile” of a project should be assessed. The selection process is a key governance factor to consider in CICERO Shads of Green's assessment. CICERO Shades of Green typically looks at how climate and environmental considerations are considered when evaluating whether projects can qualify for green finance funding. The broader the project categories, the more importance CICERO Shades of Green places on the selection process. CICERO Shades of Green assesses whether net proceeds or an equivalent amount are tracked by the issuer in an appropriate manner and provides transparency on the intended types of temporary placement for unallocated proceeds. Transparency, reporting, and verification of impacts are key to enable investors to follow the implementation of green finance programs.



Appendix 1: Referenced Documents List

Document Number	Document Name	Description
1	The City of Reykjavik Green Finance Framework April 2023	
2	2021 Annual Green Bond Impact Report	
3	2020 Annual Green Bond Impact Report	
4	2019 Annual Green Bond Impact Report	
5	2018 Annual Green Bond Impact Report	
6	Reykjavik Emission Inventory 2021	



Appendix 2: About CICERO Shades of Green

CICERO Shades of Green is a subsidiary of the climate research institute CICERO. CICERO is Norway's foremost institute for interdisciplinary climate research. We deliver new insight that helps solve the climate challenge and strengthen international cooperation. CICERO has garnered attention for its work on the effects of manmade emissions on the climate and has played an active role in the UN's IPCC since 1995. CICERO staff provide quality control and methodological development for CICERO Shades of Green.

CICERO Shades of Green provides second opinions on institutions' frameworks and guidance for assessing and selecting eligible projects for green bond investments. CICERO Shades of Green is internationally recognized as a leading provider of independent reviews of green bonds, since the market's inception in 2008. CICERO Shades of Green 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 Green operates independently from the financial sector and other stakeholders to preserve the unbiased nature and high quality of second opinions.

We work with both international and domestic issuers, drawing on the global expertise of the Expert Network on Second Opinions (ENSO). Led by CICERO Shades of Green, ENSO contributes expertise to the second opinions, and is comprised of a network of trusted, independent 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, the International Institute for Sustainable Development (IISD) and the School for Environment and Sustainability (SEAS) at the University of Michigan.

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- ★ **2021 Largest External Reviewer**, Climate Bonds Initiative Awards
 - ★ **2020 External Assessment Provider Of The Year**, Environmental Finance Green Bond Awards
 - ★ **2020 Largest External Review Provider In Number Of Deals**, Climate Bonds Initiative Awards
 - ★ **2019 External Assessment Provider Of The Year**, Environmental Finance Green Bond Awards
 - ★ **2019 Largest Green Bond SPO Provider**, Climate Bonds Initiative Awards
 - ★ **2018 External Assessment Provider Of The Year**, Environmental Finance Green Bond Awards
 - ★ **2018 Largest External Reviewer**, Climate Bonds Initiative Awards
 - ★ **2017 Best External Assessment Provider**, Environmental Finance Green Bond Awards
 - ★ **2016 Most Second Opinions**, Climate Bonds Initiative Awards