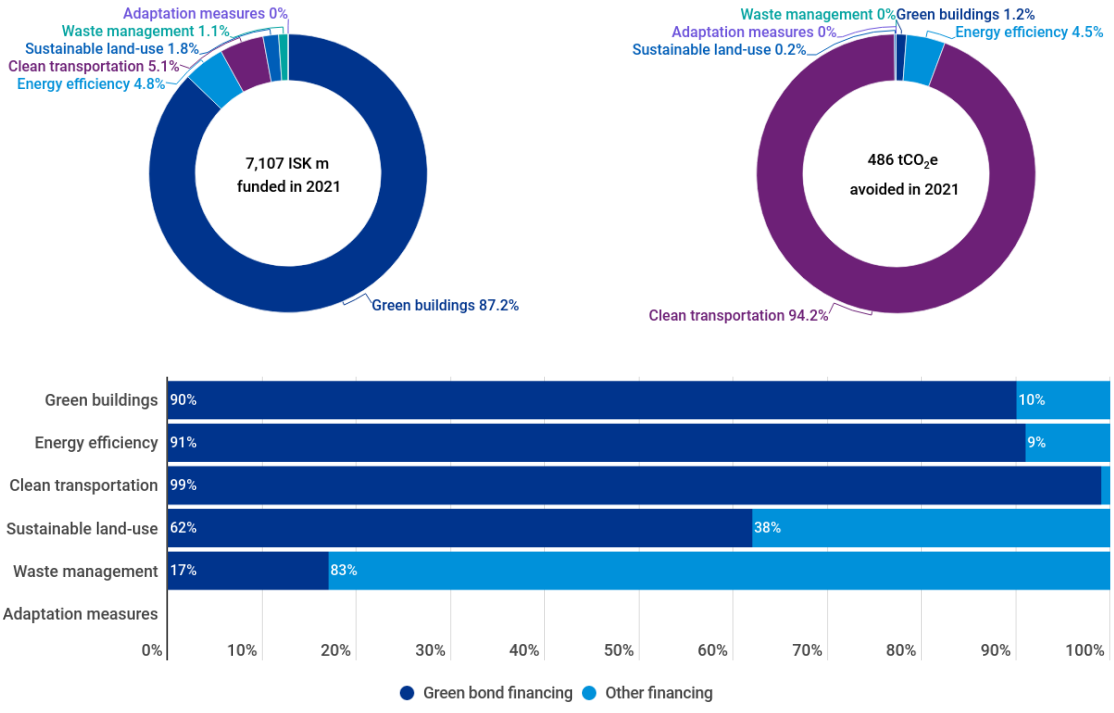
City of Reykjavík
Borgartún 12-14
105 Reykjavík

2021 Annual Green Bond Impact Report

In December 2018, the City of Reykjavík, the capital city of Iceland, established a Green Bond Framework with a refinancing look-back period to 2016, under which it has issued Green Bonds. City of Reykjavík (Reykjavík) was the first issuer of Green Bonds in Icelandic Kronas (ISK) as well as having been the first Icelandic issuer to be listed on Nasdaq's sustainable bond index. Reykjavík's Green Bond Framework received a second opinion from CICERO Shades of Green, a leading global provider of second opinions. Reykjavík received a 'dark green' rating on the overall framework and for each of the underlying project categories. In addition, it received an 'excellent' rating for its Green Bond governance.

In the year 2021 it issued a total of ISK 6,508 m of Green Bonds and used ISK 7,107 m to fund Eligible Projects (as defined in the Framework), the outstanding amount at year-end was ISK 0 m. The financed Eligible Projects in 2021 resulted in total avoided emissions of 486 tCO_2e, but the overall impact in 2021 from projects funded under the framework is considerably higher.[1] The donut graphs show the distribution of financing (left) and the avoided emissions (right). The tables on next page show accumulated funding and impacts from the funded Eligible Projects. Majority of the impact comes from projects under the clean transportation category, walking and cycling paths contributing the most. However, there was less usage of the paths in 2021 compared to previous years, likely due to bad weather.



[1] For Eligible Projects funded by financing activities in the years 2019 and 2020, the resulting avoided emissions are 44,548.5 tCO_2e in the year 2021. The overall impact in 2021 is thus 485.7 + 44,548.5 = 45,034.2 tCO_2e as reflected in Table 2 on page 2.

Table 1: Overview of funding to each eligible project funded under RVK's Green Bond Framework and % of total investement to date.

Eligible Project category	Eligible Project	2016	2017	2018	2019	2020	2021	Green funding	% of total investment to date
Green buildings	Sundhöll Reykjavíkur	478	800	-	-	-	-	1,277	89%
	Skóli	918	885	1.721	1,245	412	264	5,444	99%
	Menningarmiðstöð	25	53	51	220	246	356	950	89%
	Sundlaug Úlfarsbraut	-	-	15	379	361	497	1,252	90%
	Íþróttahús	1	3	15	506	1,148	1,817	3,491	77%
	Hverfastöð	126	183	127	803	21	4	1,264	100%
Energy efficiency	LED götulýsing	37	89	68	277	423	365	1,259	91%
Clean transportation	Göngu- og hjólreiðastígar	445	237	504	354	320	355	2,215	100%
	Umhverfisvænar sorpbifreiðar	98	-	42	-	-	-	141	100%
	Rafmagnsbifreiðar	-	12	-	3	49	-	65	100%
	Hleðslustöðvar	-	8	67	8	82	37	202	90%
Sustainable land-use	Endurheimt votlendis	-	-	4	15	14	11	45	74%
	Skógrækt	-	-	-	-	9	19	28	57%
	Græna netið	-	-	-	-	74	90	163	60%
Waste management	Gas og jarðgerðarstöðin	-	-	199	113	563	-	875	16%
	Grendarstöðvar	-	-	-	19	36	35	90	86%
Adaptation measures	No projects have been funded	-	-	-	-	-	-	-	0%

Table 2: Overview of the impact of each eligible project funded under RVK's Green Bond Framework and the impact ratio to funds invested from green bond issuances.

Eligible Project category	Eligible Project	2016	2017	2018	2019	2020	2021	Total avoided
Green buildings	Sundhöll Reykjavíkur	0.0	0.0	3.1	2.8	3.0	4.4	13
	Skóli	2.6	2.1	1.9	2.3	2.6	2.7	14
	Menningarmiðstöð	-	-	-	-	-	-	-
	Sundlaug Úlfarsbraut	-	-	-	-	-	-	-
	Íþróttahús	-	-	-	-	-	-	-
	Hverfastöð	-	-	-	-	3.1	3.0	6
Energy efficiency	LED götulýsing	-	2.0	2.0	15.6	15.1	21.6	56
Clean transportation	Göngu- og hjólreiðastígar	83.3	202.2	351.7	418.0	516.2	350.5	1,922
	Umhverfisvænar sorpbifreiðar	41.2	25.6	51.7	74.3	68.7	520.6	782
	Rafmagnsbifreiðar	-	1.2	4.4	5.6	12.1	18.8	42
	Hleðslustöðvar	-	-	3.3	18.4	34.4	50.7	107
Sustainable land-use	Endurheimt votlendis	-	-	-	141.3	341.4	342.4	825
	Skógrækt	-	-	-	-	-	-	-
	Græna netið	-	-	-	-	-	-	-
Waste management	Gas og jarðgerðarstöðin	-	-	-	-	2,436.4	38,830.3	41,267
	Grendarstöðvar	-	-	-	-	-	-	-
Adaptation measures	No projects have been funded	-	-	-	-	-	-	-
	Total							**45,034**

About Reykjavik

Reykjavík, a city of approximately 135,000 people, has published an extensive climate policy in which it lays out its plan to become carbon neutral by 2040 and adapt to climate change. Reykjavík has furthermore signed the Covenant of Mayors in 2011, the objective of which is to implement EU climate and energy objectives, and participates in the Compact of Mayors, an agreement to undertake transparent and supportive approach to reduce city-level GHG emissions and enhance resilience to climate change. The proceeds from the bond issuance have been used to fund projects reducing Greenhouse Gas (GHG) emissions and help the City of Reykjavik to achieve its climate objectives.

Green buildings

Dalskóli, a combined kindergarten, elementary school, and an after-school recreational centre, located in the Úlfarsárdalur area, in the eastern part of Reykjavík. In addition to providing positive social benefits in terms of access to education and essential service, the school's building is expected to achieve BREEAM 'Very Good' certification, which is underway, as required by the Green Bond Framework. The Sundhöll Reykjavíkur swimming pool has achieved BREEAM Very Good certification and is outperforming comparable swimming pools with regards to energy efficiency. The relatively modest climate change impact is a result of the low carbon intensity of energy supply for houses in Reykjavik as electricity is supplied by hydropower and geothermal power plants. A BREEAM certified very good neighbourhood workstation was added in 2021, it serves to maintain public spaces in the area. Also funded in 2021 was a swimming pool, a sports complex and a culture hall. The swimming pool and culture hall were opened in December 2021, they have not been operational for enough time to enable calculation of avoided impact. The sports complex is still under construction.

Green buildings	2016	2017	2018	2019	2020	2021	Total
				tCO2 equivalence			
Sundlaug	0.0	0.0	3.1	2.8	3.0	4.4	13.3
Hverfisstöðin Örfirisey	0.0	0.0	0.0	0.0	3.1	3.0	6.1
Dalskóli	2.6	2.1	1.9	2.3	2.6	2.7	14.1
Total	2.6	2.1	4.9	5.1	8.7	10.1	33.5

Energy efficiency

LED lighting can provide light illumination with much lower energy consumption than by other means. Compared with conventional lighting, LEDs can be up to 40-60% more energy efficient while also providing more secure lighting to Reykjavík's citizens. In 2016, Reykjavík began the preparation for replacing incandescent bulbs in its street lighting. To date, almost 10,000 light bulbs have been replaced. The relatively modest climate change impact is a result of the low carbon intensity of energy supply for lighting in Reykjavik.

Energy efficiency	2016	2017	2018	2019	2020	2021	Total
				tCO2 equivalence			
LED lighting	0.0	2.0	2.0	15.6	15.1	21.6	56.3
Total	0.0	2.0	2.0	15.6	15.1	21.6	56.3

Clean transportation

Reykjavík has a comprehensive plan to increase the share of cyclists in the city. A part of this plan is to construct and improve cycling routes. At year-end 2021, the construction of 19 km of cycling and walking paths have been financed with Green Bond proceeds.

Reykjavík has invested in biogas powered bin-lorries which avoid the use of fossil fuel when collecting waste from its residents. Charging stations for electric vehicles have been installed in various locations around Reykjavík. This infrastructure is crucial in order to minimize the population's dependence on vehicles using fossil fuel. In addition, the city has purchased electric cars to be used in its own operation.

Clean transportation	2016	2017	2018	2019	2020	2021	Total
			tCO2 equivalence				
Walking and cycling paths	83.3	202.2	351.7	418.0	516.2	350.5	1,921.8
Clean bin lorries	41.2	25.6	51.7	74.3	68.7	520.6	782.0
E-vehicles	0.0	1.2	4.4	5.6	12.1	18.8	42.0
Charging stations	0.0	0.0	3.3	18.4	34.4	50.7	106.8
Total	124.5	228.9	411.0	516.2	631.4	940.8	2,852.7

Waste management

A valuable input in the transformation from fossil fuels dependence to renewables in transportation is the use of biogas which is already being produced in Iceland. Plans are to increase the capacity of such production in a new plant in Álfsnes. This biogas plant was estimated to begin operation in 2020, where facilities will cover 12,800 m^2 and are expected to produce 3 million Nm^3 of biogas.

The plant was not fully operational for the whole of 2020 which explains the increased avoided impact in 2021. It was started up in later part of 2020 and was mostly operating in a start-up phase. However, the plant processed 2,209 tonnes of waste, which would have been landfilled resulting in production of 31,000 Nm^3 of methane gas for vehicles. The plant processed 12,340 tonnes of biological waste, resulting in 982,233 Nm^3 of biogas production. Also funded in 2021 were new neighbourhood waste containers.

Waste management	2016	2017	2018	2019	2020	2021	Total
			tCO2 equivalence				
Gas- and composting plant	0	0	0	0	2.436	38.830	41.267
Total	0	0	0	0	2.436	38.830	41.267

Sustainable land-use

Wetland reclamation is an effective way of preventing emissions of GHGs. The Icelandic government has defined wetland reclamation as one of the key actions to address climate change in order to meet the country's obligations towards the Paris Agreement.

In 2021, the City of Reykjavík ad reclaimed wetlands for a total of 30 hectares. The reduction of GHG emissions, because of this operation, will continue for the next several years. The wetland reclamation project, when completed, is estimated to reclaim wetlands of over 87 hectares. In 2021 the planting of over 15,000 trees was funded which will on average sequester about 1,500 tCO2 per year. But measurement of the growth has not been performed and thus the carbon

sequestration from trees planting is not included. Also funded in 2021 planting of plants to increase the plant life in the city.

Sustainable land-use	2016	2017	2018	2019	2020	2021	Total
				tCO2 equivalence			
Wetland reclamation	0.0	0.0	0.0	141.2	341.4	342.4	825.0
Total	0.0	0.0	0.0	141.2	341.4	342.4	825.0

Methodology

Avoided greenhouse gas emissions, detailed in this report, are emissions that would have been emitted if the projects funded by Reykjavík's green bonds would not have been initiated. Methodologies used for these impact calculations are based on relevant international guidelines and standards.[2] For the project categories 'green buildings' and 'energy efficiency', the avoided impact due to decreased electricity use is estimated based on Iceland's electricity grid carbon intensity of 10.5 gCO2e/kWh. For the category 'clean transportation', a consequential life-cycle perspective approach was used. Fossil fuel vehicles are assumed to be replaced. For the cycling infrastructure, the cyclists are counted electronically in various locations around the city. These numbers were used to estimate the frequency of cyclists using the added infrastructure. The impact of the category 'sustainable land-use' was found by estimating the impact of wetland reclamation using relevant location-relevant factors. Recent research has shown avoided emissions to be 19.5 $tCO_2e\ ha^{-1}yr^{-1}$, which was applied proportionally to these impact calculations. The impact of the gas- and composting plant was found by estimating the difference in impact between landfilling the waste processed and the production of gas to be used by vehicles and composting what remains.

KPMG's role

KPMG ehf. was appointed to calculate the positive environmental impact of Reykjavik's green bond funded operations at the year-end 2021. KPMG advised on the methodology, received necessary data from Reykjavik and calculated the financial impact. KPMG's engagement was not bound by any assurance standards nor provided an opinion.

19 April 2022

[2] International Capital Market Association's Green Bond Principles' Handbook on Harmonized Framework for Impact Reporting (December 2020)