

Landsvirkjun

Green Bond Annual Review

Introduction

In 2018 Landsvirkjun established a Green Bond Framework¹ under which the company issued a Green Bond in March the same year. The total amount issued was USD 200 million. In accordance with requirements under the Green Bond Framework, Landsvirkjun appointed CIRCULAR Solutions to conduct this Annual Review. This review details the assessment of compliance of (1) the Eligible Green Projects with the respective Eligibility Criteria, and (2) Reporting Criteria of the Framework.

Eligible Projects and Reporting Criteria

The projects funded in 2018 were evaluated based on the following criteria according to Landsvirkjun's Green Bond Framework:

1. Project Eligibility (Framework's Use of Proceeds chapter)
2. Reporting (Framework's Reporting chapter)

The Eligibility criteria of the Green Bond Framework lists three investment activities or Eligible Green Projects as detailed below:

- Geothermal: Investments in or expenditures for the acquisition, expansion, renovation, construction, development, and installation of new and existing geothermal projects with direct emissions of less than 100 g CO₂/kWh.
- Hydropower: Investments in or expenditures for the acquisition, expansion, renovation, construction, development, and installation of new and existing hydropower facilities in the capacity of no more than 100 MW and with annual emissions of less than 4 g CO₂/kWh.
- Wind: Investments in or expenditures for the acquisition, expansion, renovation, construction, development, and installation of new and existing wind power facilities.

¹ Landsvirkjun Green Bond Framework.

Two projects were funded under the Green Bond Framework in 2018, Theistareykir geothermal power plant and Búrfell II (the expansion of Búrfell hydropower plant). Both projects comply with the Eligibility Criteria as shown in Table 1.

Table 1: Eligibility criteria for use of proceeds.

	Project type	Capacity and production (MW/GWh)	Installed capacity criteria (MW)	Reported direct/annual emissions (g/kWh)	Direct/annual emissions criteria (g/kWh)
Theistareykir	Geothermal	90/653	Not defined	12.1	< 100
Búrfell II ²	Hydropower	100/363	<= 100	0	< 4

The proceeds have been fully allocated to two projects and the remaining balance at the end of 2018 is 0 USD. The proceeds from the Green Bond issuance were used to finance approximately 40% of the combined total cost of these projects. The impact of these projects, which is based on the following Impact Calculation methodology, is shown in Table 2. The reporting of projects complies with the Green Bond Framework's Reporting Criteria.

Table 2: Environmental impact of funded projects.³

	Installed electrical capacity (MW)	Electricity generated in 2018 (GWh)	Total CO ₂ e avoided (Tons)	CO ₂ e avoided in relation to the green bond (Tons)	Kg CO ₂ e emissions avoided per USD*
Project portfolio	190	1,016	212,583	90,907	0.455

* Per USD of the proceeds, USD 200 million, from Landsvirkjun's Green Bond.

Impact Calculation Methodology

Both projects supply electricity to consumers in Iceland. The consumers have been divided into two types of electricity users. Both will contribute to EU's 2030 emission reduction targets defined in the Paris Agreement but will have a different role in the EU's 2030 climate & energy framework.

No. 1: Industry operating within the European Union (EU) Emission Trading System (ETS), representing about 73% of total consumption in Iceland.⁴

² Búrfell II does not increase the size of Bjarnalón reservoir. The reservoir was created in 1969 on arid land and the size of it is 1.26 km². This results in negligible annual emissions.

³ CO₂e equivalents (CO₂e), as presented throughout this review, is a normalised factor incorporating other greenhouse gases such as CH₄ and N₂S into a single metric based on their global warming potential.

⁴ National Energy Authority of Iceland, Electricity consumption forecast 2018 - 2050, 2018.

- The benchmark emission factor for this group was calculated using a methodology from The International Financial Institutions (IFI) using the combined margin method⁵ and the IFI (Interim) Dataset of Harmonized Grid Factors V01.⁶ The grid factor data in the IFI dataset was updated with the newest (2016) country emission data as reported by the European Environment Agency.⁷
- The EU ETS benchmark emission factor is estimated to be 292 gCO₂e/kWh.

No. 2: Other Industries and households in Iceland, representing about 27% of total consumption in Iceland.⁸

- The benchmark emission factor for this group was assumed to be equivalent to the Icelandic national average from the latest National Inventory Report on greenhouse gas emissions.⁹
- The Icelandic benchmark emission factor is estimated to be 9.3 gCO₂e/kWh.

Using the above methodology, the Green Bond projects' emission benchmark is 218 gCO₂e/kWh. As shown in Table 1, the emission factor of Theistareykir is 12.1 gCO₂e/kWh and of Búrfell II 0 gCO₂e/kWh. The resulting avoided emission accredited to the bond in 2018 was found to be 90,907 tCO₂e as shown in Table 2.

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⁵ International Financial Institution; Green Bonds: Working Towards a Harmonized Framework for Impact Reporting. And, International Financial Institution; Approach to GHG Accounting for Renewable Energy Projects. 2015.

⁶ International Financial Institution; (Interim) Dataset of Harmonized Grid Factors Projects, 2016.

⁷ European Environment Agency; Overview of electricity production and use in Europe, 2018.

⁸ National Energy Authority of Iceland, Electricity consumption forecast 2018 - 2050, 2018.

⁹ The Environment Agency of Iceland; NATIONAL INVENTORY REPORT: Emissions of Greenhouse Gases in Iceland from 1990 to 2016, 2018.

Disclaimer

CIRCULAR Solutions, an independent and leading provider of green bond and sustainability consulting in Iceland conducted this review. Landsvirkjun is responsible for providing CIRCULAR Solutions with accurate documentation and information relating to the details of the projects that have been funded by its green bond, including but not limited to a description of its investment activities/Eligible Green Projects and funded projects, estimated and realized costs of the projects, and project impact. CIRCULAR Solutions actively collected and reviewed the documentation and information from Landsvirkjun to confirm its compliance with its Green Bond Framework. CIRCULAR Solutions made all efforts to ensure the highest quality and rigour during its assessment process.

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