Impact Report for Bonds and Loans

Barclays Green Issuances

SUSTAINALYTICS
a Morningstar company
IMPACT REPORTING

Impact Summary

Evaluation Date 03 July 2023

Issuer Location London, UK

Sustainalytics has calculated the estimated impact achieved by the 2020 Green Bond and Green Instruments issued between 2021 and 2022 by Barclays PLC and Barclays Bank PLC respectively. As at 31st December 2022, GBP 622 million has been allocated in the categories renewable energy, energy efficiency (buildings) and sustainable transport, with projects located in United Kingdom and India. For a representative year during the bonds' term to maturity, Sustainalytics has calculated 106,257 US tons of carbon dioxide equivalents in avoided GHG emissions.

£622M
Allocated funds

106,257
Annual emissions avoided (US tCO_2e)

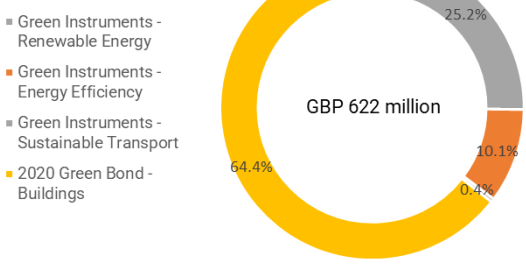
12
Projects

21K
Cars driven for one year

4
Countries

6.4M
Trees, yearly sequestration

Allocated Amount by Bond and Use of Proceeds and Project Countries



For inquiries, contact the Sustainalytics Corporate Solutions project team:

Michael Susan (Amsterdam)
Project Manager
Michael.Susan@morningstar.com

Louisa Mandt (Amsterdam)
Project Support
Louisa.Mandt@morningstar.com

Diego Gomez (London)
Client Relations
Diego.Gomez@morningstar.com

Francesca Placa (Amsterdam)
Commercialization Manager
Francesca.placa@morningstar.com

Introduction

In November 2020, Barclays PLC issued a Green Bond (the "2020 Green Bond") under the 2019 Barclays Green Bond Framework[1] to finance or refinance a portfolio of green mortgages for energy-efficient residential buildings. Throughout 2021 and 2022, Barclays Bank PLC also issued Green Structured Notes ("GSN") and European Commercial Papers ("ECP"), collectively referred to as the "Green Instruments", under the 2021 Barclays Green Issuance Framework[2] to finance or refinance renewable energy, energy efficiency and sustainable transportation projects. For clarification, "Barclays Green Issuances" herein refers to the 2020 Green Bond and the Green Instruments jointly. Barclays PLC and Barclays Bank PLC are collectively known as "Barclays" or the "Bank".

In March 2023, Barclays engaged Sustainalytics to quantify the environmental benefits of the projects funded with proceeds from the 2020 Green Bond and Green Instruments. Using established methodologies, Sustainalytics has estimated avoided emissions from Barclays' projects. This report presents the details of our findings, including a description of the methodology used to calculate the impacts. This report will be published on Barclays' website pursuant to the 2019 Green Bond Framework and 2021 Barclays Green Issuance Framework.

Barclays also engaged Sustainalytics to provide an allocation review of the allocation of proceeds and its alignment with the Barclays Green Bond Framework and the Green Issuance Framework. The allocation review is published separately.

Scope of Work and Limitations

Barclays has engaged Sustainalytics to calculate the environmental impacts of the projects financed with proceeds from the 2020 Green Bond and Green Instruments. For this work, Sustainalytics relied on the data provided by Barclays on the amount allocated and the technical data on the projects financed. This report's sole purpose is the transparent reporting of the projects' impact created and emissions avoided and does not provide endorsement of projects nor their eligibility.

Sustainalytics' impact reporting is aligned with ICMA's June 2022 Harmonised Framework for Impact Reporting handbook.[3] The methodology and assumptions made for the impact calculation are outlined in the methodology chapter.

As part of this engagement, Sustainalytics exchanged information with Barclays' management team to understand the sustainability impact of its projects. Through these exchanges, Barclays' representatives have confirmed that:

(1) They understand it is the sole responsibility of Barclays to ensure that the information provided is complete, accurate and up to date;

(2) They have provided Sustainalytics with all relevant information;

(3) Any provided material information has been duly disclosed in a timely manner.

Sustainalytics also reviewed relevant public documents and non-public information.

[1] Barclays, "Barclays Green Bond Framework", (2019), available at: https://home.barclays/content/dam/home-barclays/documents/investor-relations/fixed-income-investors/20191212-Green-Bond-Framework.pdf

2 Barclays, "Barclays Green Issuance Framework", (2021) available at https://home.barclays/content/dam/home-barclays/documents/investor-relations/debtinvestors/creditratings/20211021-Barclays-Green-Issuance-Framework-July-2021.pdf

[3] ICMA, "Handbook - Harmonised Framework for Impact Reporting" (2022), at: https://www.icmagroup.org/assets/documents/Sustainable-finance/2022-updates/Harmonised-Framework-for-Impact-Reporting-Green-Bonds_June-2022-280622.pdf

Impact Findings

For reporting, Sustainalytics follows the ICMA Harmonised Framework for Impact Reporting,[4] which synthesizes market expectations and outlines recommendations for impact reporting to create a standardized reporting structure and to enhance the understanding of the impact to all stakeholders including investors.

Table 1 below provides a summary of the impacts at the portfolio level which Sustainalytics calculated from the allocation of proceeds from Barclays' 2020 Green Bond and Green Instruments. Tables 2-3 provide details for the projects financed per use of proceeds category for the proceeds from the 2020 Green Bond and Green Instruments. These metrics correspond to a representative year during the financial instruments' term to maturity and are based on the share of project financing. Appendices 1-4 provide project-level avoided emissions.

Table 1: Summary of Impact – Barclays Green Issuances

Bond	Allocated amount	Bond tenor	Financed emissions avoided		Financed emissions avoided/GBP million	
	GBP	Years	$kgCO_2e$/year	US tCO_2e/year	$kgCO_2e$/year	US tCO_2e/year
2020 Green Bond	400,446,122	6	4,703,217	5,184	11,745	12.95
Green Instruments	221,517,119	2.5[5]	91,691,775	101,073	413,926	456.28

Table 2: Summary of Impact – 2020 Green Bond

Use of Proceeds Category	Allocated Amount	Financed emissions avoided		Financed emissions avoided/GBP million	
	GBP	$kgCO_2e$/year	US tCO_2e/year	$kgCO_2e$/year	US tCO_2e/year
Residential Mortgages	400,446,112	4,703,217	5,184	11,745	12.95

Table 3: Summary of Impact – Green Instruments

Use of Proceeds Category	Allocated Amount	Financed Annual Emissions Avoided		Financed Emissions Avoided/GBP million	
	GBP	$kgCO_2e$/year	US tCO_2e/year	$kgCO_2e$/year	US tCO_2e/year
Renewable Energy	156,606,410	91,271,052	100,609	582,805	642.43
Energy Efficiency (Buildings)	62,561,013	319,348	352	5,105	5.63
Sustainable Transport	2,349,696	101,374	112	43,144	47.56

[4] ICMA, Handbook - Harmonised Framework for Impact Reporting (2022), at: https://www.icmagroup.org/assets/documents/Sustainable-finance/2022-updates/Harmonised-Framework-for-Impact-Reporting-Green-Bonds_June-2022-280622.pdf

[5] Weighted average of bond tenor for each Green Instrument based on bond size.

Methodology

Sustainalytics developed its own methodologies for quantifying GHG avoidance and other metrics, including leveraging publicly available best-in-class methodologies, protocols and frameworks that are currently industry best practice. Our estimation practices and general principles rely on the GHG Protocol.[6] Our methodologies are based on guidance provided by the International Financial Institutions[7] on calculation methodology and global emissions. In addition, we rely on the Partnership for Carbon Accounting Financials' Global Accounting Standard[8] for guidance on estimation where data is not readily available and assumptions must be made. Finally, the UN's Clean Development Mechanism[9] provides guidance and information, serving as the foundation for these and other methodologies, including those implemented in this report.

Renewable Energy

It is assumed that energy generated by the projects crowd out a mix of current and upcoming planned generation capacity, and therefore associated emissions. The approach taken to derive the greenhouse gas emissions avoidance uses:

a) The emissions of the renewable energy projects, which is often (but not always) zero; and
b) The baseline emissions or emissions occurring in the absence of the project. For electricity generation, these emissions are based on the energy mix used to supply electricity to the local grid.
c) Financed project avoided emissions are calculated by using the share of project financing of the total project emissions avoided from the above calculations.

Data Sources and Assumptions

- For the projects included in this report, installed capacity (measured in MW) data was provided by Barclays.
- The baseline emission factors for the countries where projects are located were sourced from IFI.[10] To account for emissions from upstream activities, Sustainalytics applies an additional, indirect emissions factor.[11]
- For zero-carbon technologies such as solar and wind, the emissions per unit of generation are assumed to be 0 gCO_2e/kWh.

[6] Greenhouse Gas Protocol, About Us, at: https://ghgprotocol.org/
[7] International Financial Institutions, "Members of the International Financial Institutions on Greenhouse Gas Accounting", at: https://unfccc.int/sites/default/files/resource/IFIs membership for UNFCCC %27white pages%27_0.pdf
[8] Partnership for Carbon Accounting Financials, About, at: https://carbonaccountingfinancials.com/
[9] UNFCCC, CDM Methodology Booklet, (2021), at: https://cdm.unfccc.int/methodologies/documentation/index.html
[10] UNFCCC, The IFI Dataset of Default Grid Factors (2016), available at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Funfccc.int%2Fsites%2Fdefault%2Ffiles%2Fresource%2FHarmonized_IFI_Default_Grid_Factors_2021_v3.2_0.xlsx&wdOrigin=BROWSELINK
[11] Government of the UK, Department for Business, Energy & Industrial strategy, "Government conversion factors for company reporting of greenhouse gas emissions", at: https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting

Energy Efficiency (Buildings)

It is assumed that new buildings consume less energy than a mix of existing buildings and new construction. The avoidance of greenhouse gas emissions is calculated using:

a) The emissions of the energy efficient building projects. To the extent available, the reporting is based on metered energy consumption. If such information is not available, estimates for the relevant projects are based on the building certificates, standards or country-level averages.
b) The baseline emissions, or emissions occurring in the absence of the projects. This figure is based on the estimated energy intensity of comparable buildings, or in the case of refurbishments, the prior emissions.
c) Financed project avoided emissions are calculated by using the share of project financing of the total project emissions avoided from the above calculations.

Data Sources and Assumptions

- For the projects included in this report, building data including gross building area, location, emission intensities and relevant building certificates were provided by Barclays and used as inputs for the calculations. Where relevant, Sustainalytics has performed calculations based on the most recently available green building certificates or energy performance certificates for each property.
- Where relevant, Sustainalytics modelled the energy intensity for buildings based on a representative sample of EPC certifications and grades of the respective buildings.
- Based on location and building characteristics such as type and size, the energy intensity of a baseline building is estimated using a combination of country averages and publicly available statistical models.[12]
- The emissions factors for the baseline properties are based on the average energy mix for buildings in the relevant country. A distinction is made between electricity consumption and other energy consumption.
- The grid emissions factors for the countries in which the projects are located were sourced from IFI.[10] To account for emissions from upstream activities, Sustainalytics applies an additional, indirect emissions factor.[13]

[12] IFC's EDGE model is used for statistical modelling of buildings.
[13] Government of the UK, Department for Business, Energy & Industrial strategy, "Government conversion factors for company reporting of greenhouse gas emissions", at: https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting

Sustainable Transport

Sustainable transport is assumed to displace a mix of existing and future transportation along the same travel distance. The carbon avoidance is calculated using:

a) The emissions of the sustainable transport projects based on the best available data from Barclays. To the extent available, calculations are based on fuel consumption or passenger-kilometre data. In the absence of such information, estimates are made based on mode of transportation, fuel type and average passengers per vehicle.
b) The baseline emissions, which are the emissions associated with a basket of vehicles or modes of transport being replaced currently and in the future lifetime of the project.
c) Financed project avoided emissions are calculated by using the share of project financing of the total project emissions avoided from above calculations.

Data Sources and Assumptions

- For the projects included in this report, data on the vehicle type and number of vehicles was provided by Barclays.
- It is assumed that the financed vehicles displace vehicles in the same car classification category consuming the average fuel type used in the UK.[14]
- Project level emissions associated with electricity consumption were calculated using a national grid emission factor sourced from IFI.[10] To account for emissions from upstream activities, such as electricity transmission losses and the extraction and refining of primary fuels, Sustainalytics applies an additional, indirect emissions factor to the emissions directly emitted by the project and baseline vehicles.[15]

[14] Based on the current mix of fuels of cars on the road in the UK.
Government of the UK, Department for Transport and the Driver and Vehicle Licensing Agency (2022), at:
https://www.gov.uk/government/statistical-data-sets/vehicle-licensing-statistics-data-tables
[15] Government of the UK, Department for Business, Energy & Industrial strategy, "Government conversion factors for company reporting of greenhouse gas emissions", at: https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting

Appendix 1: 2020 Green Bond – project level impact of buildings by building type

Building type	Number of loans	Gross building area	Allocated amount	Share of total project financing	Average energy intensity	Average energy reduction	Financed direct emissions[16]	Financed indirect emissions[17]	Financed emissions avoided[18]		Financed emissions avoided/GBP million	
		m^2	GBP		kWh/m^2		$kgCO_2e$/year	$kgCO_2e$/year	$kgCO_2e$/year	US tCO_2e/year	$kgCO_2e$/year	US tCO_2e/year
House	1,730	171,927	377,905,637	100%	70	61%	2,701,256	379,564	4,447,835	4,903	11,770	12.97
Flat	113	7,334	22,219,481	100%	60	70%	70,603	12,938	248,670	274	11,192	12.34
Bungalow	2	107	271,216	100%	92	64%	2,029	372	4,199	5	15,482	17.07
Maisonette	1	114	49,789	100%	58	61%	1,367	251	2,513	3	50,478	55.64

[16] Direct Emissions are the emissions from the energy consumed directly on the premises.
[17] Indirect Emissions are the emissions resulting from the extraction, refining and transportation of primary fuels, including transmission and distribution losses, before their use in the generation of electricity.
[18] Due to rounding, the project level avoidance might not sum up to the total avoidance in the appendices.

Appendix 2: Green instruments – project level impact of renewable energy projects

Project name	Project type	Country	Allocated amount	Share of total project financing	Project generation	Financed generation	Project capacity	Financed capacity	Financed emissions avoided		Financed emissions avoided/GBP million	
			GBP		MWh	MWh	MW	MW	$kgCO_2e$/year	US tCO_2e/year	$kgCO_2e$/year	US tCO_2e/year
Project 1	Solar (photovoltaic)	India	2,060,461	0.15%	989,448	1,484	910	1	3,219,347	3,549	1,562,440	1,722
	Wind (onshore)	India			1,099,689	1,650	762	1				
Project 2	Wind (offshore)	UK	31,394,768	1.23%	3,827,592	47,079	1,200	15	17,427,635	19,211	545,726	602
Project 3	Wind (offshore)	UK	23,780,467	0.85%	3,827,592	32,535	1,200	10	12,043,488	13,276	506,445	558
Project 4	Wind (offshore)	UK	7,328,960	0.25%	3,827,592	9,569	1,200	3	3,542,202	3,905	483,316	533
Project 5	Wind (offshore)	UK	38,829,709	2.75%	3,636,213	99,996	1,140	31	37,016,014	40,803	966,735	1,066
Project 6	Wind (offshore)	UK	23,275,888	1.02%	1,428,968	14,575	448	5	5,395,483	5,947	231,806	256
Project 7	Solar (photovoltaic)	UK	19,945,150	4.12%	509,114	20,976	566	23	7,764,621	8,559	389,299	429
Project 8	Wind (offshore)	UK	9,991,007	2.90%	452,932	13,135	142	4	4,862,263	5,360	486,664	536

Appendix 3: Green Instruments – project level impact of buildings

Project name	Number of units	Gross building area	Allocated amount	Share of total project financing	Energy intensity	Energy reduction	Direct emissions [19]	Indirect emissions [20]	Financed emissions avoided		Financed emissions avoided/GBP million	
		m^2	GBP		kWh/m^2		$kgCO_2e$/year	$kgCO_2e$/year	$kgCO_2e$/year	US tCO_2e/year	$kgCO_2e$/year	US tCO_2e/year
Project 1	360	19,407	16,447,019	59%	91	44%	226,587	52,332	170,379	188	10,359	11.42
Project 2	637	49,584	46,113,994	15%	48	64%	72,291	13,247	148,969	164	3,230	3.56

[19] Direct Emissions are the emissions from the energy consumed directly on the premises.
[20] Indirect Emissions are the emissions resulting from the extraction, refining and transportation of primary fuels, including transmission and distribution losses, before their use in the generation of electricity.

Appendix 4: Green Instruments – project level impact of sustainable transportation projects by car model

Car model	Country	Allocated amount	Share of total project financing	Number of vehicles	Vehicle-kilometres travelled	Direct emissions	Indirect emissions	Financed emissions avoided		Financed emissions avoided/GBP million	
		GBP			vkm	$kgCO_2e$/year	$kgCO_2e$/year	$kgCO_2e$/year	US tCO_2e/year	$kgCO_2e$/year	US tCO_2e/year
Model 1	UK	42,005	59%	3	30,911	1,061	245	2,349	3	55,925	61.65
Model 2	UK	451,791	59%	19	195,772	7,418	1,713	17,598	19	38,952	42.94
Model 3	UK	171,286	59%	9	92,734	3,252	751	8,243	9	48,125	53.05
Model 4	UK	26,626	59%	2	20,608	678	157	1,587	2	59,610	65.71
Model 5	UK	44,363	59%	2	20,608	777	179	1,793	2	40,410	44.54
Model 6	UK	124,102	59%	5	51,519	2,124	490	4,351	5	35,061	38.65
Model 7	UK	301,734	59%	11	113,342	5,513	1,273	11,360	13	37,650	41.50
Model 8	UK	241,333	59%	9	92,734	4,459	1,030	11,681	13	48,400	53.35
Model 9	UK	26,971	59%	2	20,608	527	122	1,696	2	62,877	69.31
Model 10	UK	29,753	59%	1	10,304	419	97	874	1	29,390	32.40
Model 11	UK	69,203	59%	2	20,608	901	208	1,703	2	24,616	27.13
Model 12	UK	74,147	59%	3	30,911	1,135	262	2,711	3	36,562	40.30
Model 13	UK	278,584	59%	5	51,519	2,367	547	6,105	7	21,915	24.16
Model 14	UK	21,459	59%	2	20,608	730	169	1,550	2	72,225	79.61
Model 15	UK	23,829	59%	2	20,608	694	160	1,575	2	66,114	72.88
Model 16	UK	10,071	59%	1	10,304	403	93	747	1	74,210	81.80
Model 17	UK	10,795	59%	1	10,304	419	97	736	1	68,181	75.16
Model 18	UK	20,872	59%	3	30,911	1,207	279	2,659	3	127,397	140.43
Model 19	UK	13,165	59%	1	10,304	315	73	679	1	51,549	56.82
Model 20	UK	8,689	59%	1	10,304	331	76	938	1	107,919	118.96
Model 21	UK	13,473	59%	1	10,304	345	80	790	1	58,602	64.60
Model 22	UK	134,039	59%	8	82,430	2,876	664	7,338	8	54,744	60.34
Model 23	UK	19,359	59%	2	20,608	649	150	1,344	1	69,441	76.55
Model 24	UK	29,481	59%	3	30,911	1,135	262	2,711	3	91,955	101.36
Model 25	UK	78,043	59%	3	30,911	1,345	311	3,451	4	44,224	48.75
Model 26	UK	11,269	59%	1	10,304	712	164	853	1	75,689	83.43
Model 27	UK	8,057	59%	1	10,304	372	86	638	1	79,197	87.30
Model 28	UK	65,189	59%	2	20,608	1,058	244	3,313	4	50,821	56.02

Disclaimer

Sustainalytics has also been engaged to deliver a CBI Post-Issuance report, which has been prepared by a distinct, separate team.

About Sustainalytics, a Morningstar Company

Sustainalytics, a Morningstar Company, is a leading ESG research, ratings and data firm that supports investors around the world with the development and implementation of responsible investment strategies. For more than 30 years, the firm has been at the forefront of developing high-quality, innovative solutions to meet the evolving needs of global investors. Today, Sustainalytics works with hundreds of the world's leading asset managers and pension funds who incorporate ESG and corporate governance information and assessments into their investment processes. Sustainalytics also works with hundreds of companies and their financial intermediaries to help them consider sustainability in policies, practices and capital projects. With 17 offices globally, Sustainalytics has more than 1500 staff members, including more than 500 analysts with varied multidisciplinary expertise across more than 40 industry groups.

For more information, visit www.sustainalytics.com

Or contact us contact@sustainalytics.com