Barclays Green Bond Investor Report

February 2018

Introduction

Green Finance experienced a transformational year in 2017. Recognition of the commercial, reputational and regulatory implications of climate change are shaping the way businesses engage with the Green Agenda. Barclays has been at the forefront of this movement, ensuring our clients have access to innovative financing that places Green principles at its core. Barclays launched its inaugural Green Bond in November 2017 – this made Barclays the first bank to issue a Green Bond backed solely by UK assets.

This was followed in December 2017 by the launch of an innovative suite of Corporate Green Finance products, including the first-to-market Green Deposit, Green Loan, Green Asset finance and Green Innovation Finance, all developed using 'Barclays Green Product Framework' in collaboration with global green research and ratings leader, Sustainalytics. More market-leading green products are in development and due to be launched throughout 2018.

"Barclays, like so many of our clients, recognises that addressing environmental challenges is not only a necessity but a compelling economic opportunity. We already have an established presence in the green bond market as a successful lead arranger, investor and now issuer so we are delighted to be able to build on our expertise by launching new, innovative green products to help meet the booming demand for green finance from a broader cross-section of our clients. We're excited to be at the forefront of something so game-changing."
Rhian-Mari Thomas, Chair, Barclays Green Banking Council.

This report is Barclays' first annual Green Bond investor report. The report contains details of the allocated portfolio of Eligible Mortgage Assets, as well as a quantitative environmental impact assessment for our inaugural issuance.

Green Bond Framework Summary

Section	Summary
Use of Proceeds	• Allocate an equivalent amount of funding which represents the proceeds from Barclays Green Bonds to finance and refinance mortgages on energy efficient residential mortgages that are in the top 15% of lowest carbon intensive properties based on EPC data. • A formula was derived taking into account the current performance of households, the UK government's linear target of 'close to zero' emissions by 2050 and the mid-point of a potential green bond maturity needing to coincide with the top 15% of lowest carbon intensive properties, resulting in the following formula for the maximum carbon intensity output: $$y = -0.8235x + 1688.24$$ Where x = year of mid-point bond maturity and y = carbon intensity, measured in $kgCO_2/m^2/year$
Process Evaluation and Selection	• The residential mortgage portfolio will be mapped against the latest EPC data and filtered, removing any mortgages that are already used as collateral in other transactions and ensuring they are in the top 15% of the lowest carbon intensive properties
Management of Proceeds	• The size of the allocated portfolio of Eligible Mortgage Assets (EMAs) will be monitored on a monthly basis • Any redeemed or ineligible assets will be replaced by EMAs
Reporting	• Barclays will publish an annual investor report • A suitably qualified provider will provide an assurance report each year.

Green Bond Details

Issuer	Barclays PLC
Settlement Date	14/11/2017
Currency	Euro
Notional	500,000,000
Tenor	6-year noncall 5-year
ISIN	XS1716820029
Call Date	14/11/2022
Maturity Date	14/11/2023

## Carbon Intensity of Eligible Mortgage Asset Portfolio (kgCO$_2$/m^2/year)

- 1 1-9.99 (12%)
- 2 10-19.99 (60%)
- 3 20-24.8 (28%)

All EMA properties in the allocated portfolio have an estimated 24.8 kgCO$_2$/m^2/year or less.

Use of Proceeds

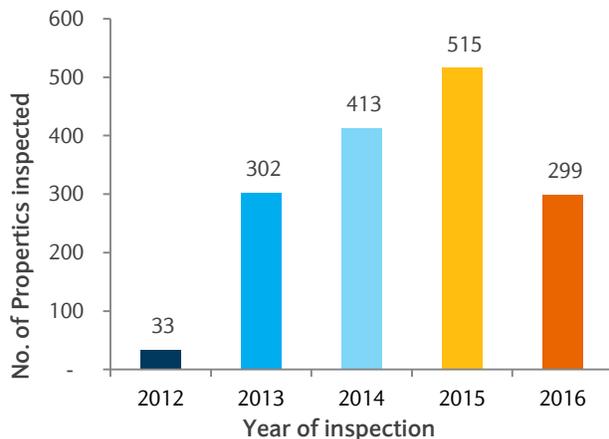|	
Reporting Date	31/12/2017
GBP equivalent of Issuance Proceeds	£440,772,785
FX rate as at pricing date (6/11/2017)	1.1345 EUR/GBP
Size of Allocated Eligible Mortgage Assets	£442,284,380
Bond Proceeds allocated	100%
Carbon Intensity max threshold	24.8 kgCO$_2$/m^2/year[1]
Finance/Refinance	100% Refinance

Seasoning of Loans
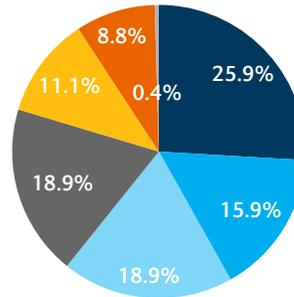
Months
- 0-6
- 6-12
- 12-18
- 18-24
- 24-30
- 30-36
- 36+

25.9%, 0.4%, 15.9%, 18.9%, 18.9%, 11.1%, 8.8%

All loans in the portfolio have been originated within 3 years of the settlement date

Year of EPC Inspection

No. of Properties inspected vs Year of inspection

Year	Count
2012	33
2013	302
2014	413
2015	515
2016	299

Geographical Distribution of EMAs

East Anglia	9.16%
East Midlands	4.35%
Greater London	25.74%
North	1.92%
North West	4.48%
South East	36.94%
South West	7.04%
Wales	1.73%
West Midlands	4.93%
Yorks and Humberside	3.71%

Over 50% of all EMA properties have had their most recent EPC inspection from 2015 onwards.

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[1] This has been calculated in accordance with formula $y = -0.8235x + 1688.24$ where $x = 2020$

Barclays Green Bond Quantitative Environmental Impact Assessment

Carbon Reporting as at 31st December 2017: Results and Methodology

As at 31st December 2017, Barclays' allocated Eligible Mortgage Asset portfolio contained 1,562 mortgage loans for residential properties with a nominal value of £442,284,379.81[2]. This report shows our results and methodology for estimating potential avoided carbon emissions (versus national EPC average) for these properties.

	Nominal Value (£m)	Number of Properties
Proceeds allocated to Buy-to-Let mortgages	£172,161,206	697
Proceeds allocated to Residential mortgages	£270,123,173	865
EMA portfolio Assets as at 31st December 2017	**£442,284,379**	**1,562**

The calculations have been checked and verified by Carbon Trust as part of their CBI Post Issuance Verification Report dated 20th February 2018[3]. All calculations are based on loan data as of 31st December 2017 and on the most recent EPC dataset release for England and Wales (March 2017).

1. Comparison of average estimated carbon intensity against a domestic baseline

This first calculation compares the average estimated carbon intensity of the allocated portfolio of Eligible Mortgage Assets against a comparable domestic baseline. The comparable baseline used in this report is the average estimated carbon intensity of all properties in the most recent EPC dataset[4] as at March 2017, which has been used as a projection for the national average of carbon intensity for properties in England and Wales.

The EPC dataset contains duplicate addresses, due to single properties having multiple EPC certificates recorded over time. These duplicate entries were not considered in order to mitigate ambiguity regarding the appropriate EPC record to associate with the properties. EPC information marked as 'Invalid' on the dataset has also been removed from our internal database, as these

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[2] Equivalent to €501,771,628.99 using FX rate at pricing date

[3] Carbon Trust Assurance Report has been published on the 'Green Bonds' section of Barclays Investor Relations website (https://www.home.barclays/barclays-investor-relations/treasury-and-capital/green-bonds.html)

[4] The appropriate field within the EPC dataset that contains estimated carbon intensity figures for each property is: CO_2 EMISS CURR PER FLOOR AREA (CO_2 emissions per square metre floor area per year in kg/m^2)

contain potentially erroneous values for carbon intensity. Finally, the estimated avoided carbon emissions (versus national EPC average) are sensitive to the choice of baseline dataset. For example, the avoided carbon emissions versus the national EPC average may decrease over time as UK housing energy efficiency improves. The DCLG[5] EPC data release contains EPC records for c.16 million properties in England and Wales as at March 2017, whilst the total number of domestic properties in England and Wales is much higher (25.4m domestic properties with a Council Tax (CT) band as at 31 March 2017). As a result, this report only considers the national average carbon intensity based on EPC data, and subsequent calculations are benchmarked against this average.

<u>Allocated Portfolio of Eligible Mortgage Assets</u>

Total $KgCO_2/m^2$ of all Eligible Mortgage Assets = 24,976.6

Total number of properties = 1,562

$$Average = \frac{24,976.6}{1,562} = \textbf{15.99 KgCO}_2\textbf{/m}^2$$

<u>EPC Dataset (March 2017)</u>

Total $KgCO_2/m^2$ of all properties = 623,075,041.3

Total number of properties = 15,423,226

$$Average = \frac{623,075,041.3}{15,423,226} = \textbf{40.40 KgCO}_2\textbf{/m}^2$$

The average carbon intensity for Barclays' allocated Eligible Mortgage Asset portfolio of 15.99 $KgCO_2/m^2$ is c.60% lower than the EPC dataset average of 40.40 $KgCO_2/m^2$, and c.35% lower than the top 15% of lowest carbon intensive properties at 24.8 $KgCO_2/m^2$.

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[5] Department for Communities and Local Government

2. Annual estimated KgCO$_2$ avoidance of Allocated Eligible Mortgage Asset portfolio

The second calculation estimates the annual carbon emission avoidance of the overall portfolio of Eligible Mortgage Assets. This calculation includes the following inputs:

(a) Average estimated carbon intensity of allocated Eligible Mortgage Asset portfolio (in KgCO$_2$/m^2)
(b) Average estimated carbon intensity of EPC dataset (in KgCO$_2$/m^2)
(c) Total floor area of EMA portfolio properties (in m^2)

The formula for calculating the estimated carbon avoidance using these inputs is shown below: -

$$\text{Annual KgCO}_2 = (a - b) * (c)$$

Where:

a = 15.99

b = 40.40

c = 184,978

Estimated Annual Avoidance versus national EPC average = 4,515,313 KgCO$_2$ or 4977.23 US tCO$_2$[6]

3. Estimated carbon emissions avoided per every €1m of proceeds allocated

The third calculation is an estimation of how many tons of CO$_2$ have been avoided per €1m of Barclays Green Bond proceeds allocated. The formula for this calculation is shown below:

$$\text{CO}_2 \text{ Avoidance per €1m invested} = \frac{(a * b)}{c}$$

Where:

a = €1,000,000

b = 4977.23 US tCO$_2$

c = €500,000,000

Annual CO$_2$ Avoidance per €1m invested versus national EPC average = 9.95 US tCO$_2$

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[6] Conversion: $Kg = \frac{US\ t}{0.0011023}$

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