



Barclays Green Bond Framework Investor Presentation

September 2017



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Introduction to Green Bond Framework

Barclays is an active participant in the Green Bond market:

- Investment from Barclays Treasury: Our initial £1bn investment target was reached in 2015, ahead of COP21¹ and has now been upsized to £2bn. This investment forms part of our liquid asset buffer.
- Debt Capital Markets: Barclays Investment Bank has helped clients issue more than £17.6bn of Green and ESG Bonds since 2016².
- Market support: Barclays is a signatory to the Green Bond Principles and is a partner of the Climate Bonds Initiative (CBI).
- The release of a Green Bond Framework for a Barclays issuance is a natural step to further our role in the sector.

Barclays approach to designing our Green Bond Framework:

- Focus on residential mortgages in England and Wales:
 - Barclays has significant presence in the UK residential mortgage market (£129bn of outstanding mortgages as of Dec 2016) and this sector is a substantial contributor to the UK carbon footprint (29% of total emissions in 2015³).
 - The public release of the Energy Performance Certificate (EPC) data for England and Wales by the Department for Communities and Local Government in March 2017 has enabled us to map this data against properties in our mortgage book.
- Use of proceeds: our framework is designed for senior unsecured debt to be issued from Barclays PLC with specific “use of proceeds”, which is consistent with our current funding strategy (MREL requirements) and with recent Green Bond market practice.
- Labelling: our framework benefits from a second party opinion from the Carbon Trust confirming that it meets the ICMA Green Bond Principles and any issuance under this framework is intended to be certified by the Climate Bonds Initiative.

Sustainability at Barclays

- Beyond the publication of this framework, our newly formed Green Banking Council supports Barclays continued advocacy effort and the development of our Green Product pipeline. Several new products have been launched in 2017.
- Our Green Bond Framework may be expanded in the future to include home improvements, other asset classes and products.

¹ <http://www.cop21paris.org> | ² Bloomberg | ³ Energy Consumption in the UK (ECUK) 2017, National Statistics, Department for Business, Energy & Industrial Strategy

Green Bond Framework

Barclays Green Bond Framework: Summary

Barclays Green Bond Framework

Barclays has designed a robust framework and aims to provide a clear demonstration of our broader commitment in managing environmental risks associated with lending.

Certification & Assurance

Second Party opinion by the Carbon Trust confirming compliance of the framework with ICMA's 2017 Green Bond Principles. Independent suitably qualified assurance provider to be appointed for annual verification testing. Barclays also intends to obtain Climate Bond Initiative (CBI) certification for each issuance.

Use of Proceeds: Eligible Mortgage Assets

Mortgages in the top 15% of the lowest carbon intensive residential properties in England and Wales. Barclays will use Energy Performance Certificate (EPC) data to determine eligibility, as released by the Department for Communities and Local Government (DCLG).

Energy Performance Certificates

EPCs were introduced in England and Wales in 2007 following the European Union Directive 2002/91/EC. In March 2017, the DCLG released approximately 16m records relating to all EPCs recorded to the end of December 2016.

Barclays will use the carbon intensity reported in EPCs to determine the top 15% of the lowest carbon intensive residential properties, which measures the estimated carbon emission of a property per unit floor area per year, $\text{kgCO}_2/\text{m}^2/\text{year}$.

Issuer

Green bonds issued under this framework will be senior unsecured liabilities issued from Barclays PLC. Barclays PLC will then allocate an equivalent amount of the issuance proceeds to Barclays UK (or its successor) to provide funding for Eligible Mortgage Assets (EMAs).

Ongoing Reporting

An annual investor report will be publically available in line with annual results.

Energy Performance Certificates in England and Wales

“Energy Performance Certificates (EPCs) are recognised as the best existing, widely available data source for comparing residential building energy performance in England and Wales.”

The Carbon Trust¹

Who produces an EPC?

EPCs are produced by a Domestic Energy Assessor (DEA) who use the Standard Assessment Procedure (SAP) which is derived from the UK Building Research Establishment’s Domestic Energy Model (BREDEM). In the case of refurbished or retrofitted buildings the Reduced Data Standard Assessment Procedure (RdSAP) is utilised.

What is examined during an EPC assessment?

A DEA examines a large number of items in a building including windows, loft insulation, and heating system. The full list of measurement areas can be found on the *Energy Performance of Building Data: England and Wales* website.

Outputs from an EPC assessment

The EPC data contains a number of energy efficiency metrics including:

Energy Efficiency Rating

Based on costs associated with heating and revenues from any generation technologies. The software creates a score from 1 to 100 (least to most efficient). The value is translated into a scale ranging from A to G (most to least efficient).

Environmental Impact Rating

Based on CO₂ emissions associated with fuel consumption, a score and grade is assigned based on the same metrics as Energy Efficiency Rating.

Carbon Intensity

Calculated from CO₂ emissions associated with building energy end-use per unit floor area. Measured in kgCO₂/m²/year.

EPC data release

In March 2017 the Department for Communities and Local Government released data relating to all EPCs reported until December 2016, comprising approximately 16 million records.

¹ Carbon Trust Feasibility Study |

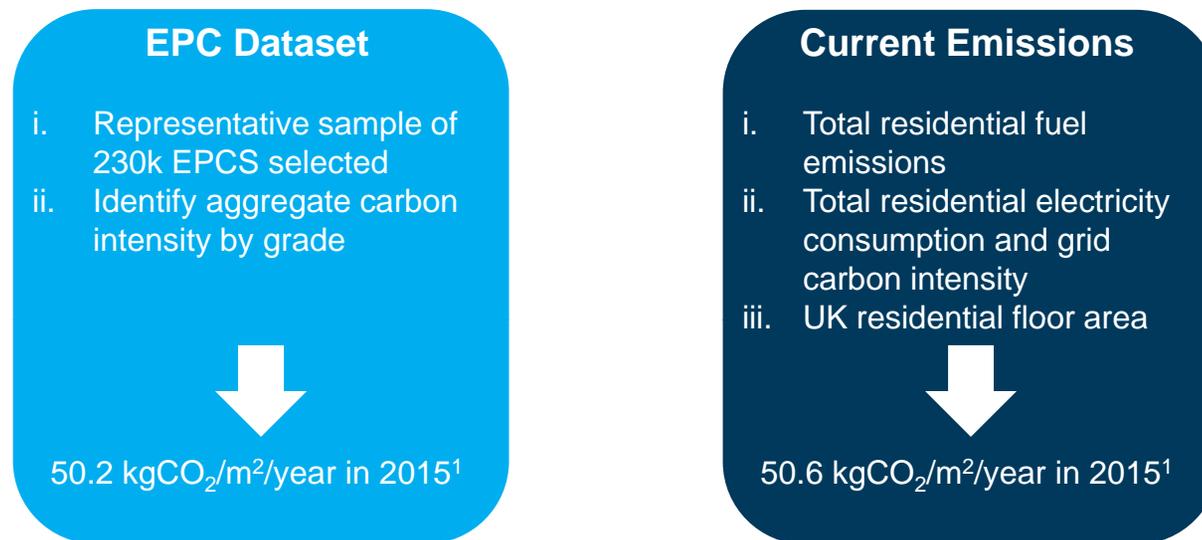
Energy Performance Certificates in England and Wales

The carbon intensity threshold

The Carbon Trust analysed the full EPC database to determine the current threshold that represents the top 15% of the lowest carbon intensive properties. The top 15% carbon intensity threshold for properties in the EPC were found to be equivalent to a estimated performance of $28\text{kgCO}_2/\text{m}^2/\text{year}^1$, based on the March 2017 Department for Local Communities and Local Government data release.

Are EPCs aligned with current emissions?

EPCs are non-invasive assessments and are therefore only an estimate. However, the carbon intensity implied by the EPC dataset and current figures for residential emissions are broadly aligned, as seen below, based on the fuel and electricity consumption figures from the Committee on Climate Change (CCC). This indicates EPCs as a whole are representative of CCC residential sector emissions and the carbon intensity threshold is applicable to the entire UK housing stock.



¹ Carbon Trust Feasibility Study |

Carbon Intensity Threshold Formula

Carbon Intensity Threshold Formula

- Formula which estimates the maximum carbon intensity for a Barclays Green Bond from the March 2017 data release:

$$y = -0.8235x + 1688.24,$$

where x = year of mid – point bond maturity and

y = carbon intensity, kg/CO₂/m²/year ^{1, 2}

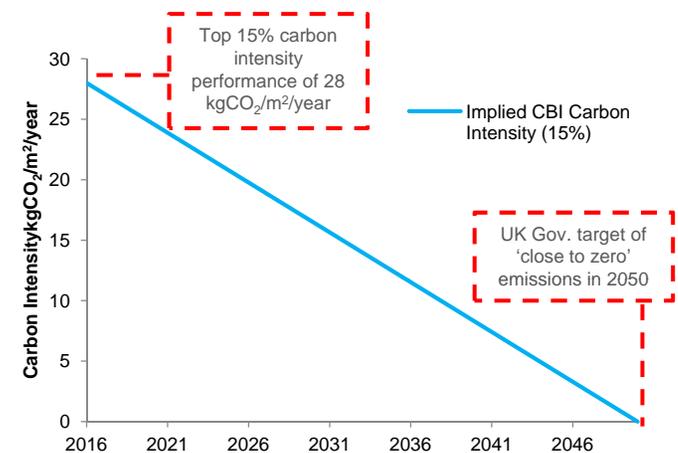
How the formula is derived?

The formula is derived by taking into account the following factors:

- Properties need to meet the top 15% carbon intensity threshold in their local market to comply with the CBI's Climate Bonds Standards.
- Analysis by the Carbon Trust shows that the top 15% carbon intensity threshold for properties within the March 2017 EPC dataset is equivalent to a carbon intensity performance of 28 kgCO₂/m²/year and below.
- In addition, the UK government has a linear target of 'close to zero' emissions by 2050. Therefore a linear trajectory can be drawn to zero emissions in 2050 which can be seen on the graph to the right.
- Using a mid-point for maturity, allows on average, properties to be in the top 15% for the duration of issuance.
- The carbon intensity threshold will be fixed for the term of the issuance.

Example

A Barclays 10yr Green Bond issued in 2017 will have a mid-point in 2022. This equates to a maximum carbon intensity of 23.1 kgCO₂/m²/year for a property in England or Wales to feature in the highest performing 15%. Therefore, all properties that are financed or refinanced using an equivalent amount of issuance proceeds of a Green Bond are required to have a carbon intensity of less than or equal to 23.1 kgCO₂/m²/year.



¹ CBI reserves the right to review this formula | ² The calculation of the top 15% is a point in time assessment and may change from the formula in the framework |

Second Opinion & Climate Bond Certification

Second Opinion & Climate Bond Certification



Barclays has obtained a **Second Party Opinion from The Carbon Trust** that confirms the Barclays Green Bond Framework conforms with the ICMA Green Bond Principles.



Barclays intends to obtain **Climate Bond certification from the Climate Bonds Initiative (CBI)** for each issuance confirming that Eligible Mortgage Assets are selected based on the independent Climate Bond Standards.

Energy Performance Certificated for Residential Property Green Bonds – A Feasibility Study by The Carbon Trust¹

- The Carbon Trust undertook a feasibility study, which presented results based on an impartial analysis of primary and secondary literary resources, interviews with sector experts and a decarbonisation model for residential buildings in the UK.
- “Energy Performance Certificates are recognized as the best existing, widely available data source for comparing residential building energy performance in England and Wales.”
- “Carbon intensity ($\text{kgCO}_2/\text{m}^2/\text{year}$) is the best metric for identifying the top 15% performing properties...”
- “... analysis of the current EPC database indicated that $28\text{kgCO}_2/\text{m}^2/\text{year}$ represents the top 15% of EPCs issued through 2016.”

¹ Carbon Trust Feasibility Study |

Barclays Green Bond Framework

The launch of Barclays Green Bond Framework supports our approach to Green Finance and will enable Barclays to finance and refinance projects that facilitate the transition of our customers and clients to a sustainable and low carbon global economy.

Given Barclays' significant presence in the UK residential mortgage market, a Barclays Green Bond issued under the Green Bond Framework is a clear demonstration of our broader commitment in managing the environmental risks associated with lending.

2. Process of evaluation and selection

Barclays residential mortgage portfolio will be mapped against the latest EPC data and filtered to ensure mortgages are not encumbered and are in the top 15% of the lowest carbon intensive properties

4. Reporting

Barclays will publish an annual investor report. A suitably qualified assurance provider will also perform and report on verification testing

1. 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

3. Management of proceeds

Size of the allocated portfolio of Eligible Mortgage Assets (EMAs) will be monitored on a monthly basis, whilst redeemed or ineligible mortgages will be replaced by other EMAs



1. Use of Proceeds

Use of Proceeds

An amount of funding which represents the proceeds from Barclays Green Bonds will be allocated by Barclays to the financing and refinancing of energy efficient residential properties in England and Wales based on EPC data.

Eligible Mortgage Assets

1. Residential mortgages originated within the last 3 years prior to the date of issuance.
2. The top 15% of the lowest carbon intensive properties.
3. Mortgages are not used by Barclays as collateral in any transaction.

EPC Data Set

In March 2017, the DCLG released data relating to all EPCs recorded to the end of December 2016, approximately 16m records. This comprehensive data set has allowed Barclays to identify and map EPC data against properties in Barclays' residential mortgage portfolio.

Allocation from Barclays PLC

Barclays Green bonds issued under this framework will be senior unsecured liabilities issued by Barclays PLC. Barclays PLC will allocate an equivalent amount of the Barclays Green Bond proceeds to Barclays UK (or its successor) to fund EMAs in accordance with the eligibility criteria.

Principle advantages of the Carbon Intensity metric

- Measures the estimated carbon emissions per unit floor area ($\text{kgCO}_2/\text{m}^2/\text{year}$)
- Standardised method of measuring a building's estimated carbon footprint
- Independent of potential changes to the EPC Energy Efficiency rating methodology of a property



2. Process of Evaluation and Selection

Mortgage Origination

Barclays residential mortgages are originated in line with existing Barclays credit risk policies.

EPC Mapping

Barclays residential mortgages will be cross-matched on an annual basis against the latest EPC release (or relevant successor) to determine eligibility.

Verification Testing

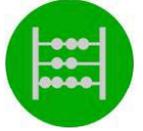
A suitably qualified assurance provider will perform verification testing on an annual basis before the reporting date to check the viability of Barclays' cross-match process and asset selection criteria.

Verification Report

Report will be published annually alongside the Barclays annual investor report.

EMA mapping process

- Map the property name and/or number, street name and postcode of Barclays mortgages against the latest EPC data release to determine eligibility.
- Additional filtering will be undertaken to take into account target carbon intensity levels and encumbrance.



3. Management of Proceeds

Proceeds Allocation

The intention is for the allocated portfolio of Eligible Mortgage Assets to be at least equal to the sterling equivalent net proceeds of the Barclays Green Bond at issuance.

Portfolio Monitoring

Barclays will monitor the size of the allocated portfolio of Eligible Mortgage Assets on a monthly basis.

Eligibility Maintenance

Mortgages that have redeemed or repaid, or where the EPC is no longer valid or fails to qualify against the top 15% carbon intensity threshold set at issuance, will be replaced with other EMAs.

Shortfall

If at the end of the month there is a shortfall between the allocated portfolio of EMAs and the Barclays Green Bond issuance proceeds, Barclays will invest an amount equivalent to that shortfall in a Barclays group liquidity pool (the Liquidity Pool).

Overview of Barclays liquidity pool

- Comprised of assets held in temporary investment instruments that are cash, or cash equivalent instruments, within our Treasury function.



4. Reporting

Investor Report

Barclays PLC will publish an investor report annually in line with Barclays PLC annual results

Among other items the investor report will contain:

- Size of the outstanding issuance and the equivalent allocated portfolio of EMAs
- High level stratification tables
- Balance of equivalent net unallocated issuance proceeds (if any) and categories of investments made in the Liquidity Pool
- A quantitative environmental impact assessment

What reporting is associated with each Barclays Green Bond issuance?¹

1. Investor Report (annually)
2. Verification testing by suitable qualified assurance provider (annually)
3. Third party certification by CBI (pre-issuance)
4. Second party opinion by The Carbon Trust (against Framework)

¹ Barclays Green Bond annual reports and associated assurance will be available on the Barclays Investor Relations website |

Sustainability at Barclays

Barclays Shared Growth Ambition

Our long-term aim is to create and grow a collection of products, services and partnerships that improve the lives of people in the communities which we serve, whilst providing the commercial return our shareholders deserve.

Access to Financing

This helps to fund crucial social and environmental infrastructure, while giving us opportunities in growing markets

Access to Financial and Digital Empowerment

Access to Employment

Barclays acknowledges climate change and recognises the significant funding requirement needed to limit global warming to 2°C...

\$90 tn

in infrastructure investments is required to keep within a 2°C temperature rise by 2030¹

\$2.5 tn

additional investment per year is required to meet UN Sustainable Development Goals by 2030²

\$150 bn

of Green Bond issuances expected in 2017³

... hence we will continue to facilitate access to finance for areas including environmental financing and low-carbon infrastructure

£21.1 bn

financing for selected social and environmental segments in 2016⁴

£1.3 bn

Green Bond portfolio continues to grow towards £2bn goal⁴

500 MW

of clean energy in the UK and Ireland was supported by our Corporate Bank in 2016⁴

¹New Climate Economy | ²United Nations Sustainable Development Goals | ³Climate Bonds Initiative | ⁴Barclays PLC ESG Supplement 2016 |

Barclays is committed to the Green and ESG financing sector...

Barclays MSCI Green Bond Index

Launched in 2013 as first of its kind and updated in 2014, the index family offers investors an objective and robust measure of the global market for Green Bonds

Green Innovation Finance

Barclays offers a financing solution for SMEs undertaking innovative activities resulting in improved environmental protection or sustainable products and services, partly guaranteed by the European Investment Fund and offered at competitive prices

Green Bond and ESG Origination

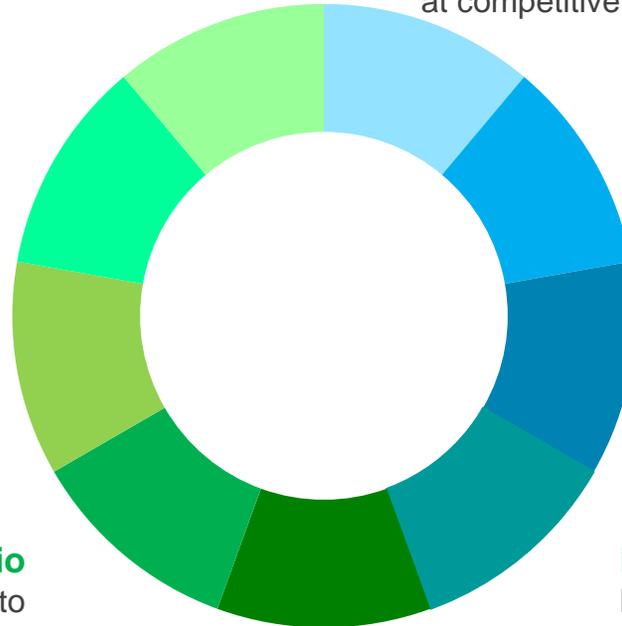
Our Investment Bank has helped clients issue more than £17.6bn of Green and ESG Bonds since 2016¹

Equity Research

We launched an ESG-focused Impact Series through the Barclays Investment Bank Research department

£2bn Green Bond Portfolio

Barclays Treasury continues to grow our Green Bond portfolio, towards £2bn goal²



Green Loans

We offer a flexible financing solution to support corporate environmental goals, where proceeds are used for qualifying projects and investments in line with our Green Product Framework

Agriculture

Our Agriculture team in the Business Banking unit have supported financing for renewable technology on farms across the UK³

Renewable Project Finance

Barclays Corporate Bank has supported the financing of over 500MW of clean energy in the UK and Ireland in 2016, equivalent to powering c.220,000 homes per annum²

Multi-Impact Investing Fund

Barclays Wealth plans to launch a unique impact investing fund

¹ Bloomberg | ² Barclays PLC ESG Supplement 2016 | ³ <https://www.barclayscorporate.com/sector-expertise/agriculture.html> |

...supported by Barclays Green Banking Council and strengthened by its Green Product Framework

Barclays Green Banking Council was established in January 2017 to drive development of innovative products and services that support our clients and customers in their transition towards a low carbon and sustainable future.

Barclays Green Product Framework¹ is used to guide the development of themed Green Products which reference a specific Green use of proceeds. The framework was developed in collaboration with Sustainalytics.

Chairman

- Rhian-Mari Thomas

Council Members

- Over 70 key stakeholders from every business area of the bank

Objectives

- Facilitate rapid delivery of innovative Green products and services
- Co-ordination for Green innovation across all business areas
- Engrain sustainability into everyday working practices
- Promote sharing of best practices



Green Product Framework

Introduction
Barclays' success and prosperity is intimately linked to the success and prosperity of the communities in which we live and work. This principle guides the way we do business and drives our commitment to play a leading role in the transition towards a sustainable environment and low carbon global economy. In order to deliver long-term sustainable value, we consider that when customers and clients do well, so do we. When the communities we live and work in thrive, we do too. And when society prospers, we all do—it's not one, or the other.

Climate change and resource scarcity are acknowledged as two of the greatest global challenges facing our society today. As a global institution, we support our clients and communities as they adopt measures to mitigate and adapt to climate change such as clean technologies and disaster resilience. Within this area, we continue to support global partnerships such as the United Nations Environment Programme Finance Initiative, Equator Principles, the Banking Environment Initiative and the Green Finance Initiative. In addition, we are members of and signatories to the Financial Stability Board sponsored Taskforce on Climate-Related Financial Disclosures.

We acknowledge the validity of climate science and support the efforts of governments and non-governmental organisations (NGOs) around the world aiming to limit global temperature rise to two degrees Celsius above pre-industrial levels.

Barclays has a strong and longstanding commitment to managing the environmental and social risks associated with lending. Our approach to environmental and social risk management is based on a combination of policy, standards and guidance. This enables us to adopt a robust approach, while maintaining the flexibility to consider potential clients and transactions on their respective merits. Barclays has a dedicated Environmental Risk Management (ERM) team in place to advise on client transactions that have associated environmental or climate related risks.

Barclays also manages our own operational carbon emissions and have committed to a target to reduce global carbon emissions by 30% by the end of 2018, compared to a 2015 baseline. We plan to achieve this by investing in low carbon technology and improving the energy efficiency of our operations.

External review process
This framework was developed in collaboration with Sustainalytics and Version 1.0 has been reviewed and approved by Sustainalytics.

Barclays Citizenship & Reputation team is responsible for developing and maintaining the overall Barclays Green Product framework and underlying qualifying themes and activities, with input and guidance from the business, as currently represented by the Green Banking Council. Information and understanding on environmental matters continues to evolve and Barclays will commit to review this framework on an annual basis to evaluate if any changes need to be made to add additional qualifying activities or if any qualifying activities need to be removed.

SUSTAINALYTICS

Barclays has collaborated with Sustainalytics, a leading global provider of environmental, social and corporate governance research and ratings, to develop a custom impact eligibility framework that identifies projects and activities that have a positive environmental impact. Sustainalytics has extensive experience in supporting financial institutions in developing eligibility criteria for green products and funds and providing external review for green bonds.

Green Product Framework | 1

Green Product Framework | 2

¹ https://www.home.barclays/content/dam/barclayspublic/docs/Citizenship/BAR_GreenProductFramework.p1.p1.pdf |

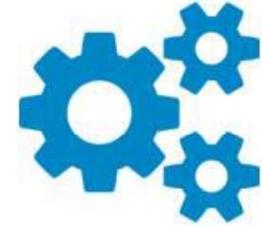
Our Green financing solutions are complemented by wide-scale engagement with environmental initiatives...



...while sustainability is engrained in our day-to-day activities

Social Innovation Facility (SIF)¹

- Launched in 2012, the SIF acts as a catalyst for developing innovative products and services
- Invested in **over 45 projects** delivering **sustained social impact** and ongoing commercial returns



Environmental Risk Unit¹

- Barclays has a **dedicated Environmental Risk Management (ERM) team** in place to advise on client transactions that may have environmental or climate related risks
- Regular dialogue between ERM and credit managers ensures environmental issues form part of our credit risk assessments
- Reports directly to Managing Director of Group Credit Risk

London Environment Network

- Barclays launched a new colleague network entitled the London Environment Network (LEN) to raise awareness, drive action and foster collaboration around environmental issues amongst colleagues
- Serves as a platform to promote discussion of new and relevant business propositions



Corporate Real Estate Solutions¹

- Barclays launched a new target to achieve a 30% carbon reduction by 2018 against the 2015 baseline and achieved a 15.8% reduction at the end of 2016
- Barclays runs a programme to deploy managed energy efficiency initiatives in our property portfolio
- In 2016 we built the foundation to capture and report environmental performance data from our top 40 suppliers and aim to expand to 150 suppliers in 2017

¹Barclays PLC ESG Supplement 2016 |

Barclays sustainability ratings and ESG benchmarks

Barclays performance across most major ESG ratings continues to show year-on-year increases

Rating	Scope	Barclays performance
 <p>MEMBER OF Dow Jones Sustainability Indices In Collaboration with RobecoSAM</p>	Environment, Social, Governance (ESG) – benchmark and index products	<p>DJSI score of 83pts vs. industry average of 58pts Scored 88pts on Environmental Dimension vs. industry average of 55pts</p> <p style="text-align: right;">Sep 2017</p>
 <p>FTSE4Good</p>	Environment, Social, Governance (ESG) – benchmark and index products	<p>Increased absolute ESG scored from 3.9/5 to 4.3/5 Increased Environmental and Social theme scores</p> <p style="text-align: right;">Jul 2017</p>
 <p>MSCI ESG Research</p>	Environment, Social, Governance (ESG) – key investor rating/ data set and index product provider	<p>Maintained BBB Rating Top quartile scores on <i>Financing Environmental Impact</i> and <i>Access to Finance</i> categories</p> <p style="text-align: right;">Dec 2016</p>
 <p>SUSTAINALYTICS</p>	Environment, Social, Governance (ESG) – key investor rating	<p>Increased Sustainalytics ESG score by 1pt to 62pts between Nov 2015 and Nov 2016 Outperformed on Social themes</p> <p style="text-align: right;">Nov 2016</p>

Contact Details

Billy Suid

Managing Director
Co-Head of Capital Market Execution

+ 44 (0)207 773 9253
billy.suid@barclays.com

Rhian-Mari Thomas

Managing Director
Chairman Barclays Green Banking Council

+ 44 (0)207 116 6482
rhian-mari.thomas@barclays.com

Dan Colvin

Assistant Vice President
Investor Relations

+ 44 (0)207 116 6533
daniel.colvin@barclays.com

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