



AIB Green Bond Impact Assessment Methodology

For eligible mortgage assets in Ireland

April 2020



The Carbon Trust's mission is to accelerate the move to a sustainable, low carbon economy. It is a world leading expert on carbon reduction and clean technology. As a not-for-dividend group, it advises governments and leading companies around the world, reinvesting profits into its low carbon mission.



AIB is a financial services group operating predominantly in the Republic of Ireland and the UK. They provide a comprehensive range of services to personal, business and corporate customers in their target markets and have leading market shares in banking products in the Republic of Ireland.

Authors:

Morgan Jones

Associate Director, Assurance

Morgan.Jones@CarbonTrust.com

Chantalle Thomson

Manager, Green Finance

Chantalle.Thomson@CarbonTrust.com

Christina Iona

Associate, Business Services

Christina.Iona@CarbonTrust.com

Vitaliy Komar

Analyst, Green Finance

Vitaliy.Komar@CarbonTrust.com

Abbreviations

AIB Impact tool developed by the Carbon Trust to calculate the impact and avoided emissions of the AIB Green Residential Buildings included in the eligible asset pool for the green bond

Avoided carbon emissions the avoided carbon emissions of the underlying properties when comparing them against a baseline of the average residential property in Ireland, on an annual basis. The avoided emissions are a result of these properties being more efficient and less carbon intensive than the average property in Ireland

Baseline the average energy and carbon intensity of domestic properties in Ireland, calculated from the SEAI BER Research tool

BER (Building Energy Rating) an indication of the energy performance of residential or commercial premises (represented as kWh/m²/year) in Ireland

Eligible Green Project Portfolio eligible green bond use of proceeds as outlined in the Framework

Framework AIB's green bond framework outlines its green bond processes and procedures for (1) Use of Proceeds, (2) Process for Project Evaluation and Selection, (3) Management of Proceeds, and (4) Reporting

Green Residential Buildings a category of the eligible the green bond portfolio as defined in the Framework

SEAI BER Research tool developed by the SEAI and provides a database of BER certificates for all domestic properties in Ireland (that have been assessed)

Contents

Abbreviations.....	2
1. Introduction	4
2. Methodology.....	5
2.1 Building Energy Ratings (BER).....	5
2.2 SEAI database.....	6
3. Impact calculation	8
4. AIB Impact Tool	9

1. Introduction

Aligned with its sustainability strategy, Allied Irish Banks (“AIB”) is intending to issue green bonds to finance and / or refinance loans that meet the requirements as described in the AIB Green Bond Framework (“Framework”)¹. The objective of the Framework, and subsequent green bonds issued from it, is to fund projects or assets that mitigate climate change by reducing emissions, protect ecosystems or otherwise have a positive environmental impact. The Framework has been aligned to the ICMA Green Bond Principles, and has received a Second Party Opinion from Sustainalytics.

The ICMA Green Bond Principles are a set of voluntary guidelines that recommend transparency and disclosure and promote integrity in the development of the green bond market by clarifying the approach for issuing a green bond. The Framework therefore has four key components:

- 1) Use of Proceeds
- 2) Process for Project Evaluation and Selection
- 3) Management of Proceeds
- 4) Reporting

For each green bond issued, AIB asserts that it will adopt (1) Use of Proceeds, (2) Process for Project Evaluation and Selection, (3) Management of Proceeds, (4) Reporting, as set out in the Framework.

AIB, at its discretion but in accordance with the Green Bond Principles, will allocate the net proceeds of the Green Bonds to an eligible loan portfolio of new and existing green loans (“Eligible Green Project Portfolio”). The Eligible Green Project Portfolio are to be financed and/or refinanced in whole or in part by an allocation of the bond proceeds.

The Eligible Green Project Portfolio includes “Green Residential Buildings”, the criteria for which are set out below:

- a) New or existing residential buildings, belonging to the top 15% low carbon buildings in the local context. This will be demonstrated by a Building Energy Rating (BER) label of B3 and better;
- b) New or existing residential buildings that have been built from 2015 and later;
- c) Refurbished residential buildings with at least a 30% improvement in energy efficiency.¹

AIB would like to report on the avoided emissions impact of the Green Residential Building mortgages financed and/or refinanced from the proceeds of the green bond(s) on an annual basis. Avoided emissions in this analysis is defined as the avoided carbon emissions of the underlying properties when comparing them against a baseline of the average residential property in Ireland, on an annual basis. The avoided emissions are a result of these properties being more efficient and less carbon intensive than the average property in Ireland.

The Carbon Trust has therefore been commissioned to develop a methodology and tool to allow AIB to calculate the annual avoided emissions impact of the Green Residential Building assets within the Eligible Green Project Portfolio.

¹ <https://aib.ie/investorrelations/debt-investor/green-bonds>

2. Methodology

In order to calculate the impact of the pool of Green Residential Buildings, it's necessary to understand the annual carbon footprint of each property and compare it against a baseline, to understand its incremental impact.

The boundary of the carbon emissions assessment includes the carbon emissions associated with the electricity and fossil fuel (eg. oil, natural gas) use in the property on an annual basis.

As AIB does not have access to the actual energy consumption and carbon emissions of each property in their pool of Green Residential Buildings, this requires assumptions to be made for each property. Building Energy Rating (BER) certificates have been identified as the most appropriate proxy to estimating these figures.

The identified baseline is the annual carbon emissions of the average domestic property in Ireland. This aligns with the approach used in the green bond market for assessing the impact of green bonds that are financing/ refinancing residential and commercial properties. The baseline calculation will also be derived from BER certificate information.

2.1 Building Energy Ratings (BER)

BER certificates in Ireland provide an indication of the in use energy performance of residential and commercial premises (represented as kWh/m²/year). The certificate rates each building on a scale of A-G with A being the most energy efficient and G the least energy efficient. Each building which is put forward for sale or lease requires a BER certificate.

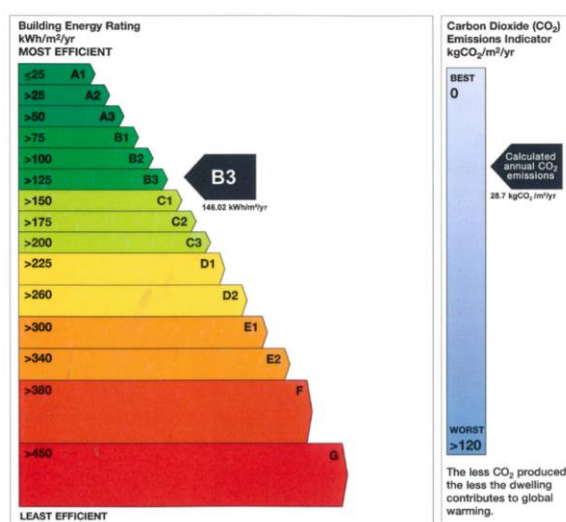


Figure 1: Illustration of a BER certificate indicating A-G scale and the building rating of B3 in this instance. The BER certificate also provides information on the kWh/m²/yr and kgCO₂/m²/yr ⁽²⁾

A BER indicates the energy performance of a dwelling based on the energy use for space and hot water heating, ventilation and lighting. Actual performance will depend on how the occupants operate the dwelling.

² BER certificate received from AIB on 04/02/20 and used here for illustration purposes only

BER certificates also provide information on the total emissions of the dwelling in kgCO₂/m²/yr, which is determined by the source of energy supply such as electricity, natural gas etc.

BER ratings and calculations are based on the major characteristics of a domestic property including building orientation, insulation levels, type, efficiencies and operation of heating, cooling, DHW and lighting systems. Occupancy patterns are also included in the calculation of a BER and these are calculated on the basis of a notional family with a standard occupancy pattern. However, actual energy consumption of the dwelling may vary significantly, depending on occupancy patterns, systems controls and operations and may differ significantly from assumptions made in a BER calculation. Despite the stated limitations, BER data is considered to be a good relative indicator of projected energy consumption and carbon emissions, and is the best proxy to use given that AIB do not have access to the actual energy consumption and carbon emissions of their pool of Green Residential Building mortgages.

AIB has the BER certificate information for each property, however, not all the BER certificate data is available in AIB 's systems to be extracted. At present, only the BER category (A1, A2 etc.) is extractable, therefore the methodology is designed to cope with this limitation, but also utilise the BER energy and carbon intensities when they become available.

2.2 SEAI database

The Sustainable Energy Authority of Ireland (SEAI) has developed the National BER Research Tool³ which provides access to the BER certificate data for all domestic properties in Ireland (that have been through the BER assessment process). The database provides BER certificate data and information for approximately 890,843 domestic properties in Ireland and consists of properties built between 1753 to 2020.⁴ This database represents approximately 50% of all domestic properties when comparing against the 2011 Census of Population.

Baseline

The data provided in the BER Research Tool is used to establish the baseline (country average) in energy use (kWh/m²/yr) and carbon emissions (kgCO₂/m²/yr) for domestic properties in Ireland.

SEAI states in the User Information Guide of the BER tool that it manages a quality assurance system for the BER database, however, it takes no responsibility for undetected errors in the data set. Therefore, the Carbon Trust has performed a supplementary analysis of the BER database. BERs that, to the best of our knowledge, are considered unrealistic have been excluded for inclusion in the BER analysis. Specifically, BER values of a) zero or less and b) 500kWh/m²/yr or more, have been excluded.

The Carbon Trust assumes that there are no duplicates in the SEAI database, as has been verbally confirmed by representatives at SEAI. It is understood that if a property has been through multiple BER assessments, the latest (newest) BER certificate data is presented in the database. Therefore all properties, excluding the outliers mentioned in the previous paragraph, have been considered in the analysis.

³ <https://ndber.seai.ie/BERResearchTool/ber/search.aspx>

⁴ The latest update of the SEAI database was used in the AIB impact tool dated 20/02/2020

The average BER of all properties in Ireland, which have a BER certificate and are included in the latest available data in BER Research Tool (excluding the outliers mentioned above) is estimated to be 222.0 kWh/m²/year. The average CO₂ emissions intensity for the same properties is estimated at 51.0 kgCO₂/m²/year.

As discussed in a previous report by AIB⁵, the distribution of properties in the BER Research Tool is likely skewed slightly towards more efficient properties. This is expected given that BER ratings are only required for new, sold or rented properties, and the tool represents 50% of all properties. On discussion with AIB, we decided not to correct for this in the methodology when calculating the baseline as it would have required further assumptions to be made in the methodology. This is a conservative approach and in practice the average carbon intensity in Ireland is likely to be slightly higher than the baseline used in this analysis.

It is unclear as to when the BER Research Tool will be updated by SEAI and to what extent this will affect the BER benchmarks. The Carbon Trust suggests that AIB undertakes a review of the AIB impact tool and updates the SEAI input on an annual basis.

AIB data gaps

Where the AIB only has the BER category (e.g. A1, A2) on file for each domestic property, the SEAI National BER research tool has been used to estimate the carbon and energy intensity for those properties.

To do this, the average intensities for the properties contained in the SEAI BER Research Tool have been calculated for each BER category. Where the intensities are missing for properties within the pool of Green Residential Buildings, the estimated intensities are matched to each property using the property's BER category.

⁵ <https://aib.ie/content/dam/aib/investorrelations/docs/debt-investors/green-bonds/residential-buildings-in-ireland-top-15-percent.pdf>

3. Impact calculation

The section describes the calculations required to calculate the impact of the properties within AIB’s pool of Green Residential Buildings, and reflect the availability of data.

Step 1: Determining the baseline carbon intensity (CO2/m2/yr):

$$\frac{\sum \text{Carbon Intensities of dwellings in SEAI National BER Research Tool}}{\text{Number of properties in SEAI National BER Research Tool}}$$

In step 1, as per 2.2, the data from the SEAI National BER Research tool used in the analysis does not include the identified outliers in the analysis

Step 2: Calculating the carbon impact (avoided CO2/year) of properties in AIB eligible green mortgage portfolio, against the baseline scenario.

$$\sum_{\text{Eligible mortgages}} -(\text{Carbon Intensity of Dwelling} - \text{Baseline Carbon Intensity}) \times \text{Floor area of Dwelling}$$

Carbon intensity: CO2/m2/year

Floor area: m2

In step 2, as discussed in 2.1 and 2.2, the carbon intensity of each dwelling with either be derived from the BER certificate of the dwelling, or derived from the average carbon intensity for dwellings in that BER category as per the SEAI National BER research tool.

The equivalent calculations have been done to calculate the reduced in energy consumption using the energy intensity metrics (kgCO2/m²/yr).

Attribution

As per the guidance of the Partnership for Carbon Accounting Financials (PCAF), and in line with impact reporting in the market for green bonds and mortgages, AIB will not apply an attribution factor to the impact value, as they are the only provider of the mortgage. “Mortgages are one of the few asset classes where a financial institution can directly engage with its customers and take responsibility for a societal challenge. The energetic characteristics of the financed properties are taken into account in investment decisions regardless of the size of the mortgages. Also, PCAF is not in favour of using loan-to-value (LTV) ratio as this leads to emissions fluctuating with property value”.⁶

⁶ Harmonising and Implementing a carbon accounting approach for the financial sector, This report was commissioned by PCAF (Platform Carbon Accounting Financials) and compiled, edited and reviewed by Navigant, Netherlands, November 2018

4. AIB Impact Tool

The AIB Impact tool has been developed by the Carbon Trust to allow the AIB’s team to calculate the impact of a given pool of Green Residential Buildings, by comparing the energy and carbon characteristics of the properties against the national average carbon and energy intensities of domestic properties in Ireland. The benchmark tool consists of four main tabs:

- SEAI BER Database Inputs
- AIB Inputs
- Calculations
- Dashboard

The ‘SEAI BER Database Inputs’ tab displays the information imported from the SEAI Research tool on 20/02/2020 and is used for estimating the baseline for domestic properties in Ireland, and informing the carbon intensity and energy intensity of AIB’s portfolio where this data is not in the system. It is recommended that AIB look to refresh this annually.

The AIB Inputs tab will be used by AIB to input information about the underlying properties of their eligible green mortgage portfolio. This tab will be updated by AIB and the inputs required are shown below. The Dwelling BER category and Property Floor area are the two **essential inputs**.

Inputs	Explanation
Loan account number	
Dwelling address line 1	
Town	
Postcode	
Property floor area	Units of measure: m ²
BER number	9-digit number printed on the BER certificate
Dwelling BER category	As shown on the BER certificate on a scale from A1 to G
Dwelling BER	Units of measure: kWh/m ² /year
Dwelling CO2 emissions	Units of measure: kgCO ₂ /m ² /year
Currency	EURO
Property value	
Original mortgage value	
Outstanding mortgage value	

Table 1: AIB Input requirements to the AIB Mortgage Impact tool

The calculation tab uses the input data from the SEAI database and AIB Inputs, to calculate the impact of each property in the portfolio against the baseline. Further analysis is also done on this tab to feed into the results and graphs presented on the Dashboard tab.

The Dashboard tab is therefore the key tab for AIB, which presents the results of the impact calculation as well as other key metrics for reporting. The key metrics on the dashboard include:

Metric	Units
Total number	
Average BER	kWh/m2/year
Average carbon emissions intensity per property	kgCO2/m2/year
Average BER category	
Total property value of mortgage pool	EUR
Total original mortgage value of mortgage pool	EUR
Total outstanding mortgage value of mortgage pool	EUR
Total est. carbon emissions of properties	tonnes CO2/year
Total est. reduced emissions of properties against baseline	tonnes CO2/year
Total est. energy consumption of properties	kWh/year
Total est. reduced energy consumption of properties against baseline	kWh/year

Table 2 Key metrics displayed on the impact tool dashboard

The Carbon Trust is an independent company with a mission to accelerate the move to a sustainable, low-carbon economy. The Carbon Trust:

- > advises businesses, governments and the public sector on opportunities in a sustainable, low-carbon world;
- > measures and certifies the environmental footprint of organisations, products and services;
- > helps develop and deploy low-carbon technologies and solutions, from energy efficiency to renewable power.

www.carbontrust.com

+44 (0) 20 7170 7000

Whilst reasonable steps have been taken to ensure that the information contained within this publication is correct, the authors, the Carbon Trust, its agents, contractors and sub-contractors give no warranty and make no representation as to its accuracy and accept no liability for any errors or omissions. Any trademarks, service marks or logos used in this publication, and copyright in it, are the property of the Carbon Trust. Nothing in this publication shall be construed as granting any licence or right to use or reproduce any of the trademarks, service marks, logos, copyright or any proprietary information in any way without the Carbon Trust's prior written permission. The Carbon Trust enforces infringements of its intellectual property rights to the full extent permitted by law.

The Carbon Trust is a company limited by guarantee and registered in England and Wales under Company number 4190230 with its Registered Office at: 4th Floor, Dorset House, 27-45 Stamford Street, London SE1 9NT.

Published in the UK: April 2020

© The Carbon Trust 2018. All rights reserved.

