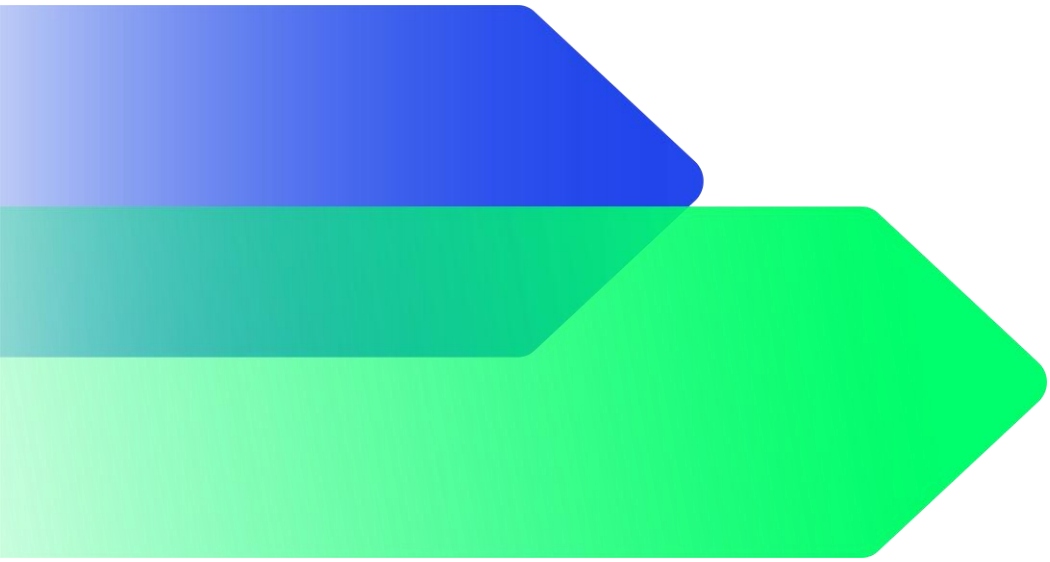
REPORT

PTSB 2024 Green Bond Impact Assessment

February 2025



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Glossary

Avoided carbon emissions	The avoided carbon emissions of the underlying properties when comparing them against a baseline of the average property across 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 properties by sector and geography, informed by the SEAI datasets.
BER (Building Energy Rating)	An indication of the energy performance of residential or commercial premises (represented as kWh/m^2/year) in Ireland.
Delivered Energy	The amount of energy that enters the building (and is used) without adjustment for any energy loss in the generation, transmission, and distribution of that energy.
Eligible Green Loan Portfolio	The pool of eligible assets as outlined in the Green Bond Framework.
Primary Energy	The total amount of energy used, including the final energy used directly by the end-user, but also the energy inputs to transformation processes such as electricity generation and oil refining and other losses such as electricity transmission and distribution.
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).
SEAI non-domestic database	A database provided by SEAI containing the BER certificate data of non-domestic properties in Ireland (that have been assessed).

Introduction

Permanent TSB Overview

Aligned with its sustainability strategy, Permanent TSB ("**PTSB**") intends to issue finance and/or refinance Green Eligible Loans with a positive environmental benefit that meets the requirements as described in the PTSB Green Bond Framework ("**Framework**")[1]. The objective of the Framework, and subsequent loans issued from it, is to use an amount equal to the net proceeds of any green bond instrument to fund assets that help to mitigate climate change through reduced carbon emissions and energy demand, protect vulnerable ecosystems, and support the ten strategic outcomes of Project Ireland 2040[2], the 17 UN Sustainable Development Goals[3] and Irelands Climate Action Plan[4]. The Framework has been aligned with the ICMA Green Bond Principles (June 2022) and has received a Second Party Opinion from Sustainalytics.

This report presents the results of the impact assessment for PTSB's 2024 Green Bond Issuances. The methodology behind the results presented in this document can be found on the PTSB website[5]. In accordance with the PTSB Green Bond Framework dated December 2023, this document provides:

1. A description of the Eligible Green Projects;
2. The breakdown of the Eligible Green Projects by nature of what is being financed;
3. Metrics regarding Eligible Green Projects' environmental impacts.

Description of Eligible Green Residential Buildings Projects

PTSB, at its discretion but in accordance with the ICMA Green Bond Principles[6], will allocate the net proceeds of the Green Bonds issued under the Framework, to a loan portfolio of new or existing loans in certain Eligible Green Categories.

The Eligible Green Loan Portfolio will exclusively finance or refinance assets according to the criteria set out below[1]:

New Residential Buildings

- For buildings completed prior to the 1st of January 2021

[1] PTSB Green Bond Framework

[2] Project Ireland 2040

[3] Sustainable Development Goals

[4] Climate Action Plan 2023

[5] PTSB Methodology

[6] ICMA Green Bond Principles – June 2021 (June 2022 Appendix 1)

    - Those that belong to the top 15% of the most energy-efficient buildings in the Republic of Ireland.[7]
- For buildings completed on or after the 1st of January 2021
    - Residential buildings that have a primary energy demand >10% lower than the local Nearly Zero-Energy Building (NZEB) regulation.[8]

Refurbished Residential Buildings

- Buildings with at least a 30% improvement in energy efficiency[9]
    - When such an improvement is derived from BER labels, a minimum floor of a "C3" BER label will be implemented.

PTSB would like to report on the avoided energy and emissions impact of the Eligible Green Loan Portfolio financed and/or refinanced on an annual basis. Avoided emissions in this analysis are defined as the avoided carbon emissions of the underlying properties when comparing them against a baseline of the average domestic 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 respective property type in Ireland. The Carbon Trust has therefore been commissioned to develop a methodology and tool to allow Permanent TSB to calculate the annual avoided emissions impact within the Eligible Green Loan Portfolio.

[7] At the time of writing, based on publicly issued governmental statistical data, Irish residential buildings with BER rating of A, B1 and B2 are in scope.

[8] In line with the EU EPBD directive, Ireland carries out a cost optimal analysis to define NZEB requirements. PTSB will calculate the NZEB-10% threshold as per the official cost optimal analysis, as published by the Department of Housing, Local Government and Heritage. At the time of writing, the cost optimal analysis for residential and non-residential buildings can be found here and here, respectively.

[9] Or alternatively, renovation complying with applicable requirements for major renovations as set in the applicable national and regional building regulations for 'major renovation' implementing Directive 2010/31/EU.

Environmental Impact of PTSB's Green Residential Buildings

The area of impact assessments related to green bonds and more widely the accounting of financed carbon emissions is developing rapidly. The aim is to represent current best practice and where possible move that forward. To this end we have considered current market practice, recognised impact reporting standards including ICMA's Harmonized Framework for Impact Reporting[10], and from the related area of emissions reporting, the PCAF methodologies[11], specifically around attribution.

Market practice in green bond impact assessments, typically presents the total avoided emissions from a given asset allocated to the bond. To give as complete a picture as possible we have presented the impact related to PTSB's mortgage lending with the headline impact figures (total asset impact attribution) as per market practice but also included a secondary analysis attributing the impact according to the outstanding loan amount (outstanding loan attribution) to the relevant assets.

The Eligible Green Project Portfolio is assessed regarding the following environmental impacts:

Green Residential Buildings

- Estimated annual energy consumption (in MWh/year)
- Estimated annual avoided energy consumption (in MWh/year)
- Estimated annual avoided emissions (in tons CO_2/year)

[10] ICMA Harmonized Framework for Impact Reporting – June 2023

[11] PCAF Financed Emissions - Part A (Dec 2022)

Table 1: Estimated environmental impact from PTSB's Green Residential Building Portfolio by dwelling type, as of December 31, 2024

Dwelling Type	Number of eligible projects	Eligible portfolio (M€)[12]	Share of Total Financing[13]	ICMA Eligibility (%)	PTSB attributed annual avoided emissions (tCO_2/year)	PTSB attributed annual energy consumption (MWh/year)	PTSB attributed annual avoided energy consumption (MWh/year)	Weighted Data quality score (1 is highest, 3 is lowest)
Detached house	1,646	405.7	35%	100%	6,711	12,271	28,388	2
End of terrace house	401	107.9	9%	100%	1,230	1,786	5,040	2
Semi-detached house	1,717	447.8	39%	100%	5,534	8,196	22,844	2
Mid-terrace house	538	143.6	13%	100%	1,553	2,552	6,334	2
Mid-floor apartment	73	17.7	2%	100%	130	380	486	2
Top-floor apartment	45	11.1	1%	100%	107	271	416	2
Maisonette	26	6.2	1%	100%	71	186	273	2
Ground-floor apartment	29	7.1	1%	100%	60	156	234	2
House	1	0.2	0%	100%	4	6	15	2
Total	**4,476**	**1,147**	**100%**	100%	**15,401**	**25,804**	**64,030**	2

[12] Signed amount represents the amount legally committed by the issuer for the portfolio or portfolio components eligible for Green Bond Financing

[13] This is the share of the total portfolio cost that is financed by the issuer per Eligible Category

Data Quality

To address the difficulties in obtaining data for estimating emissions avoided by a Residential Property, three options have been devised by CT, all of which provide a sufficient understanding of the emissions associated with the property to assess the impact. These data quality scores ranging from the highest quality to the lowest quality are: **Score 1**, which relies on actual energy consumption, supplier-specific emission factors, and actual emissions intensity; **Score 2**, which relies on official energy ratings, BER number associated BER energy intensity and CO_2 emission intensity; and **Score 3**, which relies on estimated BER and estimated carbon intensity. Score 1 is the preferred choice, offering the highest level of detail and accuracy, while Option 3, although less detailed, is still adequate for estimating the impact of the green mortgage.

As can be seen in Table 1, PTSB's Green Mortgage Impact Assessment contained a weighted data quality score of 2 across the portfolio, meaning that PTSB were able to provide actual complete BER data for each property in the portfolio. For context, it is unrealistic for banks to be able to collect actual energy consumption for all assets within its portfolio to obtain a data quality score of 1. However, we have provided this as a target for PTSB over the next couple of years should access to this data become more available.

Table 2: Emission Intensities from PTSB's Green Mortgages Portfolio by dwelling type, as of December 31, 2024

Dwelling Type	PTSB attributed avoided emissions intensity (tCO_2e/mEUR)	PTSB attributed avoided emissions per m^2 ($kgCO_2e/m^2$)	PTSB attributed avoided energy intensity (kWh/m^2)
Detached house	16.54	35.24	149.07
End of terrace house	11.41	38.49	157.65
Semi-detached house	12.36	38.06	157.13
Mid-terrace house	10.82	37.32	152.19
Mid-floor apartment	7.34	31.96	119.77
Top-floor apartment	9.61	33.30	129.33
Maisonette	11.42	33.22	126.89
Ground-floor apartment	8.48	32.93	128.02
House	16.44	37.72	155.50
Total	**13.42**	**36.60**	**152.18**

Attribution

The attribution methodology for the green mortgages is as follows; The outstanding loan value was divided by the property value to provide the share of avoided emissions that can be attributed to PTSB (referred to as the 'attribution factor'). In line with PCAF, the property value at origination was used

where available; where this was not available, then the latest property value was used. If neither property value at origination nor latest property value was available, the loan to value ratio was used instead.

In addition to the impact metrics reported in Table 1, which are in line with the ICMA recommendations, Table 2 represents different intensity metrics, including the weighted emissions and energy intensities for each dwelling type based on the outstanding loan amount to provide an indication of PTSBs contribution to each loan.

Table 3: Estimated CO2 emissions avoidance and attribution from PTSB's Green Residential Building portfolio, as of December 31, 2024

Dwelling Type	PTSB attributed annual avoided emissions (tCO_2/year)	Weighted average attribution factor per dwelling type (%)[14]
Detached house	6,711	60%
End of terrace house	1,230	70%
Semi-detached house	5,534	69%
Mid-terrace house	1,553	69%
Mid-floor apartment	130	75%
Top-floor apartment	107	72%
Maisonette	71	75%
Ground-floor apartment	60	71%
House	4	52%
Total	**15,401**	**66%**

BER Breakdown

When looking at the total of the PTSB 2024 impact assessment, as can be seen in Table 5 there is a clear correlation between BER rating and environmental performance, with the largest benefits being properties with a BER category of A1 and the least being B2.

Table 4: Estimated environmental impact from PTSB's Green Residential Building Portfolio by BER category, as of December 31, 2024

BER Category	Number of loans	Outstanding loan amount (MEUR)	Attributed floor area (m2)	Attributed Avoided Emissions (tCO2e)	Attributed energy consumption (MWh)	Attributed avoided energy consumption (MWh)
A1	280	75	27,614	1,308	391	5,505

[14] The average is weighted based on the outstanding loan amount of each mortgage.

A2	1,456	404	146,808	6,133	5,830	25,515
A3	1,649	395	138,727	5,225	8,002	21,617
B1	322	77	32,508	942	2,941	3,999
B2	769	197	75,095	1,793	8,640	7,393
Total	**4,476**	**1,147**	**420,752**	**15,401**	**25,804**	**64,030**

Table 5: Emission Intensities from PTSB's Green Mortgages Portfolio by BER category, as of December 31, 2024

BER Category	PTSB attributed avoided emissions intensity (tCO_2e/MEUR)	PTSB attributed avoided emissions per m^2 ($kgCO_2e/m^2$)	PTSB attributed avoided energy intensity (kWh/m^2)
A1	17.33	47.36	199.36
A2	15.19	41.77	173.80
A3	13.24	37.66	155.83
B1	12.28	28.99	123.02
B2	9.11	23.87	98.45
Total	**13.42**	**36.60**	**152.18**

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+44 (0) 20 7170 7000

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