CLIMATE-RELATED ASPECTS OF THE BANCO DE ESPAÑA'S NON-MONETARY POLICY PORTFOLIOS

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1 Introduction

Since 2023 the Banco de España has published an annual report dedicated exclusively to the financial disclosure of the climate-related aspects of its non-monetary policy portfolios.[1] This initiative is part of the commitment to transparency made by the Eurosystem national central banks (NCBs) and the European Central Bank (ECB), as part of the common stance[2] adopted in 2021 for implementing sustainable and responsible investment (SRI) principles in these portfolios. In line with this commitment, in 2023 and for the first time, the 20 Eurosystem NCBs[3] and the ECB[4] published this information in a coordinated manner. They repeated the exercise in 2024, broadening the scope of the report to include non-euro-denominated portfolios.[5]

This third report, once again prepared in a coordinated manner and in line with the recommendations of the now disbanded Task Force on Climate-related Financial Disclosures (TCFD),[6] reaffirms the Banco de España's commitment to climate transparency.

As in previous reports, it is important to stress that the primary responsibility for combating climate change lies with governments. NCBs participate in the economic transformation needed to achieve the goals set out in the Paris Agreement and contribute to it insofar as their respective mandates allow. For instance, through disclosure exercises such as this report or by managing their investment portfolios in line with SRI principles. Since 2019, SRI principles have been a cornerstone of the Banco de España's own portfolio investment policy.[7] This approach is in line with Recommendation nº2 of the Network for Greening the Financial System (NGFS),[8] which the Banco de España joined in April 2018, and with the ten recommendations published by the NGFS in 2024 to further the integration of SRI practices.[9]

The incorporation of these principles forms part of the institutional sustainability commitment envisaged in the Banco de España's strategic plans.[10, 11] In this setting, the Bank focuses, in particular, on the climate change-related aspects that are directly related to its areas of action, including management of its own investment (non-monetary policy) portfolios.

1 Banco de España (2023).
2 ECB (2021).
3 ECB (2023).
4 All reports available at https://www.ecb.europa.eu/ecb/climate/climate-related-financial-disclosures/html/index.en.html.
5 Banco de España (2024a).
6 See TCFD (2017). The TCFD was set up in late 2015 by the Financial Stability Board (FSB), at the request of the G20, and was made up of representatives from the private sector. Its work entailed drafting a set of voluntary recommendations for the disclosure of consistent, comparable, accurate and clear information on climate change-related financial risks and opportunities. The TCFD was disbanded in late 2023 and its recommendations are now fully incorporated into the International Financial Reporting Standards (IFRS).
7 Banco de España (2025b).
8 NGFS (2019).
9 NGFS (2024).
10 Banco de España (2020).
11 Banco de España (2024c).

The analysis presented in this report confirms the sustained improvement over recent years in the quality of the Banco de España's investment portfolios, in terms of their contribution to combating climate change. Specifically, the proportion of these portfolios invested in green bonds has gradually increased, up to 5.4% of the total in 2024 (8.1% in the euro-denominated portfolios and 4% in the non-euro portfolios). These investments support projects that have a positive environmental impact and contribute to the transition towards a low-carbon economy.

The Banco de España remains committed to decarbonising its investment portfolios and will continue to monitor their climate-related dimensions, aiming to further progress towards full alignment with the Paris Agreement and with the climate-neutral goals established in European legislation.

2 Governance

The Banco de España manages various financial asset portfolios that are key to the discharge of its statutory functions.[12] These investments are grouped into three main categories:

1 *Monetary policy portfolios:* established in accordance with the monetary policy decisions adopted by the ECB's Governing Council.

2 *Third-party portfolios:* managed by the Banco de España on behalf of third parties.

3 *Investment portfolios:* created in response to other institutional needs and controlled exclusively by the Banco de España's management bodies, these portfolios are denominated both in euro and other currencies.

The Banco de España adopts an integrated approach for governance of the climate change-related risks and opportunities associated with the investment portfolios, addressing them through the existing governance structures. Specifically, the Executive Commission[13] is responsible for approving the financial investment policy, which sets out the core principles and decision-making and accountability procedures. In 2019 the Banco de España incorporated SRI as a basic management principle for its investment portfolios. In addition, financial investment guidelines are approved annually to guide short-term management.

Responsibility for integral portfolio management lies with the Directorate General Operations, Markets and Payment Systems, whose Director General is tasked with submitting proposals to the Executive Commission and reporting on their implementation. The Operations Department, with the support of the Investments Sub-Committee, is responsible for the day-to-day management of financial operations, while the Financial Risk Department, with the support of the Financial Risk Sub-Committee, oversees risk monitoring and management.

The SRI strategy is presented to the Executive Commission annually, as part of the approval process for the financial investment guidelines. Implementing and monitoring this strategy are an integral part of the responsibilities described in the previous paragraph.

Beyond matters related purely to financial investment, the Banco de España has reinforced its sustainability commitment with the creation of the Environmental, Social and Governance (ESG) Office, whose mission is to promote internal coordination, drive the analysis and dissemination of ESG criteria at both the national and the international level and provide strategic support to senior management.[14]

12 Law 13/1994 of 1 June 1994 on the Autonomy of the Banco de España. Treaty on the Functioning of the European Union (Official Journal of the European Union (OJEU) of 7 June 2016) and Statute of the European System of Central Banks and of the European Central Bank (OJEU of 7 June 2016).

13 The Executive Commission comprises the Governor, the Deputy Governor and two members elected by the Banco de España's Governing Council. The General Secretary and the Directors General attend its meetings, with the right to speak but not to vote. See https://www.bde.es/wbe/en/sobre-banco/organizacion/organos-rectores/comision-ejecutiva/.

14 Banco de España (2025b).

3 Strategy

The Banco de España's own portfolio investment policy is governed by market neutrality, prudence, professionalism, efficiency and SRI principles (Figure 1). Moreover, the Banco de España subscribes to the common stance adopted by the Eurosystem on the application of SRI principles to non-monetary policy portfolios.[15] In both cases, the aim is to actively contribute to the global response to climate change, in line with the Paris Agreement goals, by managing financial risks taking into account climate change considerations and channelling capital towards green and low-carbon investments, leading by example.

Specifically, the Banco de España has adopted a thematic strategy, creating a specific SRI portfolio that prioritises investment in assets associated with projects that have a positive environmental impact, explicitly incorporating the climate dimension into the risk-return analysis.

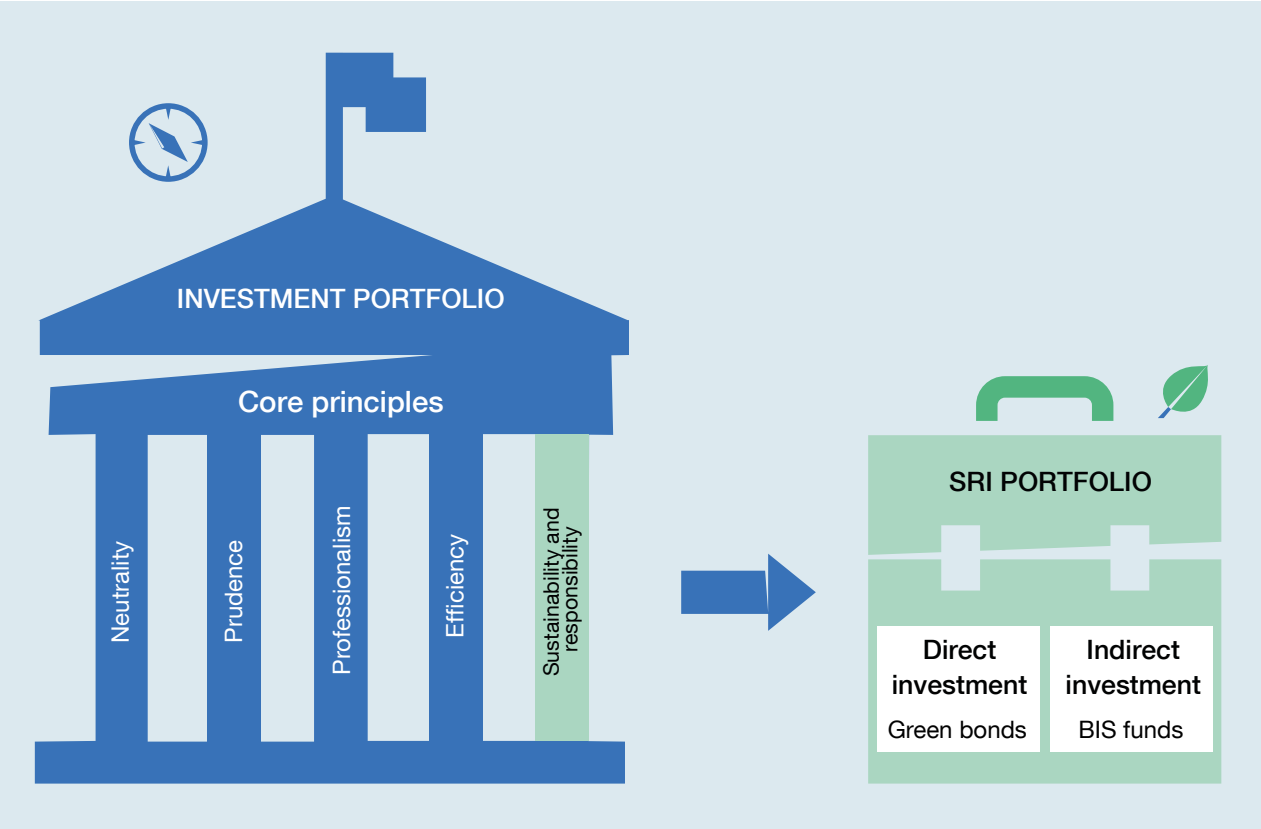
This SRI portfolio comprises direct investments in green bonds issued in various currencies, alongside holdings in (US dollar and euro-denominated) green investment funds managed by the Bank for International Settlements (BIS).

The Banco de España first participated in the BIS's green funds in 2019 (Figure 2), when the first dollar-denominated fund was launched to advance sustainable finance through investments in energy efficiency projects, renewables and other initiatives with a positive environmental impact.[16] Subsequently, in January 2021, the Banco de España extended its commitment, participating in the BIS's second investment fund, this time focused on euro-denominated green bonds.[17]

The Banco de España also systematically monitors the climate-related aspects of all its investment portfolios, in close coordination with the other Eurosystem NCBs. This work is explained in greater detail in Section 5 of this report.

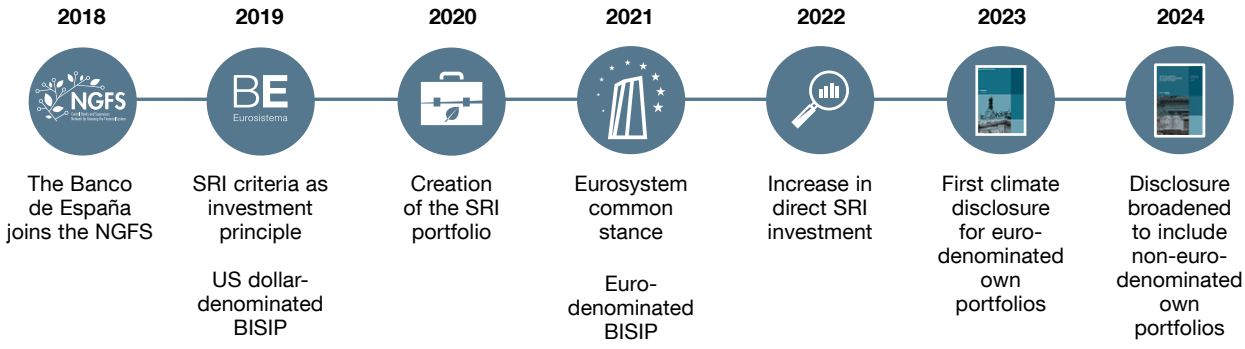
15 Banco de España (2021a).
16 Banco de España (2019).
17 Banco de España (2021b).

Figure 1
Key elements of the Banco de España's SRI strategy



SOURCE: Banco de España.

Figure 2
Key milestones in the Banco de España's SRI strategy



SOURCE: Banco de España.

4 Risk management

Central banks' investment portfolios are exposed to climate-related financial risks (hereafter, "climate risks"). The Banco de España has adopted the recommendations of the TCFD and distinguishes between transition and physical risks. Transition risks refer to the consequences (in terms of probability and impact) of adaptation to a carbon-neutral economy. Physical risks refer to extreme weather events and gradual or long-term climate change.

However, climate risks manifest through traditional financial risks: credit, market, liquidity and operational risk. Accordingly, they are a natural fit in the Banco de España's standard risk management procedures. Specifically, in the identification and analysis stage, the Banco de España employs traditional risk management tools, which capture climate risks reflected in prices, volatility and credit assessments, along with specific climate scenario analysis and stress-testing tools. Importantly, the Banco de España cooperates with the Eurosystem to improve both the methodologies used and the availability and quality of the climate data employed.

The Banco de España's risk strategies and policies seek to achieve the investment goals with the least possible risk, incorporating SRI principles. The investment framework takes into account the materiality of the climate risks in the portfolios and defines risk management priorities. The analysis conducted applies a "double materiality" perspective, considering both the potential impact of material climate risks – in the form of economic losses or adverse impact on capital – and the contribution of the Bank's balance sheet to long-term climate risks, essentially through the greenhouse gas (GHG) emissions of the agents whose securities make up the portfolio, or the GHG emissions saved thanks to investment in green bonds as opposed to conventional bonds.

As sovereign debt is the predominant asset class in the Banco de España's portfolios, transition risks depend on carbon emissions and the decarbonisation trajectory of the respective emission jurisdictions, alongside the transition policies being or to be implemented by the respective governments and national authorities. Physical risks across the different geographies can affect the market value of bonds in the near term and can also be a volatility factor.

In this setting, the investment portfolio goals leave limited scope for specific climate risk management measures. Nevertheless, the financial risk framework for such investments, focused on ensuring liquidity and prudent management, facilitates the efficient management of various risk factors, including climate risk. The Banco de España mitigates this risk through general measures such as setting limit systems to prevent an excessive concentration of exposure, alleviating both physical and transition risk. It also implements specific investment measures, such as the SRI portfolio, explained in detail in the Strategy section.

Since the Banco de España published its first climate disclosure report on its investment portfolios in 2023, transparency around portfolio climate risks has continued to improve gradually, in line with advances in the coverage and quality of the necessary data.

5 Metrics and targets

5.1 Metrics

This section presents the results for the most important climate metrics applied to the euro-denominated (see Section 5.1.1) and non-euro-denominated (see Section 5.1.2) portfolios, updating the data published in the 2024 report. This information covers more than 60% of the total financial assets at end-2024 (Chart 1). Gold holdings, special drawing rights (SDRs)[18] and cash and cash equivalents (such as deposits) are excluded from this analysis because there is no standard methodology to assess these assets from a climate standpoint.

Compared with previous reports, in this edition the coordinated exercise at Eurosystem level incorporates the disclosure of the total volume of scope 3 GHG emissions – indirect emissions[19] – for non-sovereign assets, as well as the aggregate proportion of social and sustainable bonds,[20] albeit in both cases with a limited impact insofar as this report is concerned.

Ever since the first edition of the report was published in 2023, the metrics used have been aligned with the recommendations set out in TCFD (2021), NGFS (2021) and Partnership for Carbon Accounting Financials (PCAF) (2022). The framework is also in line with the harmonisation guidelines adopted by the ECB's Governing Council for Eurosystem NCBs. In particular, the four metrics used are the following:[21]

- *weighted average carbon intensity;*
- *total GHG emissions;*
- *carbon footprint;*
- *carbon intensity.*

Weighted average carbon intensity (WACI) quantifies a portfolio's exposure to carbon-intensive issuers and is expressed in tonnes of CO_2 equivalent[22] per million euro. It is calculated by first

18 SDRs are included under claims on the International Monetary Fund (IMF). They are an international reserve asset created by the IMF to complement its members' official reserve assets. SDRs are defined in terms of a basket of currencies. Their value is determined as the weighted sum of the exchange rates of the five major currencies: the US dollar, the euro, the Japanese yen, the pound sterling and the Chinese renminbi.

19 Quality issues affecting scope 3 emissions data continue to limit their reliability and comparability over time. These issues include: (i) considerable estimation uncertainty; (ii) diverging estimates across different data providers; and (iii) methodological refinements. Despite these shortcomings, it has been decided to start reporting scope 3 total absolute carbon emissions.

20 Social bonds raise funds for projects that address or mitigate specific social problems and/or seek to achieve a positive social impact. Sustainable bonds combine social and green projects.

21 See Table A2.1 (Annex 2) for the formulae of the four metrics.

22 Carbon dioxide equivalent (CO_2e) is a measure used to compare different GHG emissions. It converts other GHG emissions into their CO_2 equivalent (i.e. with the same global warming potential). For more information, see Eurostat.

Chart 1
Financial assets of the Banco de España, 2024 (a)

SOURCE: Banco de España (2025a).

a Assets that fall within the scope of this climate report are shown in green; assets excluded owing to the lack of a standardised methodology are shown in grey The size of the rectangles is proportional to the respective asset volume, based on the accounting valuation used in Banco de España (2025a).

determining each issuer's carbon intensity – normalising their GHG emissions by a measure of their economic activity – before weighting these values by each investor's relative share in the portfolio.

Total GHG emissions quantifies the emissions associated with each portfolio in tonnes of CO_2e. This report presents scope 1 and 2 GHG emissions, in line with previous editions, and for the first time also includes scope 3 emissions for non-sovereign issuers. As an absolute measure without normalisation by volume, the total GHG emissions metric is of limited use for drawing comparisons between portfolios and over time, since it tends to mainly reflect changes in portfolio size.

Carbon footprint measures a portfolio's total volume of GHG emissions relative to its size. It is expressed in tonnes of CO_2e per million euro invested and, like the WACI metric, is useful for comparing portfolios of different sizes and at different points in time.

Similarly, *carbon intensity* quantifies the total volume of GHG emissions, normalised using a measure of economic activity and expressed in tonnes of CO_2e per million euro. It thus calibrates a portfolio's carbon efficiency by normalising the size of each issuer by their revenues.

All of these TCFD-recommended metrics were designed to characterise, from a climate standpoint, investments in assets issued by non-financial and, to a lesser extent, financial corporations. However, these are not typically the predominant asset classes in portfolios managed by NCBs such as the Banco de España, as illustrated in the following sections. Accordingly, these metrics had to be adapted to ensure their applicability to other asset types, such as sovereign bonds.[23]

23 Arranz Gozalo, González Martínez and Luis López (2025).

For instance, in the case of sovereign bonds three approaches were considered for allocating GHG emissions:

a) the *production approach*, under which all GHG emissions produced in a country, including those linked to domestic consumption and exports, are assigned to the sovereign issuer;

b) the *government approach*, which considers the central government's GHG emissions;

c) the *consumption approach*, which includes the GHG emissions produced in the country, correcting for trade effects (emissions assigned to imports are included while those assigned to exports are excluded).

Both the production and consumption approaches lead to a double counting issue and introduce an upward bias in indicators when a portfolio combines sovereign bonds with other securities, since the GHG emissions of non-sovereign agents will also be included in the total emissions produced in the country.

Under the production approach, the data are calculated both including and excluding emissions related to land use, land use change and forestry (LULUCF) (see Box 1 of the 2024 report for more details about these emissions), as can be seen in the corresponding tables.

5.1.1 Euro-denominated portfolios

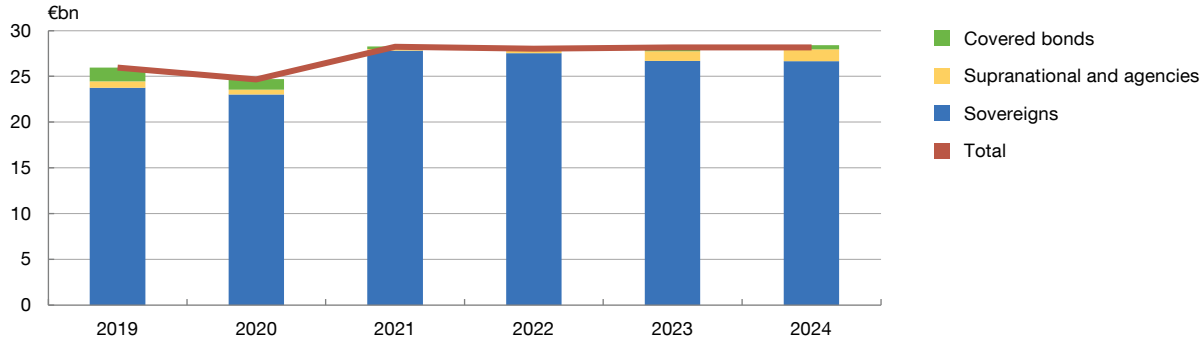
The Banco de España's euro-denominated own portfolios comprise euro-denominated debt securities issued by euro area residents and non-residents that are not held for monetary policy purposes. These portfolios include sovereign bonds, sub-sovereign bonds (issued by regional governments), bonds issued by supranational entities and state agencies, and covered bonds. As Chart 2 shows, sovereign bonds make up the bulk of these portfolios, accounting for 95% of the total at end-2024, unchanged from a year earlier.

Table 1 presents the indicator values for the Banco de España's euro-denominated investment portfolios at end-2024 (the last full year available) applying the various metrics.[24] For the first time, this year's disclosures include total absolute scope 3 emissions for non-sovereign assets. The table also shows the aggregate share of investment in social and sustainable bonds and the share of investment in green bonds by asset type for 2024 (see Annex 3 for previous years). Further details and additional metrics can be found in Section 5.1.3.

24 Table A.1 (Annex 1) sets out the main variables used by type of approach and asset. More details are provided in Annex 2. Box 2 of the 2024 report discusses the data sources for the variables used to calculate the indicators.

Chart 2

Holdings in euro-denominated investment portfolios, 2019-2024 (a)



SOURCE: Banco de España.

a Nominal amounts. The holdings reported are the position at year-end.

Table 1

Main climate-related metrics for euro-denominated investment portfolios at end-2024

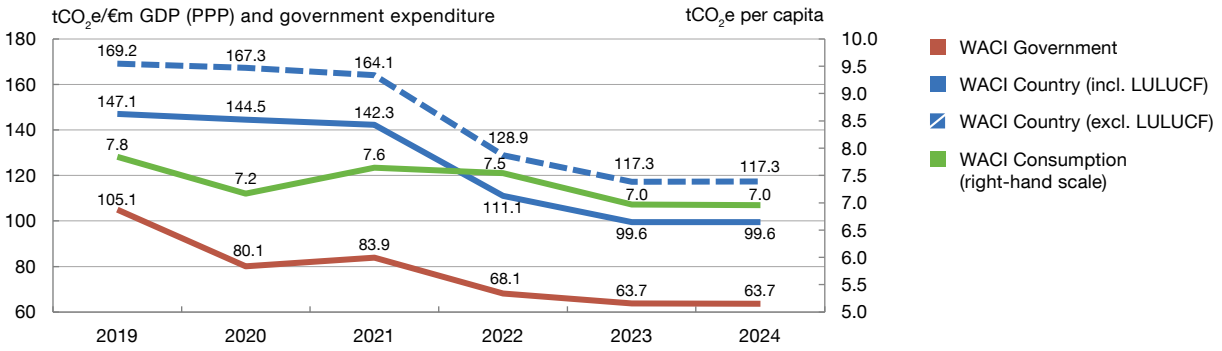
Holdings in euro-denominated own portfolios 2024	Sovereigns (a)				Non-sovereigns		
	Approaches				Total	Supranational and agency bonds	Covered bonds
	Country excl. LULUCF (c)	Country incl. LULUCF (c)	Government	Consumption			
Main metrics							
Portfolio size (€bn)			26.6		1.8	1.3	0.5
WACI (b)	117.3	99.6	63.7	7.0	1.5	1.3	2.0
(tCO_2e/€m GDP (PPP), gov., population, €m revenues)	*100%*	*100%*	*100%*	*100%*	*93%*	*91%*	*100%*
Total absolute emissions	3,123,033	2,650,393	324,883	3,707,492	589	527	62
(Scope 1 and 2 in tCO_2e)	*100%*	*100%*	*100%*	*100%*	*93%*	*91%*	*100%*
(Scope 3 in tCO_2e)					216,899	89,939	126,959
					93%	*91%*	*100%*
Carbon footprint	117.3	99.6	12.2	139.3	0.4	0.4	0.1
(tCO_2e per €m invested)	*100%*	*100%*	*100%*	*100%*	*93%*	*91%*	*100%*
Additional metrics							
Carbon intensity	117.3	99.6	63.6	6.9	3.4	6.8	0.7
(tCO_2e/€m GDP (PPP), revenues)	*100%*	*100%*	*100%*	*100%*	*93%*	*91%*	*100%*
Percentage of green bonds			4.8%		58%	71%	22%
(%)			*100%*		*100%*	*100%*	*100%*
Percentage of social and sustainable bonds			2.4%		11%	15%	—
(%)			*100%*		*100%*	*100%*	*100%*

SOURCE: Banco de España calculations drawing on ISS, C4F, World Bank, EEA and BIS data. Previous years' figures have been updated per the data revisions and the latest information available (see Box 2 of the 2024 report). Information taken from the data providers ISS and C4F which were selected in the joint Eurosystem procurement process, led by the Bundesbank, in 2021-2022. See Deutsche Bundesbank (2022). In December 2024 ISS ceased to provide data on Government issues, as this approach was not included in the PCAF methodology.
NOTE: The percentages in italics beneath the metrics denote the level of data availability. The metrics are calculated using nominal values. The holdings refer to the position at year-end. Holdings in the euro-denominated BISIP fund are included under their respective asset class.

a This asset class includes sovereign and sub-sovereign bonds and bonds issued by public sector entities.
b Weighted average carbon intensity.
c Due to the mathematical construction of the formula for sovereign assets, and under the production approach, when GDP is used as an attribution and normalisation factor the WACI, carbon footprint and carbon intensity metrics yield the same outcome.

Chart 3

WACI according to different approaches: sovereign bonds in euro-denominated portfolios, 2019-2024 (a)



SOURCE: Banco de España calculations, drawing on ISS, C4F, World Bank and EEA data.

a Previous years' figures have been updated per the data revisions and the latest information available (see Box 2 of the 2024 report).

These values are best interpreted from a dual perspective: a time perspective, to better assess how they change over time; and a spatial or geographical perspective, enabling comparison with the portfolios of other leading central banks.

As regards the spatial or geographical perspective, the Eurosystem has worked to create a common disclosure framework which is proving very useful. That said, these portfolios may be subject to different mandates and may vary substantially in terms of composition or size. For instance, the reports published in 2024 showed that the Banco de España portfolios covered by the analysis were among the largest in the Eurosystem, inevitably resulting in a comparatively higher volume of total emissions. However, after correcting for the size effect, the Banco de España's relative emissions are well below the NCB group median, since most assets in its portfolios correspond to low carbon intensity issuers.

Turning to the time perspective, Table A3.1 (Annex 3) reproduces Table 1 for the years 2019-2023. Focusing on the most notable findings, Chart 3 shows WACI metric developments to 2024 for sovereign bonds, which, as indicated above, account for the bulk of the euro-denominated investment portfolios. Leaving aside the pandemic year (2020),[25] the three versions of this indicator declined during the period analysed, reflecting a gradual improvement in portfolio climate-related quality. Similarly, all of the available approaches for allocating emissions to sovereign debt show a decrease in relative emissions. However, that decrease is more gradual under the consumption approach, primarily owing to the population (which under this approach is considered relative to GHG emissions) being far more stable over time than the macroeconomic variables (GDP or government expenditure) used in the other approaches.

25 2020 was the worst year of the COVID-19 pandemic, which had a singular and atypical impact on both economic and GHG emissions indicators.

Importantly, the data for the most recent year (2024 in the case of this report) are subject to a significant limitation due to a lack of information. More specifically, while the composition of the portfolios corresponds to the most recent year, the emissions data available are for the immediately preceding year (see Box 2 of the 2024 report for a description of the methodology). Thus, the changes between 2023 and 2024 exclusively reflect developments in portfolio size and composition, without capturing changes in issuers' GHG emissions.

Chart 4 shows the changes in absolute carbon emissions (Chart 4.a), the carbon footprint (Chart 4.b) and carbon intensity (Chart 4.c) for sovereign bonds. In this case, however, only the results under the production approach including LULUCF emission data are shown. By construction, the carbon footprint and carbon intensity metrics yield the same figure.

The trajectory of total GHG emissions essentially reflects changes in portfolio size. As indicated above, this limits its usefulness for analysis purposes. The relative metrics, such as carbon footprint or carbon intensity, which correct this size effect (like WACI), improved as compared with the start of the period analysed (stripping out the pandemic year). This echoes the conclusion drawn from Chart 3, showing steady progress towards a portfolio more in line with the climate goals.

5.1.2 Non-euro-denominated portfolios

The Banco de España independently manages foreign reserves that have not been transferred to the ECB. These reserves consist of debt securities issued by euro area and non-euro area residents denominated in US dollars, Canadian dollars, pound sterling, yen[26] and Chinese renminbi.[27] These portfolios include current accounts, deposits, sovereign bonds, sub-sovereign bonds (issued by regional governments), bonds issued by supranational entities and state agencies, and covered bonds, as well as other foreign currency assets.

The climate metrics are calculated taking into account positions in sovereign and sub-sovereign bonds, bonds issued by supranational entities and agencies, and covered bonds. However, the calculation excludes cash and cash equivalents and derivatives since, as mentioned above, there is no standardised methodology for measuring the emissions associated with these products. As a result, the totals presented in this report (Chart 5) do not reflect the size of the respective portfolios but are instead influenced by changes in portfolio composition, such as a shift towards asset classes that fall within the scope of this report. This effect was clearly evident between 2022 and 2023. In terms of composition, at end-2024 sovereign bonds accounted for 88% of the reported assets included in the chart.

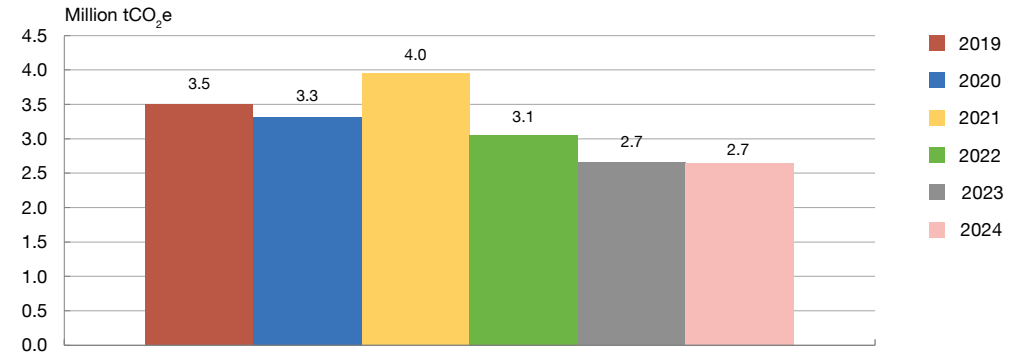
Table 2 presents the values of the different indicators obtained by applying the metrics described to the assets reported for the Banco de España's non-euro-denominated investment portfolios

26 The exchange rate risk on yen-denominated investments is hedged by swap transactions (mainly against the US dollar).
27 Banco de España (2025a).

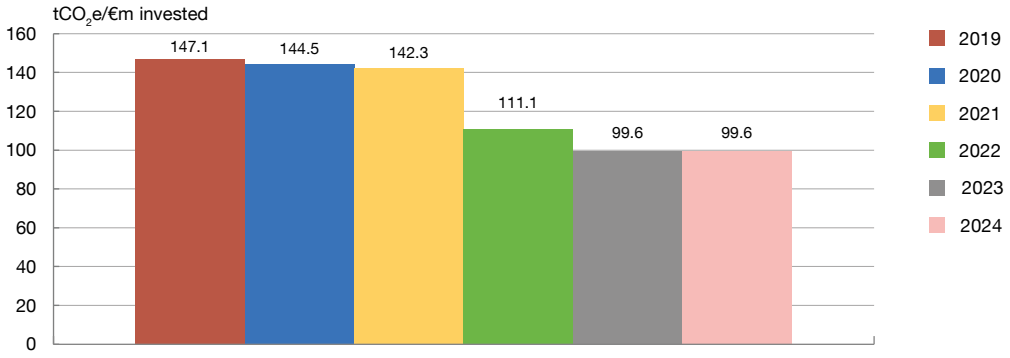
Chart 4

Metrics for sovereign bonds in euro-denominated portfolios, 2019-2024: production approach, including LULUCF emissions (a)

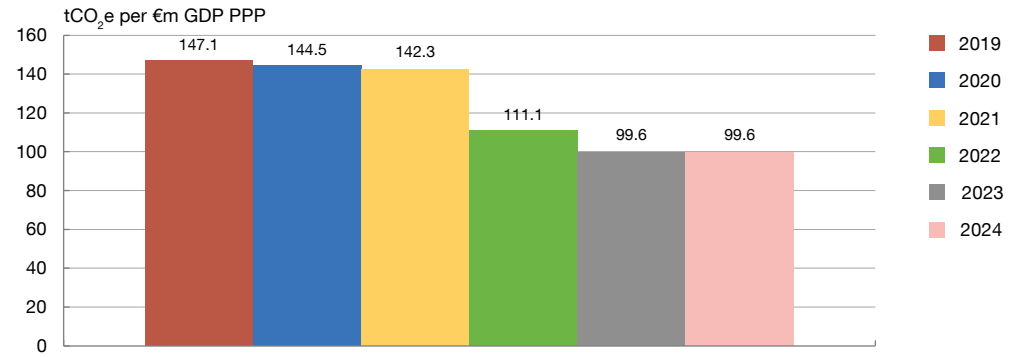
4.a Absolute emissions



4.b Carbon footprint



4.c Carbon intensity

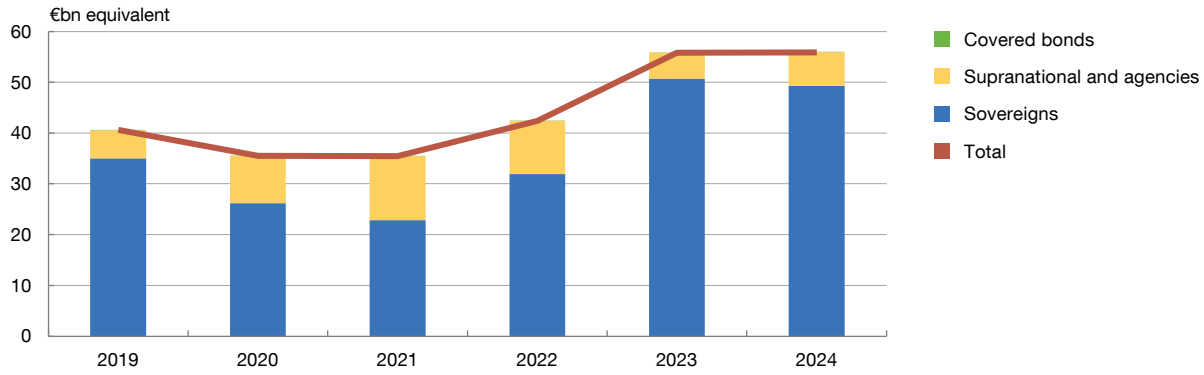


SOURCE: Banco de España calculations, drawing on ISS, World Bank and EEA data.

a Previous years' figures have been updated per the data revisions and the latest information available (see Box 2 of the 2024 report).

Chart 5

Holdings in non-euro-denominated investment portfolios, 2019-2024 (a)



SOURCE: Banco de España.

a Nominal amounts. The holdings reported are the position at year-end.

Table 2

Main climate-related metrics for non-euro-denominated investment portfolios at end-2024

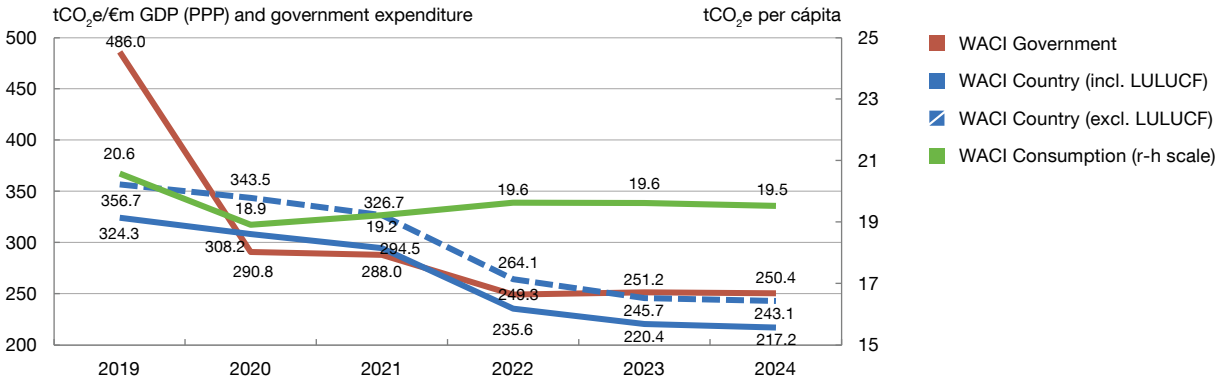
Holdings in non-euro-denominated own portfolios, 2024	Sovereigns (a)				Non-sovereigns		
	Approaches						
	Country (excl. LULUCF) (c)	Country (incl. LULUCF) (c)	Government	Consumption	Total	Supranational and agency bonds	Covered bonds
Main metrics							
Portfolio size (€bn eq)		49.3			6.6	6.6	0.001
WACI (b)	243.1	217.2	250.4	19.5	0.4	0.4	0.3
(tCO_2e/€m GDP (PPP), gov. exp., population, €m revenues)	*100%*	*100%*	*100%*	*100%*	*77%*	*77%*	*100%*
Total absolute emissions	11,977,144	10,701,941	1,732,893	13,233,879	137	137	0.1
(Scope 1 and 2 in tCO_2e)	*100%*	*100%*	*100%*	*100%*	*74%*	*74%*	*100%*
(Scope 3 in tCO_2e)					372,306	371,810	496
					74%	*74%*	*100%*
Carbon footprint	243.1	217.2	35.2	268.6	0.03	0.03	0.1
(tCO_2e per €m eq. invested)	*100%*	*100%*	*100%*	*100%*	*74%*	*74%*	*100%*
Additional metrics							
Carbon intensity	243.1	217.2	239.1	18.9	0.5	0.5	0.3
(tCO_2e/€m GDP (PPP), revenues)	*100%*	*100%*	*100%*	*100%*	*74%*	*74%*	*100%*
Percentage of green bonds		0.9%			*27%*	*27%*	*100%*
(%)		*100%*			*100%*	*100%*	*100%*
Percentage of social and sustainable bonds		—			*15%*	*15%*	—
(%)		*100%*			*100%*	*100%*	*100%*

SOURCE: Banco de España calculations drawing on ISS, C4F, World Bank and BIS data. Previous years' figures have been updated per the data revisions and the latest information available (see Box 2 of the 2024 report). Information taken from the data providers ISS and C4F which were selected in the joint Eurosystem procurement process, led by the Bundesbank, in 2021-2022. See Deutsche Bundesbank (2022). In December 2024 ISS ceased to provide data on Government issues, as this approach was not included in the PCAF methodology.
NOTE: The percentages in italics beneath the metrics denote the level of data availability. The metrics are calculated using nominal values. The holdings reported are the position at each year-end. Holdings in the US dollar-denominated BISIP fund are included under their respective asset class.

a This asset class includes sovereign and sub-sovereign bonds and bonds issued by public sector entities.
b Weighted average carbon intensity.
c As a result of the mathematical construction of the formula for sovereign assets, under the production approach, when GDP is used as an attribution and normalisation factor, the WACI, carbon footprint and carbon intensity metrics lead to the same outcome.

Chart 6

WACI according to different approaches: sovereign bonds in non-euro-denominated portfolios, 2019-2024 (a)



SOURCE: Banco de España calculations drawing on ISS, C4F and World Bank data.

a Previous years' figures have been updated per the data revisions and the latest information available (see Box 2 of the 2024 report).

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at end-2024.[28] For the first time, information is provided this year on the total absolute scope 3 emissions for non-sovereign assets. This table also shows the aggregate share of investment in social and sustainable bonds and the breakdown of the proportion of investment in green bonds by asset type for 2024 (see Annex 4 for previous years). More details are provided in Section 5.1.3 with additional metrics.

Annex 4 presents Table 2 for the years 2019-2023, showing how the indicators have changed over time. Focusing on the most notable findings, Chart 6 shows how the WACI metric has evolved for sovereign bonds which, as indicated above, account for the bulk of the non-euro-denominated investment portfolios. As can be seen, leaving aside 2020, the worst year of the COVID-19 pandemic, the three versions of this indicator decreased in the period analysed (from 2019 onwards), reflecting a gradual improvement in portfolio climate-related quality. As in the case of the euro-denominated portfolios, the consumption approach shows a more gradual decline than the other approaches, since the population (which is analysed relative to consumption GHG emissions), is far more stable over time than GDP or government expenditure.

Charts 7.a, 7.b and 7.c show the changes in absolute carbon emissions, the carbon footprint and carbon intensity, respectively, for sovereign bonds. Only the results based on the production approach, including LULUCF emissions, are shown. Once again for construction reasons, under the production approach the carbon footprint and carbon intensity metrics yield the same figure.

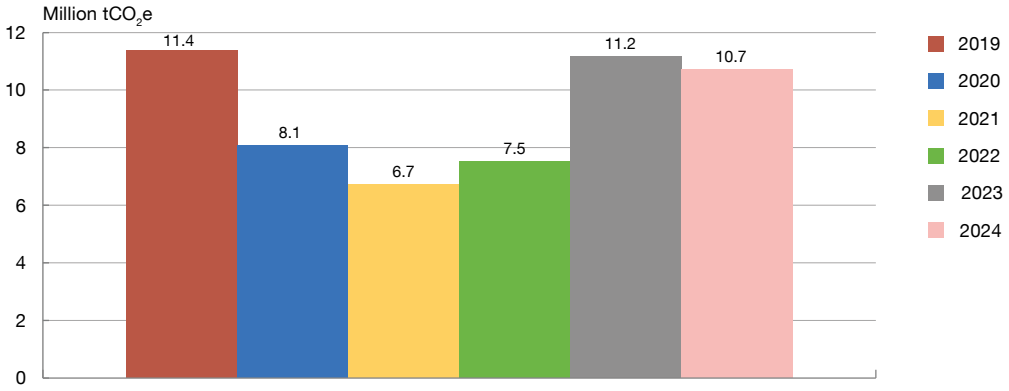
The trajectory of total GHG emissions essentially reflects the changes in the volume of reported assets. As indicated above, this limits its usefulness for the purposes of analysis as its changes

28 Figure A1.1 (Annex 1) sets out the main variables used by type of approach and asset. More details are provided in Annex 2. Box 2 of the 2024 report discusses the data sources of the variables used to calculate the indicators.

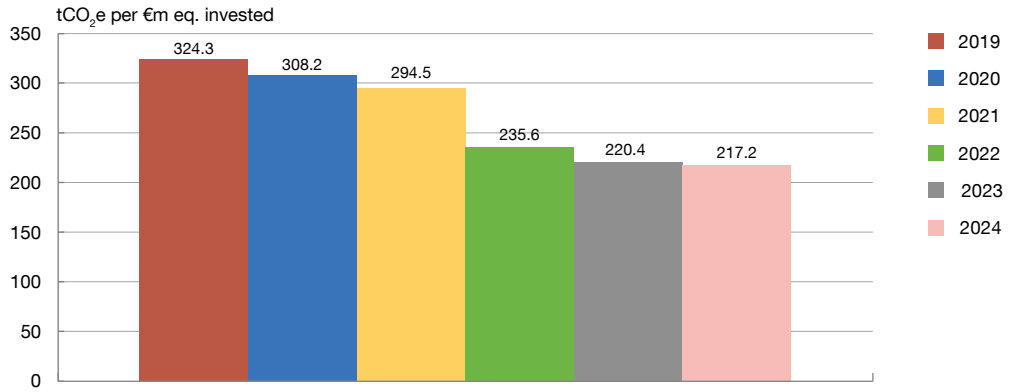
Chart 7

Metrics for sovereign bonds in non-euro-denominated portfolios, 2019-2024: production approach, including LULUCF emissions (a)

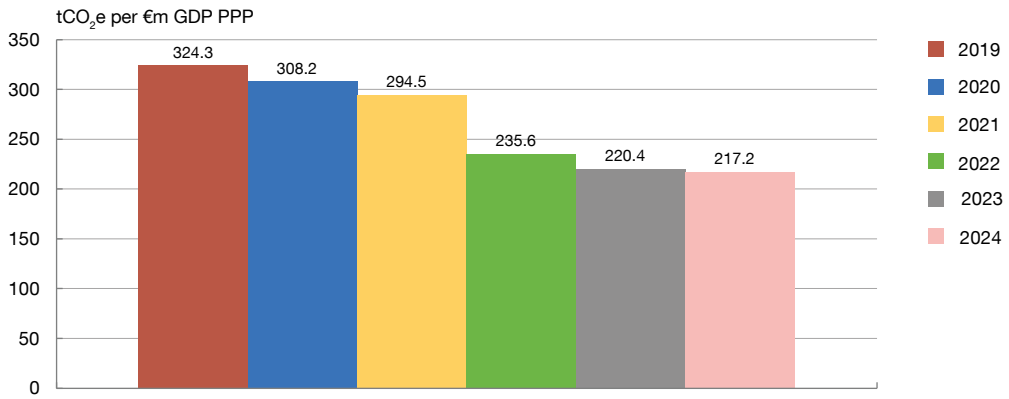
7.a Absolute emissions



7.b Carbon footprint



7.c Carbon intensity

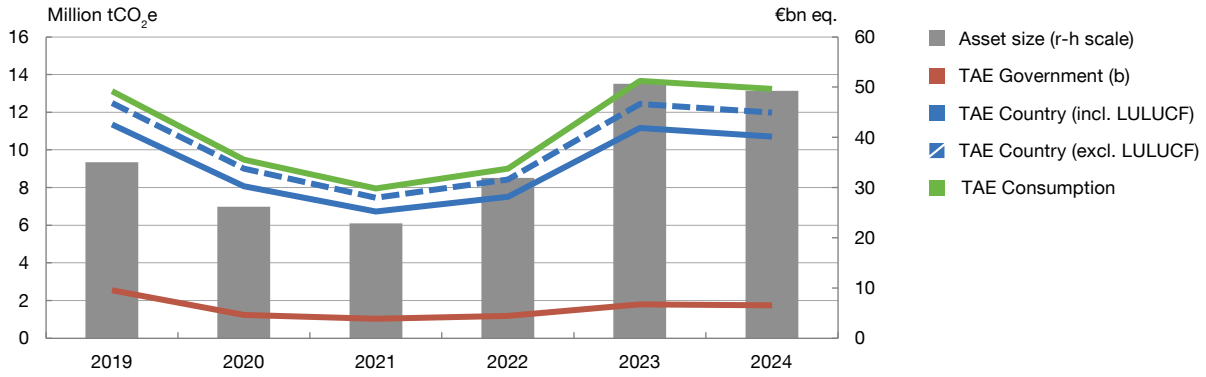


SOURCE: Banco de España calculations drawing on ISS and World Bank data.

a Previous years' figures have been updated per the data revisions and the latest information available (see Box 2 of the 2024 report).

Chart 8

Absolute emissions and size of sovereign assets in non-euro-denominated portfolios (a)



SOURCE: Banco de España calculations drawing on ISS, C4F and World Bank data.

a Nominal values for sovereign assets. Holdings refer to the position at year-end.
b TAE: total absolute emissions.

are determined by the effect of portfolio size mentioned at the start of this section. This can be seen more clearly in Chart 8. Like the WACI metric, the relative metrics (such as carbon footprint or carbon intensity), which correct this size effect, improved compared with the start of the period under analysis. Similarly, both indicators declined in the period analysed (from 2019 onwards). This echoes the conclusion drawn from Chart 6, showing steady progress towards a portfolio more in line with the climate goals.

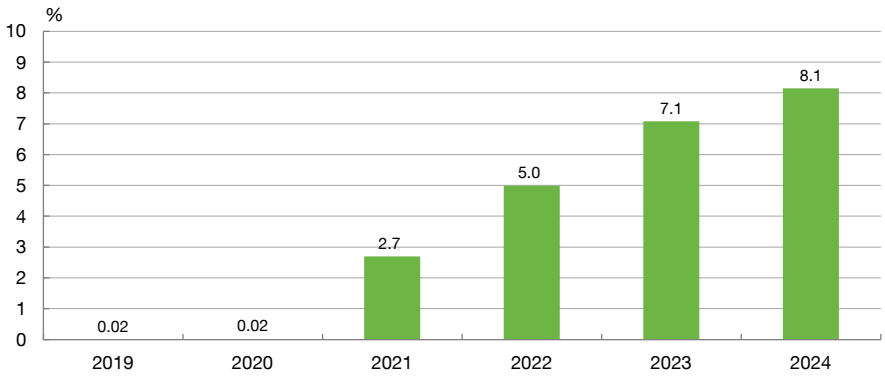
5.1.3 Investment in green bonds

Although Sections 5.1.1 and 5.1.2 already include information on the proportion of both euro and non-euro-denominated portfolios invested in green bonds in 2024 (see Tables 1 and 2, respectively), further details are provided below on these assets, using specific metrics.

Charts 9 and 10 show how the relative weight of green bond investments in the Banco de España's euro and non-euro-denominated own portfolios has continued to grow since 2019 as a result of the impact investment strategy adopted (see Section 3). Once again, analysis of this indicator suggests that the portfolio is increasingly aligned with the goals pursued.

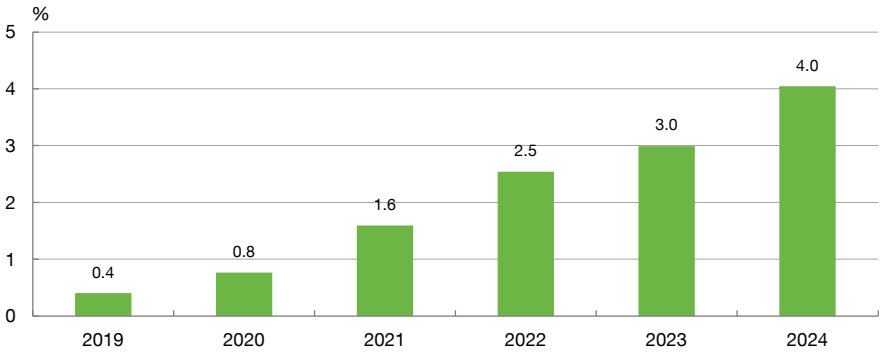
Another relatively common way to measure the environmental impact of investment in green bonds is by estimating "avoided emissions": investment in green bonds translates into funding for renewable energy and energy efficiency projects, among others, which can be seen as one way of reducing GHG emissions, measured in tonnes of CO2e avoided. The BIS compiles this indicator for its green investment funds as an estimation of the annual impact expected of the projects financed using the funds raised by the green bonds once they are at their expected

Chart 9
Green investment as a percentage of the holdings in euro-denominated investment portfolios



SOURCE: Banco de España calculations.

Chart 10
Green investment as a percentage of the holdings in non-euro-denominated investment portfolios



SOURCE: Banco de España calculations.

operating capacity in normal conditions, based on the data provided by the issuers of the green bonds in the investment fund portfolio.

As Table 3 shows, the estimated environmental impact attributable to the Banco de España's holding in the euro-denominated BIS fund at end-September 2024 was 205,800 tonnes of CO2e avoided annually. Renewable energy was the main contributor to this total, with an estimated 80,328 tonnes of CO2e avoided annually, followed by energy efficiency projects (28% of the estimated avoided emissions), clean transport (28%) and biodiversity, sustainable land use, green buildings and waste management (4% combined) (Chart 11). The environmental impact of these estimated avoided CO2e emissions is equivalent to slightly more than 480,000 barrels of oil consumed annually, more than 48,000 cars driven for a year, more

Table 3
Additional metrics relating to indirect holdings of euro and US dollar-denominated green bonds

	2020	2021	2022	2023	2024
Avoided emissions euro-denominated BISIP fund (tCO_2e) (a)		151,437	393,594	299,670	205,800
		95%	*96%*	*84%*	*90%*
Avoided emissions US dollar-denominated BISIP fund (tCO_2e) (a)	69,856	65,175	43,286	48,307	46,628
	100%	*94%*	*95%*	*83%*	*81%*

SOURCE: Banco de España calculations drawing on the aggregated data provided by the BIS.
NOTE: The percentages in italics beneath the metrics denote the level of data availability. Previous years' figures have been updated per the data revisions.

a Annual avoided emissions estimated for each fund, attributed based on the holding therein. Data at end-September each year.

Chart 11
Environmental impact of the estimated avoided GHG emissions by project type, as a percentage. Euro-denominated BISIP (2024) (a)

SOURCE: Banco de España calculations, drawing on aggregate data provided by the BIS.

a Annual avoided emissions estimated for the euro-denominated fund, attributed based on the holding therein. Data as at end-September 2024.

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than 11 billion smartphones charged or the electricity used by nearly 35,000 households in a year.

As Table 3 also shows, the estimated environmental impact attributable to the Banco de España's holding in the US dollar-denominated BIS fund at end-September 2024 was 46,628 tonnes of CO2e avoided annually. Renewable energy was the main contributor to this total, with an estimated 30,656 tonnes of CO2e avoided annually, followed by energy efficiency projects (over 11% of the estimated avoided emissions), clean transport (11%), sustainable land use (5%) and biodiversity, green buildings and waste management (7% combined) (Chart 12). The environmental impact of these estimated avoided CO2e emissions is equivalent to slightly more than 100,000 barrels of oil consumed annually, more than 11,000 cars driven for a year, more than 2 billion smartphones charged or the electricity used by more than 7,000 households in a year.

Chart 12

Environmental impact of the estimated avoided GHG emissions by project type, as a percentage. US dollar-denominated BISIP (2024) (a)

FUENTE: Banco de España calculations, drawing on aggregate data provided by the BIS.

a Annual avoided emissions estimated for the US dollar-denominated fund, attributed based on the holding therein. Data as at end-September 2024.

Table 4

Additional metrics relating to direct investment in green bonds (a)

	2024
Avoided emissions of direct investment in green bonds (tCO_2e)	1,234,417
	71%

SOURCE: Banco de España calculations, drawing on the aggregated data provided by the Luxembourg Green Exchange (LGX) by Luxembourg Stock Exchange.
NOTE: The percentages in italics beneath the metrics denote the level of data availability.

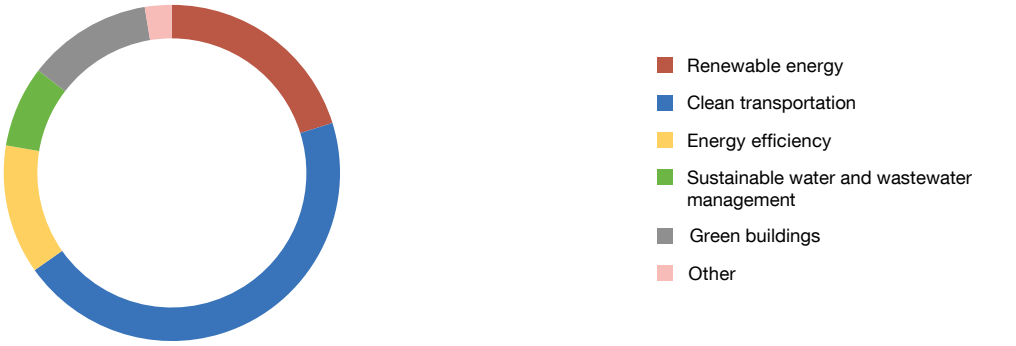
a Data at end-March 2024.

The annual avoided emissions attributable to the Banco de España's investment in these funds varies over time depending on changes in two components: the emissions avoided per fund participation unit and the Banco de España's overall holdings in the fund. The second factor remained unchanged in 2024, and the changes in emissions avoided are therefore entirely down to the first factor (which, in any event, accounts for most of the changes to this indicator over the entire period considered).

Turning to direct investments in green bonds in the SRI portfolio, Table 4 shows that the estimated environmental impact attributable to the Banco de España's holdings at end-March 2024 was 1,234,417 tonnes of CO2e avoided annually. Of the projects financed by these green bonds, clean transport was the greatest contributor, accounting for 45% of the total, followed by renewable energy projects (20%), energy efficiency and green buildings (each 12%), sustainable water and wastewater management (8%) and other projects such as natural resources and land use, climate change adaptation and pollution prevention and control, among others (3% combined) (Chart 13).

Chart 13

Environmental impact of the estimated avoided GHG emissions by project type, as a percentage. Direct investment in green bonds (2024) (a)



SOURCE: Banco de España calculations, drawing on data from the Luxembourg Green Exchange (LGX) by Luxembourg Stock Exchange.

Figure 3

Equivalencies of the environmental impact of estimated avoided GHG emissions. Direct investment in green bonds (2024)

SOURCE: Banco de España calculations, drawing on data from the Luxembourg Green Exchange (LGX) by Luxembourg Stock Exchange and the United States Environmental Protection Agency (EPA) Greenhouse Gas Equivalencies Calculator.

As Figure 3 shows, the environmental impact of these estimated avoided CO2e emissions is equivalent to slightly more than 2.5 million barrels of oil consumed annually, more than 260,000 cars driven for a year, more than 90 billion smartphones charged or the energy consumed by more than 150,000 households in a year. The estimated avoided CO2e emissions are equivalent

to those avoided by more than 395,000 tonnes of waste recycled or more than 300 wind turbines functioning in a year. Also, the projects financed by green bonds contribute to achieving the United Nation's Sustainable Development Goals (SDGs). See Box 1 for further details on the SDGs relating to the Banco de España's direct investment in green bonds.

5.2 Targets

Long term, the Banco de España remains firmly committed to decarbonising its euro and non-euro-denominated investment portfolios, to make them carbon neutral by 2050. This will be in line with the Paris Agreement goals and with the carbon neutral commitment set out in the European Climate Law, which aims for Europe's economy and society to become climate-neutral by 2050.

Given the high proportion of sovereign bonds in the Banco de España's portfolios, this will also largely depend on the pace at which the decarbonisation process develops in the relevant issuing countries.

As progress is made in the development and understanding of indicators that enable long-term goals to be set, shorter-term interim goals will be designed. These will be based on specific metrics, such as an increase in the relative weight of the SRI portfolios, in line with the investment strategy described in Section 3.

Annex 1 Variables by approach and asset type

Figure A1.1
Variables by approach and asset type

	Sovereign and sub-sovereign bonds			Supranational entities and state agencies	Covered bonds
	Approach				
	Country	Government	Consumption		
GHG emissions allocation (scopes 1 and 2, and scope 3)	Emissions produced within a country's physical borders, including domestic consumption and exports Excluding and including LULUCF GHG emissions	Central government's direct and indirect emissions	Domestic demand emissions, taking into account trade effects (including imports and excluding exports)	GHG emissions	
Normalisation	GDP (PPP)	Central government final consumption expenditure	Population	Revenue	
Attribution	GDP (PPP)			EVIC	

SOURCE: Banco de España.

Annex 2 Metrics and variables

Table A2.1
Description of main metrics

Metric	Formula
Weighted average carbon intensity (WACI) in tCO_2e/€m revenues, GDP (PPP), gov. expenditure or per capita)	$WACI = \sum_n^i \left(\frac{\text{investment value}_i}{\text{current portfolio value}} \times \frac{\text{GHG emissions}_i}{\text{revenues, GDP (PPP)}_i, \text{gov. expend.}_i \text{ or population}_i} \right)$
Total absolute emissions (scope 1 and 2 in tCO_2e and scope 3 in tCO_2e)	$\text{Total absolute emissions} = \sum_n^i \left(\frac{\text{investment value}_i}{\text{GDP (PPP)}_i \text{ or EVIC}_i} \times \text{GHG emissions}_i \right)$
Carbon footprint (tCO_2e per €m invested)	$\text{Carbon footprint} = \frac{\sum_n^i \left(\frac{\text{investment value}_i}{\text{GDP (PPP)}_i \text{ or EVIC}_i} \times \text{GHG emissions}_i \right)}{\text{current portfolio value}}$
Carbon intensity (in tCO_2e/€m revenues, GDP (PPP), gov. expenditure or per capita)	$\text{Carbon intensity} = \frac{\sum_n^i \left(\frac{\text{investment value}_i}{\text{GDP (PPP)}_i \text{ or EVIC}_i} \times \text{GHG emissions}_i \right)}{\sum_n^i \left(\frac{\text{investment value}_i}{\text{GDP (PPP)}_i \text{ or EVIC}_i} \times \text{revenues}_i, \text{GDP (PPP)}_i, \text{gov. expend.}_i \text{ or population}_i \right)}$

SOURCE: Banco de España.

Table A2.2
Carbon emissions by type of issuer

Type of issuer	Sovereigns and sub-sovereigns	Supranational & agencies	Covered bonds
Factor	i) Country emissions, production approach (excluding and including LULUCF) ii) Government sector emissions iii) Country emissions, consumption approach	Scope 1 and 2 emissions Scope 3 emissions	Scope 1 and 2 emissions Scope 3 emissions

SOURCE: Banco de España.

Table A2.3
Normalisation factors by asset type

Type of issuer	Sovereigns and sub-sovereigns	Supranational & agencies	Covered bonds
Factor	i) GDP (PPP adjusted) ii) Central government final consumption expenditure iii) Population	Revenue	Revenue

SOURCE: Banco de España.

Table A2.4
Attribution factors by asset type

Type of issuer	Sovereigns and sub-sovereigns	Supranational & agencies	Covered bonds
Factor	GDP (PPP adjusted)	Enterprise value including cash (EVIC)	Enterprise value including cash (EVIC)

SOURCE: Banco de España.

Annex 3 Main metrics of euro-denominated investment portfolios, 2019-2023

Table A3.1
Main metrics of euro-denominated investment portfolios, 2019-2023

Holdings in euro-denominated own portfolios, 2023	Sovereigns (a)				Non-sovereigns		
	Approaches				Total	Supranational and agency bonds	Covered bonds
	Country excl. LULUCF (c)	Country incl. LULUCF (c)	Government	Consumption			
Main metrics							
Portfolio size (€bn)		26.7			1.5	1.1	0.4
WACI (b)	117.3	99.6	63.7	7.0	1.5	1.2	2.3
(tCO_2e/€m GDP (PPP), gov. expend., pop., €m revenue)	*100%*	*100%*	*100%*	*100%*	*94%*	*92%*	*100%*
Total absolute emissions	3,126,102	2,653,852	325,222	3,713,841	467	405	61
(scope 1 and 2 in tCO_2e)	*100%*	*100%*	*100%*	*100%*	*94%*	*91%*	*100%*
(scope 3 in tCO_2e)					188,094	73,593	114,501
					94%	*91%*	*100%*
Carbon footprint	117.3	99.6	12.2	139.3	0.3	0.4	0.2
(tCO_2e per €m invested)	*100%*	*100%*	*100%*	*100%*	*94%*	*91%*	*100%*
Additional metrics							
Carbon intensity	117.3	99.6	63.6	6.9	3.2	6.6	0.7
(tCO_2e/€m GDP (PPP), revenues)	*100%*	*100%*	*100%*	*100%*	*94%*	*91%*	*100%*
Percentage of green bonds		4.5%			54%	64%	25%
(%)		*100 %*			*100%*	*100%*	*100%*
Percentage of social and sustainable bonds		2.4%			14%	19%	—
(%)		*100%*			*100%*	*100%*	*100%*

Holdings in euro-denominated own portfolios, 2022	Sovereigns (a)				Non-sovereigns		
	Approaches				Total	Supranational and agency bonds	Covered bonds
	Country excl. LULUCF (c)	Country incl. LULUCF (c)	Government	Consumption			
Main metrics							
Portfolio size (€bn)		27.5			0.5	0.4	0.1
WACI (b)	128.9	111.1	68.1	7.5	2.4	2.6	1.1
(tCO_2e/€m GDP (PPP), gov. expend., pop., €m revenue)	*100%*	*100%*	*100%*	*100%*	*73%*	*81%*	*41%*
Total absolute emissions	3,546,018	3,055,316	369,449	4,220,671	231	221	10
(scope 1 and 2 in tCO_2e)	*100%*	*100%*	*100%*	*100%*	*73%*	*81%*	*41%*
(scope 3 in tCO_2e)					16,479	10,131	6,348
					73%	*81%*	*41%*
Carbon footprint	128.9	111.1	13.4	153.4	0.7	0.70	0.3
(tCO_2e per €m invested)	*100%*	*100%*	*100%*	*100%*	*73%*	*81%*	*41%*
Additional metrics							
Carbon intensity	128.9	111.1	68.1	7.5	12.4	21.9	1.2
(tCO_2e/€m GDP (PPP), revenues)	*100%*	*100%*	*100%*	*100%*	*73%*	*81%*	*41%*
Percentage of green bonds		3.6%			87%	100%	30%
(%)		*100%*			*100%*	*100%*	*100%*
Percentage of social and sustainable bonds		1.9%			—	—	—
(%)		*100%*			*100%*	*100%*	*100%*

FUENTE: Banco de España calculations, drawing on ISS, C4F, World Bank, EEA and BIS data. Previous years' figures have been updated per the data revisions and the latest information available (see Box 2 of the 2024 report).
NOTE: The percentages in italics beneath the metrics denote the level of data availability. The metrics are calculated using nominal values. The holdings refer to the position at each year-end. Holdings in the euro-denominated BISIP fund are included under their respective asset class.

a This asset class includes sovereign and sub-sovereign bonds and bonds issued by public sector entities.
b Weighted average carbon intensity.
c Due to the mathematical construction of the formula for sovereign assets, and under the production approach, when GDP is used as an attribution and normalisation factor the WACI, carbon footprint and carbon intensity metrics yield the same outcome.

Table A3.1

Main metrics of euro-denominated investment portfolios, 2019-2023 (cont'd)

Holdings in euro-denominated own portfolios, 2021	Sovereigns (a)				Non-sovereigns		
	Approaches						
	Country excl. LULUCF (c)	Country incl. LULUCF (c)	Government	Consumption	Total	Supranational and agency bonds	Covered bonds
Main metrics							
Portfolio size (€bn)		27.8			0.5	0.2	0.3
WACI (b)	164.1	142.3	83.9	7.6	1.5	1.5	1.6
(tCO_2e/€m GDP (PPP), gov. expend., pop., €m revenue)	*100%*	*100%*	*100%*	*100%*	*44%*	*74%*	*22%*
Total absolute emissions	4,557,315	3,952,719	479,236	5,497,949	32	5	27
(scope 1 and 2 in tCO_2e)	*100%*	*100%*	*100%*	*100%*	*44%*	*74%*	*22%*
(scope 3 in tCO_2e)					14,554	1,463	13,091
					44%	*74%*	*22%*
Carbon footprint	164.1	142.3	17.3	198.0	0.2	0.03	0.5
(tCO_2e per €m invested)	*100%*	*100%*	*100%*	*100%*	*44%*	*74%*	*22%*
Additional metrics							
Carbon intensity	164.1	142.3	83.8	7.6	1.7	1.1	1.9
(tCO_2e/€m GDP (PPP), revenues)	*100%*	*100%*	*100%*	*100%*	*44%*	*74%*	*22%*
Percentage of green bonds		2.0%			43%	100%	—
(%)		*100%*			*100%*	*100%*	*100%*
Percentage of social and sustainable bonds		1.9%			—	—	—
(%)		*100%*			*100%*	*100%*	*100%*

Holdings in euro-denominated own portfolios, 2020	Sovereigns (a)				Non-sovereigns		
	Approaches						
	Country excl. LULUCF (c)	Country incl. LULUCF (c)	Government	Consumption	Total	Supranational and agency bonds	Covered bonds
Main metrics							
Portfolio size (€bn)		23.0			1.7	0.5	1.2
WACI (b)	167.3	144.5	80.1	7.2	1.3	—	1.3
(tCO_2e/€m GDP (PPP), gov. expend., pop., €m revenue)	*100%*	*100%*	*100%*	*100%*	*7%*	—	*10%*
Total absolute emissions	3,847,069	3,322,115	394,287	4,584,721	39	—	39
(scope 1 and 2 in tCO_2e)	*100%*	*100%*	*100%*	*100%*	*7%*	—	*10%*
(scope 3 in tCO_2e)					9,097	—	9,097
					7%	—	*10%*
Carbon footprint	167.3	144.5	17.1	199.4	0.3	—	0.3
(tCO_2e per €m invested)	*100%*	*100%*	*100%*	*100%*	*7%*	—	*10%*
Additional metrics							
Carbon intensity	167.3	144.5	80.1	7.1	1.4	—	1.4
(tCO_2e/€m GDP (PPP), revenues)	*100%*	*100%*	*100%*	*100%*	*7%*	—	*10%*
Percentage of green bonds		0.02%			—	—	—
(%)		*100%*			*100%*	*100%*	*100%*
Percentage of social and sustainable bonds		—			—	—	—
(%)		*100%*			*100%*	*100%*	*100%*

SOURCE: Banco de España calculations, drawing on ISS, C4F, World Bank, EEA and BIS data. Previous years' figures have been updated per the data revisions and the latest information available (see Box 2 of the 2024 report).
NOTE: The percentages in italics beneath the metrics denote the level of data availability. The metrics are calculated using nominal values. The holdings refer to the position at each year-end. Holdings in the euro-denominated BISIP fund are included under their respective asset class.

a This asset class includes sovereign and sub-sovereign bonds and bonds issued by public sector entities.
b Weighted average carbon intensity.
c Due to the mathematical construction of the formula for sovereign assets, and under the production approach, when GDP is used as an attribution and normalisation factor the WACI, carbon footprint and carbon intensity metrics yield the same outcome.

Table A3.1

Main metrics of euro-denominated investment portfolios, 2019-2023 (cont'd)

Holdings in euro-denominated own portfolios, 2019	Sovereigns (a)				Non-sovereigns		
	Approaches				Total	Supranational and agency bonds	Covered bonds
	Country excl. LULUCF (c)	Country incl. LULUCF (c)	Government	Consumption			
Main metrics							
Portfolio size (€bn)		23.8			2.2	0.7	1.5
WACI (b)	169.2	147.1	105.1	7.8	5.0	—	5.0
(tCO_2e/€m GDP (PPP), gov. expend., pop., €m revenue)	*100%*	*100%*	*100%*	*100%*	*7%*	—	*11%*
Total absolute emissions	4,019,337	3,494,503	465,908	4,646,636	249	—	249
(scope 1 and 2 in tCO_2e)	*100%*	*100%*	*100%*	*100%*	*7%*	—	*11%*
(scope 3 in tCO_2e)					991	—	991
					7%	—	*11%*
Carbon footprint	169.2	147.1	19.6	195.6	1.5	—	1.5
(tCO_2e per €m invested)	*100%*	*100%*	*100%*	*100%*	*7%*	—	*11%*
Additional metrics							
Carbon intensity	169.2	147.1	105.0	7.8	5.1	—	5.1
(tCO_2e/€m GDP (PPP), revenues)	*100%*	*100%*	*100%*	*100%*	*7%*	—	*11%*
Percentage of green bonds		0.02 %			—	—	—
(%)		*100%*			*100%*	*100%*	*100%*
Percentage of social and sustainable bonds		—			—	—	—
(%)		*100%*			*100%*	*100%*	*100%*

SOURCE: Banco de España calculations, drawing on ISS, C4F, World Bank, EEA and BIS data. Previous years' figures have been updated per the data revisions and the latest information available (see Box 2 of the 2024 report).
NOTE: The percentages in italics beneath the metrics denote the level of data availability. The metrics are calculated using nominal values. The holdings refer to the position at each year-end. Holdings in the euro-denominated BISIP fund are included under their respective asset class.

a This asset class includes sovereign and sub-sovereign bonds and bonds issued by public sector entities.
b Weighted average carbon intensity.
c Due to the mathematical construction of the formula for sovereign assets, and under the production approach, when GDP is used as an attribution and normalisation factor the WACI, carbon footprint and carbon intensity metrics yield the same outcome.

Annex 4 Main metrics of non-euro-denominated investment portfolios, 2019-2023

Table A4.1
Main metrics of non-euro-denominated investment portfolios, 2019-2023

Holdings in non-euro-denominated own portfolios, 2023	Sovereigns (a)				Non-sovereigns		
	Approaches				Total	Supranational and agency bonds	Covered bonds
	Country excl. LULUCF (c)	Country incl. LULUCF (c)	Government	Consumption			
Main metrics							
Portfolio size (€bn eq)			50.7		5.1	5.1	0.001
WACI (b)	245.7	220.4	251.2	19.6	0.4	0.4	0.3
(tCO_2e/€m GDP (PPP), gov. expend., pop., €m revenue)	*100%*	*100%*	*100%*	*100%*	*84%*	*84%*	*100%*
Total absolute emissions	12,447,962	11,164,264	1,794,887	13,667,337	103	103	0.1
(scope 1 and 2 in tCO_2e)	*100%*	*100%*	*100%*	*100%*	*82%*	*82%*	*100%*
(scope 3 in tCO_2e)					358,146	357,849	297
					82%	*82%*	*100%*
Carbon footprint	245.7	220.4	35.4	269.8	0.02	0.02	0.1
(tCO_2e per €m eq invested)	*100%*	*100%*	*100%*	*100%*	*82%*	*82%*	*100%*
Additional metrics							
Carbon intensity	245.7	220.4	240.3	19.0	0.5	0.5	0.3
(tCO_2e/€m GDP (PPP), revenues)	*100%*	*100%*	*100%*	*100%*	*82%*	*82%*	*100%*
Percentage of green bonds			0.6%		26.7%	26.7%	100%
(%)			*100%*		*100%*	*100%*	*100%*
Percentage of social and sustainable bonds			—		15.6%	15.6%	—
(%)			*100%*		*100%*	*100%*	*100%*

Holdings in non-euro-denominated own portfolios, 2022	Sovereigns (a)				Non-sovereigns		
	Approaches				Total	Supranational and agency bonds	Covered bonds
	Country excl. LULUCF (c)	Country incl. LULUCF (c)	Government	Consumption			
Main metrics							
Portfolio size (€bn eq)			31.9		10.5	10.5	0.001
WACI (b)	264.1	235.6	249.3	19.6	0.4	0.4	0.6
(tCO_2e/€m GDP (PPP), gov. (tCO_2e/€m GDP (PPP), revenues)	*100%*	*100%*	*100%*	*100%*	*93%*	*93%*	*100%*
Total absolute emissions	8,423,472	7,512,300	1,172,968	9,011,098	88	88	0.1
(scope 1 and 2 in tCO_2e)	*100%*	*100%*	*100%*	*100%*	*93%*	*93%*	*100%*
(scope 3 in tCO_2e)					139.298	139.121	178
					93%	*93%*	*100%*
Carbon footprint	264.1	235.6	36.8	282.5	0.01	0.01	0.1
(tCO_2e per €m eq invested)	*100%*	*100%*	*100%*	*100%*	*93%*	*93%*	*100%*
Additional metrics							
Carbon intensity	264.1	235.6	237.3	19.0	0.9	0.9	0.6
(tCO_2e/€m GDP (PPP), revenues)	*100%*	*100%*	*100%*	*100%*	*93%*	*93%*	*100%*
Percentage of green bonds			0.7%		8.2%	8.2%	100%
(%)			*100%*		*100%*	*100%*	*100%*
Percentage of social and sustainable bonds			—		0.7%	0.7%	—
(%)			*100%*		*100%*	*100%*	*100%*

SOURCE: Banco de España calculations, drawing on ISS, C4F, World Bank and BIS data. Previous years' figures have been updated per the data revisions and the latest information available (see Box 2 of the 2024 report).
NOTE: The percentages in italics beneath the metrics denote the level of data availability. The metrics are calculated using nominal values. The holdings refer to the position at each year-end. Holdings in the US dollar-denominated BISIP fund are included under their respective asset class.

a This asset class includes sovereign and sub-sovereign bonds and bonds issued by public sector entities.
b Weighted average carbon intensity.
c Due to the mathematical construction of the formula for sovereign assets, and under the production approach, when GDP is used as an attribution and normalisation factor the WACI, carbon footprint and carbon intensity metrics yield the same outcome.

Table A4.1

Main metrics of non-euro-denominated investment portfolios, 2019-2023 (cont'd)

Holdings in non-euro-denominated own portfolios, 2021	Sovereigns (a)				Non-sovereigns		
	Approaches						
	Country excl. LULUCF (c)	Country incl. LULUCF (c)	Government	Consumption	Total	Supranational and agency bonds	Covered bonds
Main metrics							
Portfolio size (€bn eq)			22.9		12.6	12.6	0.0
WACI (b)	326.7	294.5	288.0	19.2	3.0	3.0	0.6
(tCO_2e/€m GDP (PPP), gov. expend., pop., €m revenue)	*100%*	*100%*	*100%*	*100%*	*50%*	*50%*	*100%*
Total absolute emissions	7,465,382	6,728,196	1,025,420	7,962,296	681	680	0.2
(scope 1 and 2 in tCO_2e)	*100%*	*100%*	*100%*	*100%*	*49%*	*49%*	*100%*
(scope 3 in tCO_2e)					50,359	50,088	271
					49%	*49%*	*100%*
Carbon footprint	326.7	294.5	44.9	348.5	0.1	0.1	0.1
(tCO_2e per €m eq invested)	*100%*	*100%*	*100%*	*100%*	*49%*	*49%*	*100%*
Additional metrics							
Carbon intensity	326.7	294.5	272.5	18.4	4.1	4.1	0.6
(tCO_2e/€m GDP (PPP), revenues)	*100%*	*100%*	*100%*	*100%*	*49%*	*49%*	*100%*
Percentage of green bonds			0.6%		3.5%	3.5%	100%
(%)			*100%*		*100%*	*100%*	*100%*
Percentage of social and sustainable bonds			—		0.7%	0.7%	—
(%)			*100%*		*100%*	*100%*	*100%*

Holdings in non-euro-denominated own portfolios, 2020	Sovereigns (a)				Non-sovereigns		
	Approaches						
	Country excl. LULUCF (c)	Country incl. LULUCF (c)	Government	Consumption	Total	Supranational and agency bonds	Covered bonds
Main metrics							
Portfolio size (€bn eq)			26.2		9.3	9.3	0.0
WACI (b)	343.5	308.2	290.8	18.9	2.4	2.4	0.6
(tCO_2e/€m GDP (PPP), gov. expend., pop., €m revenue)	*100%*	*100%*	*100%*	*100%*	*47%*	*47%*	*100%*
Total absolute emissions	8,999,194	8,073,433	1,235,275	9,475,651	330	330	0.4
(scope 1 and 2 in tCO_2e)	*100%*	*100%*	*100%*	*100%*	*47%*	*47%*	*100%*
(scope 3 in tCO_2e)					46,689	46,413	276
					47%	*47%*	*100%*
Carbon footprint	343.5	308.2	47.2	361.7	0.1	0.1	0.1
(tCO_2e per €m eq invested)	*100%*	*100%*	*100%*	*100%*	*47%*	*47%*	*100%*
Additional metrics							
Carbon intensity	343.5	308.2	280.7	18.4	2.1	2.1	0.6
(tCO_2e/€m GDP (PPP), revenues)	*100%*	*100%*	*100%*	*100%*	*47%*	*47%*	*100%*
Percentage of green bonds			0.2%		2.3%	2.3%	100%
(%)			*100%*		*100%*	*100%*	*100%*
Percentage of social and sustainable bonds			—		2.1%	2.1%	—
(%)			*100%*		*100%*	*100%*	*100%*

SOURCE: Banco de España calculations, drawing on ISS, C4F, World Bank and BIS data. Previous years' figures have been updated per the data revisions and the latest information available (see Box 2 of the 2024 report).
NOTE: The percentages in italics beneath the metrics denote the level of data availability. The metrics are calculated using nominal values. The holdings refer to the position at each year-end. Holdings in the US dollar-denominated BISIP fund are included under their respective asset class.

a This asset class includes sovereign and sub-sovereign bonds and bonds issued by public sector entities.
b Weighted average carbon intensity.
c Due to the mathematical construction of the formula for sovereign assets, and under the production approach, when GDP is used as an attribution and normalisation factor the WACI, carbon footprint and carbon intensity metrics yield the same outcome.

Table A4.1

Main metrics of non-euro-denominated investment portfolios, 2019-2023 (cont'd)

Holdings in non-euro-denominated own portfolios, 2019	Sovereigns (a)				Non-sovereigns		
	Approaches						
	Country excl. LULUCF (c)	Country incl. LULUCF (c)	Government	Consumption	Total	Supranational and agency bonds	Covered bonds
Main metrics							
Portfolio size (€bn eq)		35.0			5.6	5.5	0.01
WACI (b)	356.7	324.3	486.0	20.6	1.7	1.7	0.7
(tCO_2e/€m GDP (PPP), gov. expend., pop., €m revenue)	*100%*	*100%*	*100%*	*100%*	*78%*	*78%*	*100%*
Total absolute emissions	12,496,538	11,360,049	2,541,681	13,123,297	355	354	1
(scope 1 and 2 in tCO_2e)	*100%*	*100%*	*100%*	*100%*	*78%*	*78%*	*100%*
(scope 3 in tCO_2e)					1,414	1,412	2
					78%	*78%*	*100%*
Carbon footprint	356.7	324.3	72.6	374.6	0.1	0.1	0.1
(tCO_2e per €m eq invested)	*100%*	*100%*	*100%*	*100%*	*78%*	*78%*	*100%*
Additional metrics							
Carbon intensity	356.7	324.3	471.3	20.0	1.2	1.2	0.7
(tCO_2e/€m GDP (PPP), revenues)	*100%*	*100%*	*100%*	*100%*	*78%*	*78%*	*100%*
Percentage of green bonds		0.1%			2.4%	2.3%	100%
(%)		*100%*			*100%*	*100%*	*100%*
Percentage of social and sustainable bonds		—			0.9%	0.9%	—
(%)		*100%*			*100%*	*100%*	*100%*

SOURCE: Banco de España calculations, drawing on ISS, C4F, World Bank and BIS data. Previous years' figures have been updated per the data revisions and the latest information available (see Box 2 of the 2024 report).
NOTE: The percentages in italics beneath the metrics denote the level of data availability. The metrics are calculated using nominal values. The holdings refer to the position at each year-end. Holdings in the US dollar-denominated BISIP fund are included under their respective asset class.

a This asset class includes sovereign and sub-sovereign bonds and bonds issued by public sector entities.
b Weighted average carbon intensity.
c Due to the mathematical construction of the formula for sovereign assets, and under the production approach, when GDP is used as an attribution and normalisation factor the WACI, carbon footprint and carbon intensity metrics yield the same outcome.

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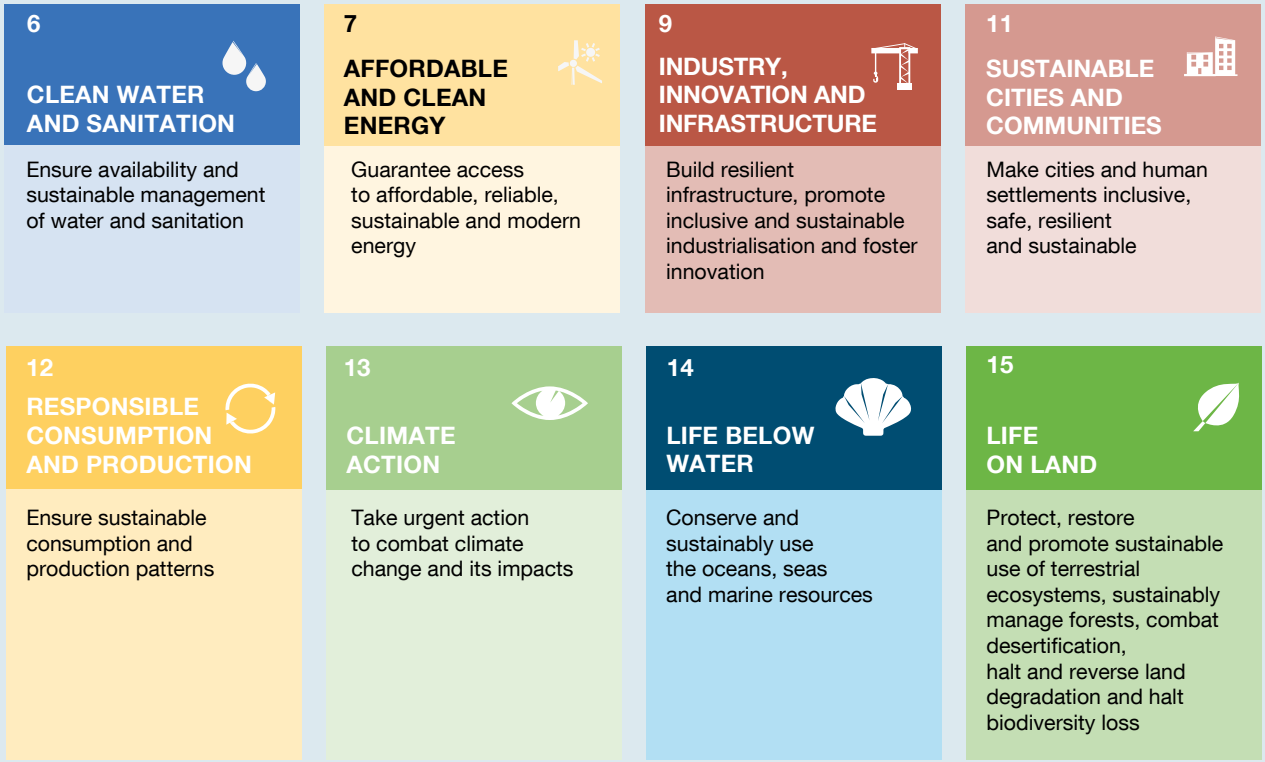
Box 1

CONTRIBUTION TO THE UNITED NATIONS' SUSTAINABLE DEVELOPMENT GOALS

Sustainable development is defined as that which meets present needs without compromising the ability of future generations to meet their needs. Achieving sustainable development requires a balance between three fundamental dimensions: economic growth, social inclusion and environmental protection. In 2015, the United Nations' member states enshrined this vision in the 2030 Agenda for Sustainable Development, which includes the Sustainable Development Goals (SDGs). The 17 SDGs represent a universal call to eradicate poverty, protect the planet and ensure prosperity, leaving no one behind. These goals are interrelated, so that action carried out in one area affects the results in the others. Each of the 17 goals has specific targets – 169 in total – to be achieved by 2030. However, the climate crisis, a weakened global economy, geopolitical conflicts and the lingering effects of COVID-19 are jeopardising the achievement of these goals (United Nations, 2023).

Climate change is closely linked to sustainable development, as it impacts areas such as public health, food and water security, migration, peace and security. Investment in sustainable development is vital to address climate change, as it helps to reduce GHG emissions and strengthen climate resilience. In particular, projects financed by green bonds, such as those targeting climate mitigation and adaptation, play a significant role in achieving the SDGs. The specific goals they contribute to may differ depending on the project category, but some SDGs benefit more significantly from green bonds than others. Specifically, Figure 1 shows the eight SDGs that benefit most from projects financed through direct investment in green bonds held in the Banco de España's SRI portfolio. As can be seen, the impact investment strategy aligns with the SDGs related to essential resources and services (SDGs 6 and 7), infrastructure and urban development (SDGs 9 and 11) and the environment and climate action (SDGs 12, 13, 14 and 15).

Figure 1
SDGs most aligned with the projects financed through direct investment in green bonds held in the Banco de España's SRI portfolio



SOURCE: Banco de España, drawing on data from the Luxembourg Green Exchange (LGX) by Luxembourg Stock Exchange.

The Banco de España publishes various types of documents providing information on its activity (economic reports, statistics, research papers, etc.), which can be consulted in the Institutional Repository at https://repositorio.bde.es/.

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