EUROPEAN CENTRAL BANK

EUROSYSTEM

# Climate-related financial disclosures of the ECB's non-monetary policy portfolios

June 2024

# Contents

# Foreword

Climate change is causing ever more devastation and human suffering across our planet, with Europe warming at a faster rate than the rest of the world. Taking urgent action to tackle this global crisis is the only way to avoid the worst of the irreversible and long-term damage. As a European institution, the ECB is determined to contribute within its mandate to solutions addressing this major challenge.

This report provides the second account of climate-related information about the ECB's staff pension fund and own funds portfolios, following our first publication last year. It tracks our efforts to decarbonise our balance sheet in line with the goals of the Paris Agreement and the EU's climate neutrality objectives. The interim targets for our corporate investments in our pension funds, which we present for the first time in this report, represent important milestones against which we will measure our progress over time.

2023 marked several positive developments on our decarbonisation journey. We adopted EU Paris-aligned benchmarks for all equity investments in our staff pension fund. This halved the carbon footprint of our corporate investments, which comprise some three-quarters of the ECB's staff pension fund. In the own funds portfolio, we added an explicit climate objective, which is of equal priority to our financial return objective. We increased the share of green bonds in our own funds portfolio to 20% (from 13% in 2022), which means we now provide over €4.5 billion in funding for the assets that will drive the transition to a net-zero economy. Looking ahead, we plan to increase the share of green bonds in our own funds portfolio to 25% in 2024.

At the same time, we are clearly still at the beginning of our journey. For the first time, we have published scope 3 emissions for our non-sovereign investments. However, due to data quality challenges we have presented these results in an annex to this report on a stand-alone, best-effort basis only. Data coverage on asset classes such as covered bonds also remains limited, which is why we actively support the ongoing efforts by the relevant international and European authorities in this field. Finally, the reduction in carbon emissions of our own funds, which are currently predominantly invested in sovereign bonds, continues to depend largely on governments' actions as signatories to the Paris Agreement and adopters of the European Climate Law.

By publishing climate-related information in line with a common framework, the central banks of the Eurosystem collectively aim to help harmonise disclosure practices, foster a better understanding of climate risks, and contribute to the transition to a net-zero economy and EU climate goals. We will continue to review and improve the scope and quality of our climate-related disclosures and we remain committed to transparency and accountability.

Frankfurt am Main, June 2024
Isabel Schnabel
Executive Board Member, European Central Bank

# 1 Introduction

Last year the ECB for the first time disclosed climate-related financial information about its euro-denominated non-monetary policy portfolios (NMPPs). This is the ECB's second annual report to disclose this information, covering the investments in its staff pension fund and own funds portfolio.

The disclosures follow the recommendations of the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD) and its supplemental guidance for asset owners. Disclosures in the "Metrics and targets" category adhere to the updated Eurosystem common disclosure framework, which in addition considers the recommendations of the Partnership for Carbon Accounting Financials (PCAF) and the Network of Central Banks and Supervisors for Greening the Financial System (NGFS).[1]

The disclosures are refined over time, in line with the increasing availability and quality of climate-related data, evolving disclosure methodologies and practices, as well as growing expertise in handling climate-related risks. By increasing the transparency of its own investments, the ECB aims to improve the availability of climate-related information and the understanding of climate-related risks. The intention is also to foster wider action, which is one of the ECB's three main objectives for its work on climate change. This year's report expands the scope of the ECB's disclosures to:

- sovereign production emissions including the effects of land use, land-use change and forestry (LULUCF) and sovereign portfolios' energy mix;
- metrics based on scope 3 emissions for non-sovereign issuers;
- new metrics, such as the share of green bonds in the staff pension fund;
- interim targets for the staff pension fund.

In 2023 the ECB made considerable progress on integrating climate considerations into the staff pension fund and own funds portfolio. All corporate investments in the staff pension fund now track EU benchmarks aligned with the Paris Agreement and have lowered emissions by around 50%. Estimates show that these investments are now in line with a scenario to limit global warming to approximately 1.8ºC above pre-industrial levels. The share of green bonds in the own funds portfolio has increased to 20% in 2023, which means that the portfolio now provides over €4.5 billion in funding for the low-carbon transition. Over 90% of this funding is allocated to issuers based in the European Union.

The report is structured as follows: Section 2 summarises the organisational set-up and the decision-making responsibilities underlying the ECB's staff pension fund and

[1] See TCFD, "Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures", October 2021, "Eurosystem agrees on common stance for climate change-related sustainable investments in non-monetary policy portfolios", *press release*, ECB, 4 February 2021, and NGFS, "Guide on climate-related disclosure for central banks", December 2021.

own funds portfolio. Section 3 describes how the ECB integrates sustainability considerations in both portfolios. Section 4 explains how the ECB considers climate risks when managing portfolio risks. Section 5 presents the relevant quantitative and qualitative metrics and targets.

# 2 Governance

The ECB and each of the Eurosystem national central banks manage NMPP investments under their own responsibility. Their activities in this regard are usually outside the scope of monetary policy mandates. The ECB has a wider range of options to steer its NMPP investments in a climate-conscious manner while achieving the specific objectives of these portfolios compared with the portfolios it holds for implementing monetary policy. The ECB's approach to its own NMPP investment policies is guided by the common Eurosystem framework for climate change-related sustainable investment principles.

The ECB continues to address climate change-related considerations within its existing governance structures and investment strategies.[2] The Executive Board is supported in its oversight of climate-related risks and opportunities for the own funds portfolio by the ECB's internal Investment Committee (ICO), and for the staff pension fund by the Investment Committee in its Pension Fund composition (ICO/PF), which includes two staff representatives. The investment decisions in the pension fund also fall under the scrutiny of the staff-elected ECB Pension Oversight Committee (OCO). Investment strategies incorporating climate change considerations are implemented by the ECB's portfolio management experts in the Directorate General Market Operations and Directorate Risk Management for the own funds portfolio, and by external investment managers for the pension fund. The Executive Board regularly approves the investment strategies and interim and long-term sustainability targets for both portfolios based on the proposals of the ICO and ICO/PF.

Incorporating climate considerations in NMPPs contributes to the ECB's overall climate strategy, which is steered by the ECB's climate change centre. The ECB's Annual Report provides an overview of the climate strategy and its implementation.

[2] For a detailed description of the governance structure, see ECB, "ECB's Climate-related financial disclosures of the ECB's non-monetary portfolios", March 2023.

# 3 Strategy

As an institutional asset owner, the ECB needs to assess climate-related risks and opportunities arising from its NMPP investments. Climate-related risks are integrated in the overall risk management process as an amplifying factor for existing risk categories such as credit and market risks. To develop and exchange knowledge with peers, the ECB actively participates in international discussions on climate-related risks under the aegis of the NGFS. Risks and opportunities related to climate change are also discussed within the Eurosystem.

The ECB's strategy is to align its NMPPs with the EU's long-term decarbonisation objective in support of the Paris Agreement and the European Climate Law. To this end, the ECB presents for the first time interim emission reduction targets for the corporate investments in its staff pension fund. The ECB has also bolstered its 2023 commitment to lower the emissions of its own funds portfolio by adding an explicit climate objective for its investments, which is of equal priority to its pre-existing financial objectives.

The sustainability considerations that the ECB applies to its staff pension fund and own funds portfolios are subject to portfolio-specific objectives and constraints. Figure 1 summarises the main features of the climate-related investment strategy for both portfolios.

The ECB's sustainability strategy for its staff pension fund continues to be based on four elements:

- Investment managers are required to be signatories to the United Nations' Principles for Responsible Investment (UN PRI) and the United Nations' Global Compact (UN GC).
- Two external investment managers vote and engage in line with their proxy voting and engagement guidelines, which incorporate environmental, social and governance (ESG) principles. Both managers apply their guidelines independently and regularly report to the ECB on the impact of their voting and engagement activities.
- Issuers that violate the UN GC principles, international treaties and conventions related to controversial weapons are excluded from the investment universe.
- As of 2023 all corporate investments (equity and corporate bonds) track EU Paris-aligned benchmarks, which means that their carbon footprint follows a gradual decarbonisation trajectory.

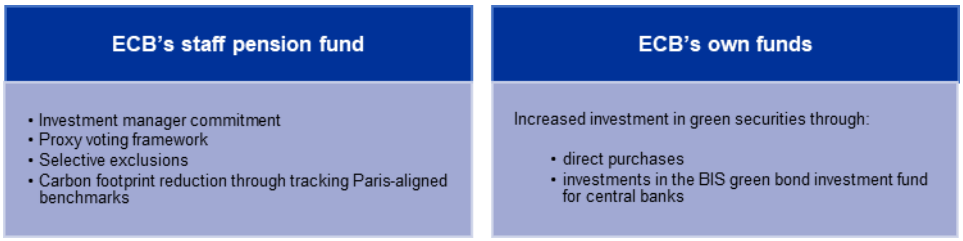
The ECB's own funds portfolio predominantly comprises sovereign bonds. Therefore, the reduction of emissions largely relies on governments to deliver on their decarbonisation pledges as signatories to the Paris Agreement and adopters of the European Climate Law. By increasing the share of green bonds in this portfolio, the

ECB pursues an impact investment strategy that further contributes to the transition of the real economy.

The Executive Board sets year-end targets for the share of green bond holdings based on a proposal by the ECB's ICO. These targets are achieved via a combination of direct green bond purchases and additional investments in the externally-managed Bank for International Settlements (BIS) green bond investment fund for central banks. [3]

**Figure 1**

Climate change strategies for the ECB's staff pension fund and own funds portfolio




Source: ECB.

Section 5 presents the climate-related targets for the ECB's NMPPs and outlines the climate-related metrics used to track progress. Expanding the use of Paris-aligned benchmarks to all corporate investments in the ECB staff pension fund in 2023 has shifted the focus towards the carbon footprint metric for these investments, in line with the specifications of the relevant regulations applying to these benchmarks for tracking progress. For the own funds portfolio, the reporting of the share of green bonds tracks the progress on our impact investment strategy. Overall, the still-evolving methodologies and data challenges for some asset classes require careful consideration in further advances on disclosures. The ECB has accordingly deemed it prudent to track progress along several complementary metrics which are also disclosed in this report.

[3] See "ECB to invest in Bank for International Settlements' green bond fund", *press release*, ECB, 25 January 2021.

# 4 Risk management

The ECB has adopted the recommendations and terminology proposed by the TCFD in identifying, assessing and mitigating climate-related risks. Risk management is a continuous process of (i) risk identification and assessment, (ii) review of the risk strategy and policies, (iii) implementation of risk-mitigating actions, and (iv) risk monitoring and reporting, all of which are supported by effective methodologies, processes and systems.[4] The ECB actively integrates long-term climate-related risks into the processes governing its NMPPs and continues to explore methodological enhancements. To support this work, the central banks of the Eurosystem have jointly identified relevant data sources (see Section 5).

As a prominent public institution operating at the centre of the European financial system, the ECB recognises the importance of developing a thorough understanding of the climate risks of its NMPPs. The ECB works continuously to improve this knowledge.

The ECB's NMPPs are exposed to climate risks, which might lead to adverse outcomes in the event of gradual risk factor changes or a climate shock. A distinction is made between transition risks and physical risks. Transition risks concern the likelihood and impact of the economic consequences of the transition to a carbon-neutral economy. Physical risks, by contrast, concern the likelihood and impact of severe weather events or natural disasters occurring.

The ECB takes a holistic view in assessing and managing the potential impact of climate risks via the NMPPs on its balance sheet. Carbon intensity metrics are used as a proxy for transition risks with a potential negative impact on the balance sheet, as policies adopted to align with the Paris Agreement can affect the financial position and performance of issuers.

Investment limits are monitored within the established risk management framework for the NMPPs. For the staff pension fund it is ensured that the externally-managed investment funds closely follow their Paris-aligned benchmarks. Detected breaches are investigated by the Directorate Risk Management following a standardised procedure, and appropriate resolutions are examined and implemented. The Directorate Risk Management reports monthly to the ICO/PF on the general performance of the investment funds, and benchmark breaches are explicitly discussed by the committee. Similarly, for the own funds portfolio, it is ensured that the thematic investment objectives are integrated in the ECB's strategic benchmark in accordance with pre-specified risk budgets.

The new climate objective for the own funds portfolio, which was added in 2023 and complements the return objective, specifies that risks originating from climate change are considered in their management with the objective of aligning the portfolio with a decarbonisation path that is consistent with the goals of the Paris Agreement and in

[4] For further details on its financial and non-financial risk management processes, see the ECB Annual Report.

line with the European Climate Law. The climate goal has equal priority to other investment goals of the portfolio.

# 5 Metrics and targets

The ECB's staff pension fund and the own funds portfolio account for around €24 billion in investments held across different asset classes. Four key metrics provide the foundation of the TCFD reporting on both portfolios. They create transparency about exposures to climate risks and inform the ECB's internal decision-making processes. The key metrics are the weighted average carbon intensity (WACI), carbon intensity, total carbon emissions, and the carbon footprint. Annex 1 defines each metric. Annex 2 provides information on the applied emissions allocation methods, normalisation and attribution factors. Two climate data providers, Institutional Shareholder Services (ISS) and Carbon4 Finance, have been selected to provide the ECB with the necessary climate data.

Calculations for sovereign issuers are based on production, consumption and government emissions. Compared to last year's report, reporting on sovereign issuers has been expanded to production emissions including the effects of land use, land-use change and forestry (LULUCF). Only production emissions excluding the effects of LULUCF are self-reported by sovereigns; all other emissions are modelled by the data providers. The latest available sovereign emissions data refer to 2021.

Calculations for non-sovereign issuers are based on a mix of issuer self-reported and data provider modelled scope 1, 2 and 3 emissions, with self-reported emissions preferred whenever available. Compared with last year's report, reporting on non-sovereign issuers now covers scope 3 emissions, which are reported in Annexes 4 and 6. The latest available scope 1, 2, and 3 emissions data refer to 2022.

Macroeconomic developments have contributed significantly to the changes in key climate-related metrics in recent years. The recovery in economic activity from the coronavirus (COVID-19) pandemic led to increases in issuers' emissions. At the same time, the recovery also resulted in increases in issuers' economic activity as measured by corporate revenue and national GDP. On balance, the relative increase in economic activity exceeded that of emissions, leading to improvements in carbon intensities for many issuers. The remainder of this section analyses the climate-related developments of the ECB's staff pension fund and the own funds portfolio in greater detail. Changes compared to the metrics reported in last year's report may reflect improved data availability or a retrospective revision of issuers' emissions or financial data.

## 5.1 Staff pension fund

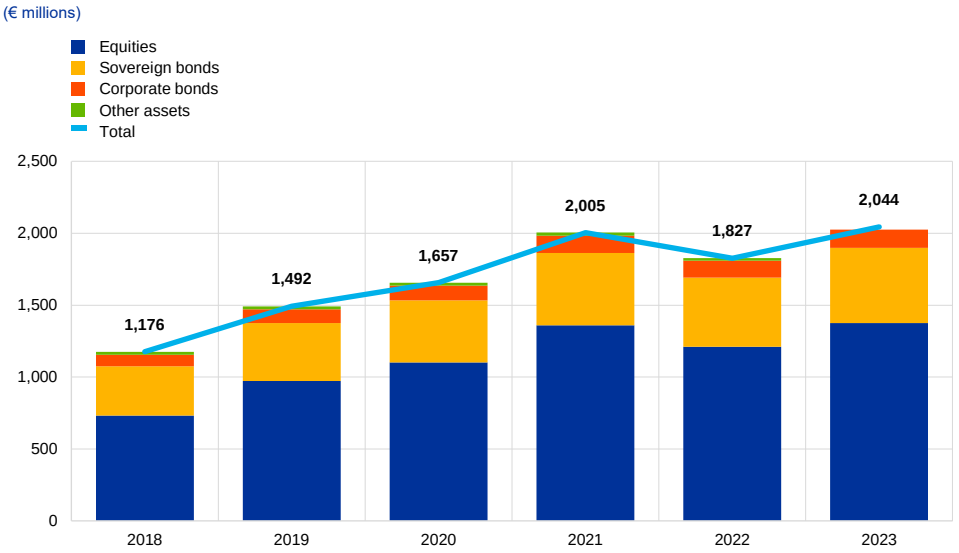
- Corporate investments, which comprise approximately 75% of total pension fund assets, now track EU Paris-aligned benchmarks and have around 50% lower emissions in 2023 compared with the previous year.

- Corporate investments in the fossil fuel sector have declined to less than 0.1% in 2023 (from 3.9% in 2022) while investments in alternative energy sources have increased over this period.
- Corporate investments are in line with a global warming scenario of approximately 1.8ºC.

The value of the ECB staff pension fund amounted to approximately €2 billion in 2023, of which 67% was invested in equities, 26% in sovereign bonds, 6% in corporate bonds and 1% in other assets such as cash and derivatives that are excluded from the metrics (Chart 1). Year-on-year changes in portfolio value reflect investment returns and the difference between pay-outs and paid-in contributions of members and of the ECB. The pension fund invests globally in financial assets across developed and emerging markets.

**Chart 1**

Portfolio value and asset allocation of the staff pension fund




Source: ECB calculations.

Table 1 shows key climate-related metrics for the staff pension fund in 2023. The metrics indicate the extent to which the pension fund is exposed to climate transition risks via its sovereign and corporate investments, which could result from policy actions targeted at reducing emissions at issuer or portfolio level. Metrics for sovereign and non-sovereign investments should be interpreted separately, as the different underlying emissions allocation methods do not allow for direct comparison.

The evolution in climate metrics used to assess the staff pension fund are further detailed in the remainder of this section. The full history of metrics based on scope 1 + 2 emissions, which form the basis of this report, is presented in Annex 3. In addition, the ECB for the first time discloses scope 3 emissions-based metrics in Annex 4.

**Table 1**

Key climate-related metrics for the staff pension fund in 2023

| | Sovereign issuers | | | | Corporate issuers | | |
|---|---|---|---|---|---|---|---|
| | Sovereign and sub-sovereign bonds | | | | | | |
| | Production | | | | | | |
| | excl. LULUCF | incl. LULUCF | Consumption | Government | Total | Bonds | Equities |
| **Portfolio value (EUR million market value)** | 523 | | | | 1,502 | 126 | 1,376 |
| **WACI** | 136 | 128 | 9.4 | 63 | 46 | 69 | 43 |
| **Total carbon emissions** | 64,365 | 60,872 | 83,575 | 6,426 | 22,370 | 4,020 | 18,350 |
| **Carbon footprint** | 136 | 128 | 176 | 14 | 14 | 25 | 13 |
| **Carbon intensity** | 136 | 128 | 9.2 | 63 | 41 | 73 | 37 |

Sources: ISS, Carbon4 Finance, World Bank, Bloomberg and ECB calculations.
Notes: The table shows key metrics for the staff pension fund by asset class. For sovereign bonds, metrics are separately provided for production emissions (excluding and including LULUCF), consumption emissions and government emissions. For corporate bonds and equity, metrics are provided on asset class and aggregate level ("Total"), based on issuers' scope 1 and scope 2 emissions. Portfolio value is expressed in € millions market value. The WACI and carbon intensity are expressed as $tCO_2e$ per € million revenue (corporate issuers), PPP-adjusted GDP (sovereign issuers and production emissions), per capita (sovereign issuers and consumption emissions), or final consumption expenditure (sovereign issuers and government emissions). Total carbon emissions are expressed as $tCO_2e$. Carbon footprint is expressed as $tCO_2e$ per € million invested. Metrics are calculated using market values for equities and nominal values for bonds.

### 5.1.1 Staff pension fund – corporate investments

The staff pension fund's corporate investments (equity + corporate bonds) reduced emissions by around 50% in 2023, as reflected by the decline in all four key metrics (Chart 2). The significant reduction in the portfolio's exposure to climate transition risks was driven by the adoption of Paris-aligned benchmarks for all equity investments in 2023. With corporate bond investments already tracking Paris-aligned benchmarks since 2022, the adoption of new equity benchmarks in 2023 means that all corporate investments in the staff pension fund (approximately 75% of the total assets) now track Paris-aligned benchmarks and will decarbonise in line with the objectives of the European Climate Law.

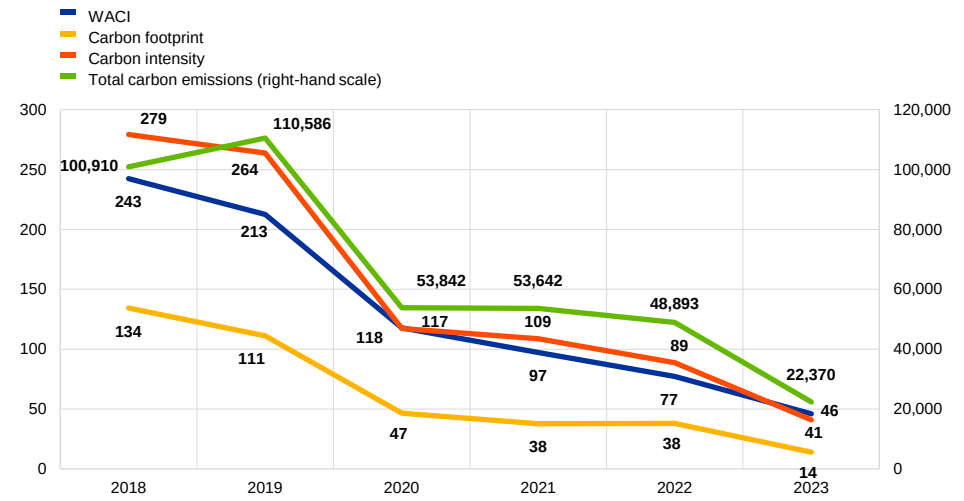
Paris-aligned benchmarks follow a pre-defined self-decarbonisation path that must meet the minimum standards defined in the EU Benchmarks Regulation and accompanying Commission Delegated Regulation. This stipulates that benchmarks labelled as "Paris-aligned" must have an initial carbon intensity baseline that is at least 50% lower than the carbon intensity of the investable universe, followed by an average annual reduction of at least 7%. In addition, Paris-aligned benchmarks apply a combination of norms-based and activity-based exclusions related to coal, oil and gas.

The carbon footprint of the corporate investments in the staff pension fund, which is the reference metric for Paris-aligned benchmarks to steer portfolio decarbonisation, has declined by over 60% in 2023, compared to 2022, following the adoption of the new equity benchmarks. Over a multi-year period, the reduction of emissions from corporate investments was even more marked, with a carbon footprint reduction of around 90% from 2018 to 2023.

For a correct interpretation of the trends observed in Chart 2, it is important to consider aspects related to the underlying data. Metrics calculated for the staff pension fund holdings of 2022 and 2023 are based on the same corporate emissions and corporate financial data because of the natural delay in reporting those data. The application of identical emissions data to 2022 and 2023 holdings works as an artificial stabiliser for related metrics throughout this report. In future reports, the ECB will retrospectively update metrics that were based on data with different reference years compared to that of the portfolio holdings, as the revised data become available. The retrospective updates may lead to changes in reported metrics in either direction, depending on the revised data.

**Chart 2**

Evolution in key metrics for corporate investments in the staff pension fund




Sources: ISS, Carbon4 Finance, World Bank, Bloomberg and ECB calculations.
Notes: The chart shows the evolution of key metrics for the pension fund's corporate investments (equity + corporate bonds) based on issuers' scope 1 + 2 emissions. Metrics are calculated using market values for equities and nominal values for bonds. Changes compared to the metrics reported in the previous year's report may be related to improved data availability or to a retrospective revision of issuers' emissions or financial data.

A breakdown of the staff pension fund's total carbon emissions by sector shows a concentration in utilities, information technology, industrials and materials (Chart 3). In 2023 these four sectors collectively contributed 79% to corporates' total carbon emissions (panel a), while accounting for 50% of corporate holdings (panel b).

The high emissions contribution of the information technology and industrials sectors reflects the significant amounts invested in the staff pension fund. By contrast, the disproportionately large contribution of the utilities sector to the total carbon emissions of corporate investments is driven by its high carbon intensity (panel c), which illustrates that the potential to decarbonise a portfolio is concentrated in its most energy-intensive sectors.

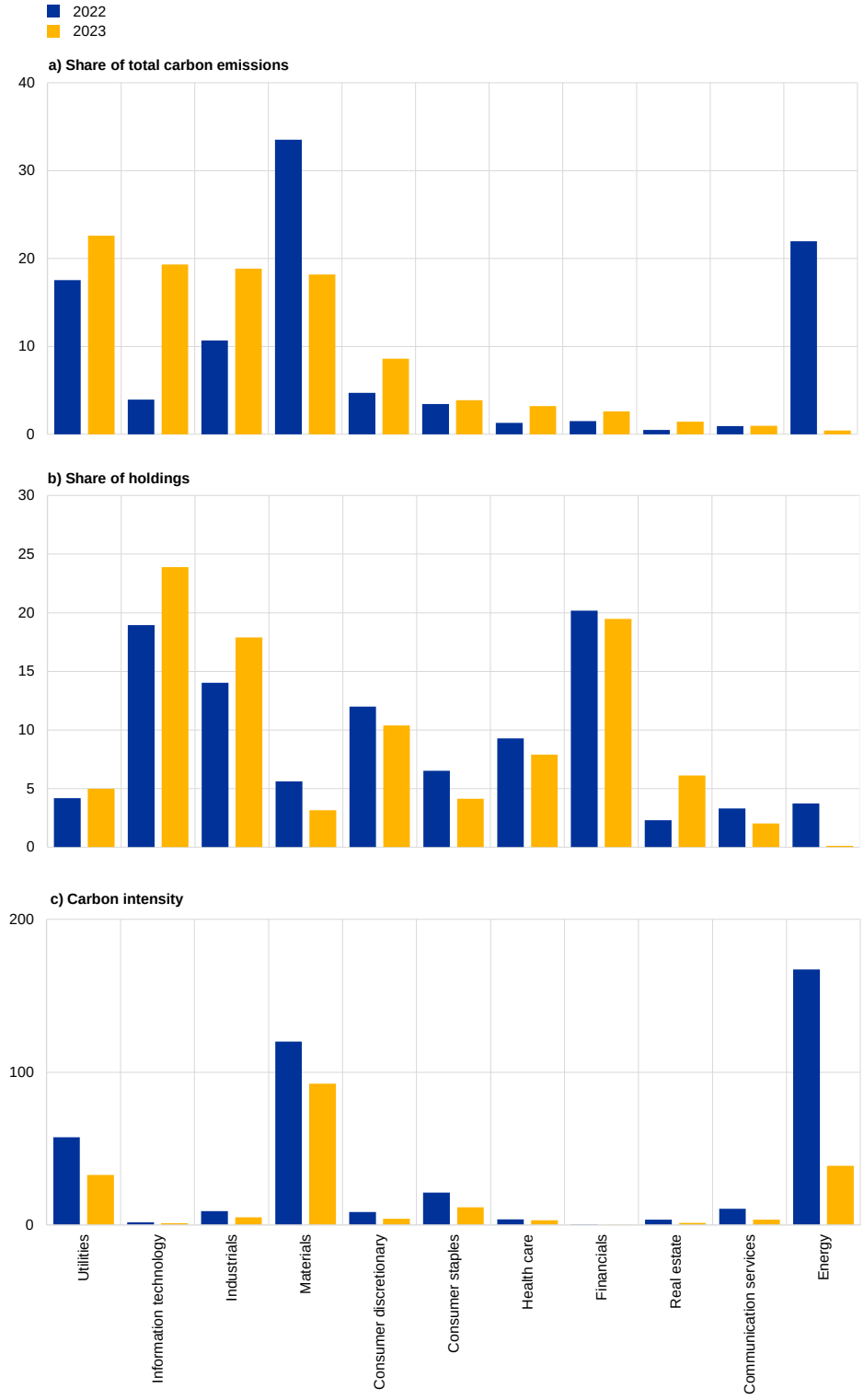
The adoption of EU Paris-aligned equity benchmarks in 2023 led to notable changes compared with the previous year's sectoral breakdown statistics. First, sectoral capital reallocation included a sharp decline in exposure to the energy sector, reflecting activity-based exclusions. Second, the carbon intensity of the portfolio holdings

declined across most sectors owing to the “best-in class approach”, which involves reallocating holdings towards the most carbon-efficient issuers in each sector. The altered sectoral contribution to total carbon emissions is a result of the capital reallocation across and within sectors.

## Chart 3

Breakdown by sector of corporate total carbon emissions in the staff pension fund

(panel a) and b): percentages; panel c): $tCO_2e$/€ millions EVIC)

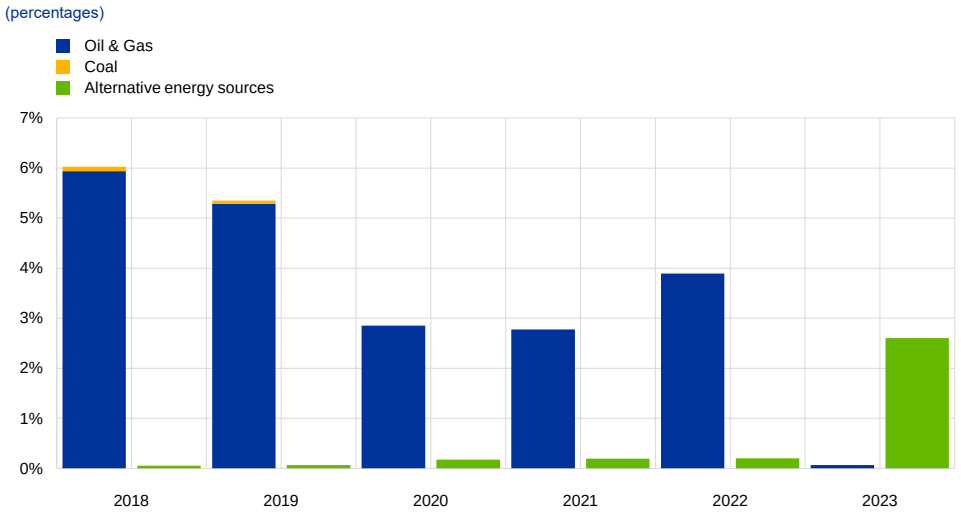



Sources: ISS, Carbon4 Finance, World Bank, Bloomberg and ECB calculations.
Notes: Panel a) shows the sectoral contribution to the pension fund's corporate (equity and bonds) total carbon emissions. Panel b) shows the sectoral share of corporate holdings. Panel c) shows the sectoral median carbon intensity expressed as scope 1 + 2 emissions (in $tCO_2e$) divided by EVIC (in € millions). Changes compared to the metrics reported in the previous year's report may be related to improved data availability or to a retrospective revision of issuers' emissions or financial data.

The activity-based exclusions of the Paris-aligned equity benchmarks have resulted in a significant change in the staff pension fund's investments in the oil and gas industry, which declined from 3.9% in 2022 to less than 0.1% in 2023 (Chart 4). Over the same period, investments in the alternative energy industry, which includes solar and wind energy, have increased from 0.2% to 2.6%. Exclusion-driven capital reallocation is only possible in portfolios that are sufficiently flexible in their management and do not fulfil monetary policy purposes.

**Chart 4**

Corporate investments in the fossil fuel and alternative energy industries in the staff pension fund



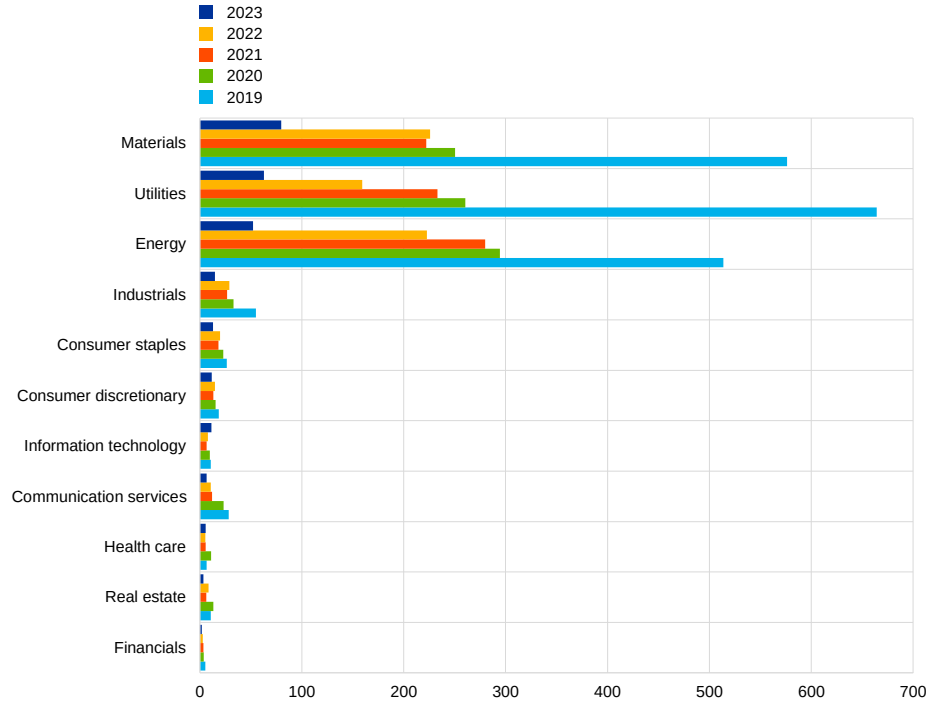

Sources: Bloomberg and ECB calculations.
Notes: The chart shows the share of corporate investments in the staff pension fund that are invested in fossil fuels and alternative energy sources. The sector classification is based on Bloomberg field "Industry Group". The sectors "Oil & Gas", "Oil & Gas Services" and "Gas" have been grouped together into "Oil and Gas". The metric is calculated using market values for equities and nominal values for bonds. Changes may be related to shifts in portfolio investments or changing equity market values.

Breaking down the carbon footprint into corporate sectors provides insights into how the staff pension fund's corporate investments have decarbonised over time (Chart 5). Between 2019 and 2023 the corporate carbon footprint declined across 10 out of 11 sectors, with the sharpest declines in the carbon-intensive sectors of utilities (-91%), energy (-90%) and materials (-86%).

**Chart 5**

Breakdown by sector of the corporate carbon footprint in the staff pension fund

($tCO_2e$/€ millions)




Sources: ISS, Carbon4 Finance, World Bank, Bloomberg and ECB calculations.
Notes: The chart shows the pension funds' carbon footprint per corporate sector from 2019 to 2023. Metrics are calculated using market values for equities and nominal values for bonds. Sectors are sorted in descending order from the highest carbon footprint to the lowest carbon footprint. Changes compared with the metrics in last years' report may relate to improved data availability or to a retrospective revision of issuers' emissions or financial data.

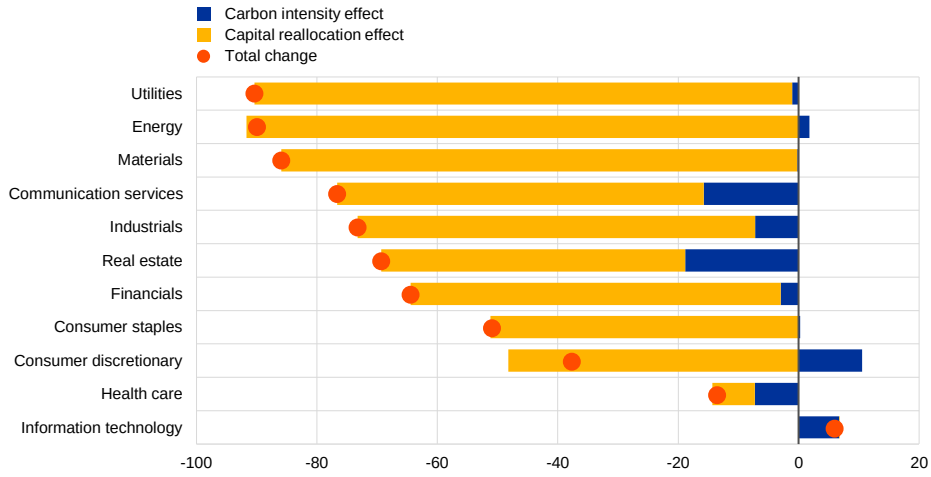
Two factors contribute to changes in the sectoral carbon footprint of the corporate investments in the staff pension fund over time: (i) changes in issuers' carbon intensity, and (ii) benchmark capital reallocation. To estimate the effect of the low-carbon and Paris-aligned benchmarks' best-in-class capital reallocation, Chart 6 isolates the contribution of both factors.

The analysis shows that the EU Paris-aligned benchmarks' best-in-class capital reallocation (together with the reallocation due to the previous benchmark) led to a reduction of the sectoral carbon footprint for 10 out of 11 sectors, which means that the benchmarks were highly effective in decarbonising the staff pension fund. The capital reallocation effect was most pronounced in the carbon-intensive sectors of utilities, energy and materials. In addition, improved carbon intensity at issuer level contributed to a reduced sectoral carbon footprint in 7 out of 11 sectors.

**Chart 6**

Attribution of the changes in sectoral corporate carbon footprint between 2019 and 2023 to the capital reallocation effect and the carbon intensity effect

(percentages)

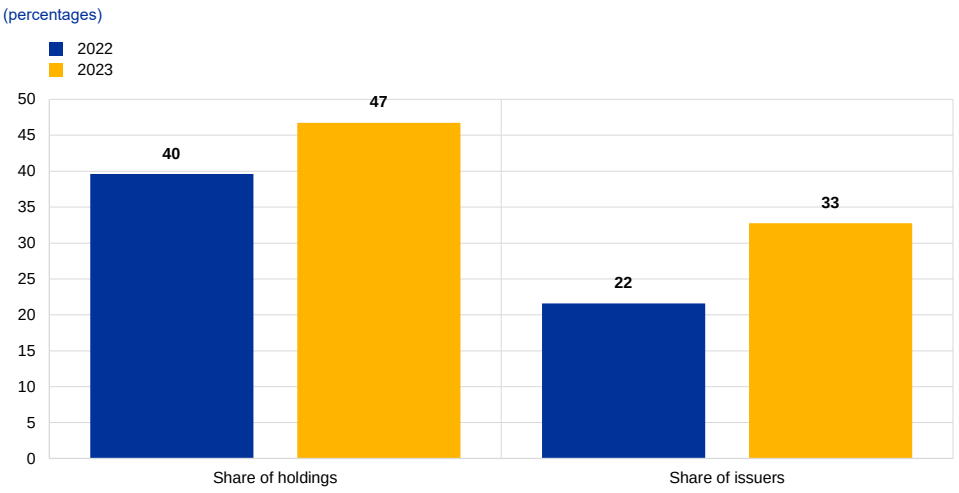



Sources: ISS, Carbon4 Finance, World Bank, Bloomberg and ECB calculations.
Notes: To isolate the capital reallocation and the capital intensity effect, we apply a Marshall-Edgeworth-type decomposition which uses the simple average of the previous and present period values. Carbon intensity is expressed as scope 1 + 2 emissions (in $tCO_2e$) divided by EVIC (in € millions).

Achieving the goals of the Paris Agreement requires a significant reduction in absolute emissions. Further reductions in absolute global emissions require issuers to deliver on their self-imposed emission reduction targets. The staff pension fund allocates a large share of its corporate investments to issuers that set science-based targets to decarbonise their operations (Chart 7). In 2023, 33% of the corporate issuers held in pension fund portfolios set science-based targets, reflecting 47% of the corporate investments. Compared to 2022, the share of issuers in the investment universe with science-based targets increased by 11 percentage points, while the share of investments in issuers with such targets increased by 7 percentage points.

## Chart 7

Share of holdings and issuers in the staff pension fund with science-based targets

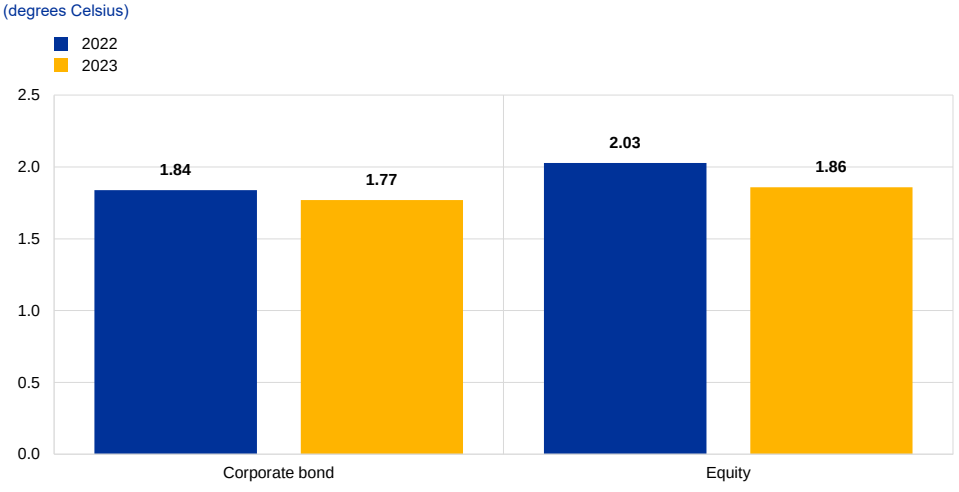



Sources: ISS and ECB calculations.
Notes: The chart shows the staff pension fund's share of holdings and share of issuers with science-based emissions reduction targets. Metrics are calculated using market values for equities and nominal values for bonds.

Forward-looking analysis based on the proprietary issuer temperature score of the data service provider ISS suggests that the staff pension fund's current corporate bond investments are in line with a global warming scenario of 1.77ºC and of 1.86ºC for equity investments (Chart 8). Compared with 2023, the issuer temperature score for corporate bond investments declined by -0.07ºC, while the score for equity investments declined by -0.17ºC. The results should only serve as a rough indication, as forward-looking analysis is subject to considerable uncertainty.

## Chart 8

Issuer temperature score of corporate investments in the staff pension fund




Sources: ISS and ECB calculations.
Notes: The chart shows the investment weighted issuer temperature score of the pension fund's equity and corporate bond investments. Issuer temperature score data were available for 97% of corporate bond investments and 98% of the equity investments. The forward-looking analysis underlying the score considers the latest International Energy Agency Sustainable Development Scenarios (IEA SDS), projected future emissions and science-based targets. Metrics are calculated using market values for equities and nominal values for bonds.

The ECB aims to incentivise corporate issuers held in the staff pension fund to reduce their absolute emissions and improve the carbon efficiency of their operations via two channels. First, via voting and engagement conducted by the staff pension funds' two external investment managers. Second, via the Paris-aligned benchmarks' best-in-class capital reallocation towards the most carbon-efficient issuers in each sector and activity-based exclusions, which may affect issuers' funding costs.

### 5.1.2 Staff pension fund – sovereign investments

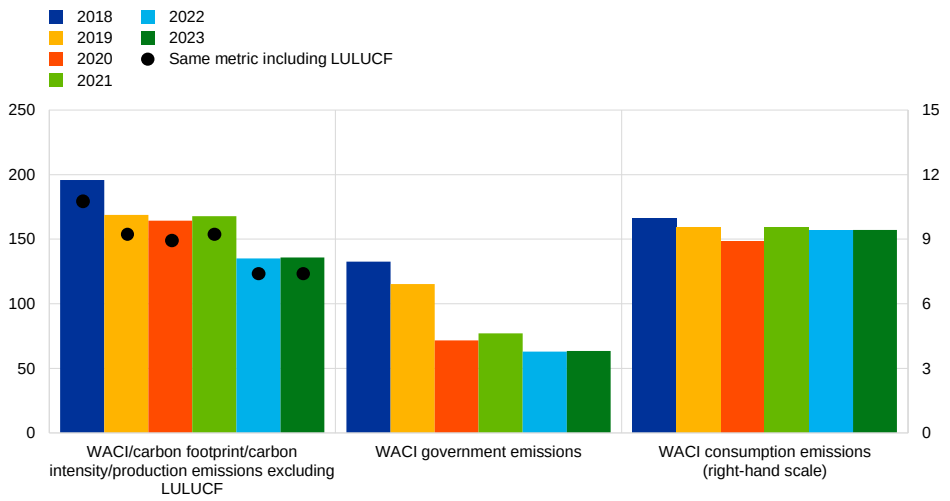
All sovereign issuers whose assets are held in the staff pension fund are signatories to the Paris Agreement and have committed to decarbonising their economies in line with its goals. A look at the key metrics for sovereign bond investments in the staff pension fund (Chart 9) indicates that some decarbonisation occurred in normalised metrics in recent years. However, the metrics are affected by the timing of the data becoming available and the temporary effects of the pandemic.

The WACI of sovereign bond investments is illustrated for production, consumption and government emissions to provide a holistic view of the impact of countries' efforts to decarbonise their territorial emissions, domestic demand and activities directly linked to the government. Between 2021 (the last year for which emissions data are available) and 2023, the WACI based on production emissions (which is equal to the carbon footprint and the carbon intensity metrics) and for government emissions declined by around 18%, while the WACI for consumption emissions remained stable. Since the same emissions data apply to all three years, the declines solely reflect increases in countries' GDP from 2021 to 2022 (the latest available GDP data) and governments' final consumption expenditure (since 2020) in the aftermath of the pandemic, as well as portfolio rebalancing effects.

**Chart 9**

Evolution of key metrics for sovereign bond investments in the staff pension fund

(left-hand scale: $tCO_2e$/€ millions; right-hand scale: $tCO_2e$/population)




Sources: ISS, Carbon4 Finance, World Bank, Bloomberg, UNFCCC and ECB calculations.
Notes: The WACI is illustrated for production, consumption and government emissions. Production and government emissions are based on ISS data; consumption emissions are based on Carbon4 Finance data. Production emissions are reported excluding and including the effects of LULUCF. The WACI is denominated in $tCO_2e$ per € million GDP (production emissions), $tCO_2e$ per € million government consumption (government emissions) and $tCO_2e$ per capita (consumption emissions). Metrics are calculated using bonds' nominal values. Underlying holdings refer to year-end values. Changes compared to the metrics reported in the previous year's report may be related to improved data availability or to a retrospective revision of issuers' emissions or financial data.

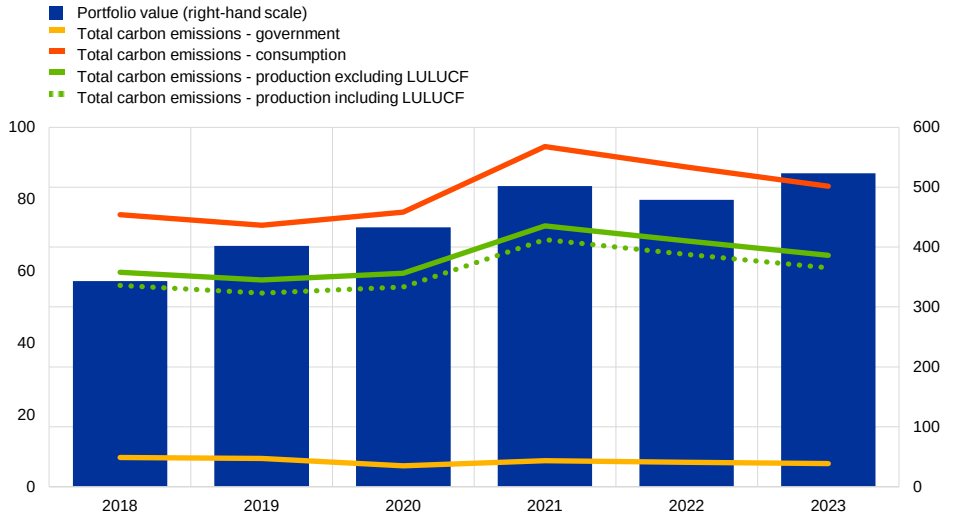
Between 2021 and 2023 the total carbon emissions based on production emissions (excluding and including LULUCF), consumption emissions and government emissions declined by approximately 11% (Chart 10), driven by a combination of reduced exposure to sovereign bonds and an increase in countries' average GDP. The level of consumption emissions exceeds that of production emissions, which shows that the euro area countries whose assets are held in the staff pension fund are, on aggregate, net carbon importers.

In their submitted nationally determined contributions, sovereigns target a reduction in territorial production emissions. An analysis of the annual historical absolute emissions paths of sovereign issuers held in the pension fund in 2023 shows that they have on average decarbonised their economies in absolute terms. Between 2017 and 2021 (the latest available reference year for which sovereign emissions data are available), sovereign issuers held in the staff pension fund as at the end of 2023 reduced their production emissions on average by 2% per year. Future data releases will show the extent to which this trend was driven by the temporary effects of the outbreak of the pandemic.

**Chart 10**

Total carbon emissions of sovereign bond investments in the staff pension fund

(left-hand scale: thousands $tCO_2e$; right-hand scale: € millions)



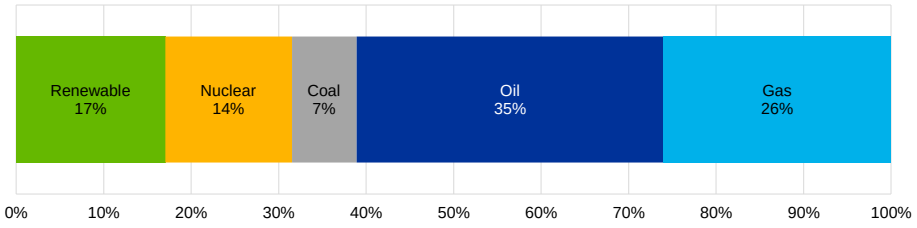

Sources: ISS, Carbon4 Finance, World Bank, Bloomberg, UNFCCC and ECB calculations.
Notes: Production emissions are reported excluding and including the effects of LULUCF. Metrics are calculated using bonds' nominal values. Underlying holdings refer to year-end values. Changes compared to the metrics reported in last year's report may be related to improved data availability or to a retrospective revision of issuers' emissions or financial data.

Monitoring countries' energy mix can provide insights in the progress of the low-carbon transition of the sovereigns' energy system. Chart 11 shows the weighted average energy mix of the sovereign bond issuers in the staff pension fund in 2023. Renewable and low-carbon nuclear energy together account for around one-third and fossil fuels including coal, oil and gas account for two-thirds of the total energy supply mix.

**Chart 11**

Total energy supply mix of sovereign bond issuers in the staff pension fund

(percentages)




Sources: ISS and ECB calculations.
Notes: The chart shows the weighted average total energy supply mix of the sovereign bond issuers in the staff pension fund in 2023. Weighting is conducted using bonds' nominal values. Total energy supply represents the quantity of all energy necessary to satisfy inland consumption. It is defined as Total energy supply = production + imports - exports - international marine bunkers - international aviation bunkers +/- stock changes.

The staff pension fund also contributes to financing the low-carbon transition by investing in green bonds. In 2023 green bond investments amounted to €27 million, representing a share of around 4% of total bond investments. Of the green bond investments, around 30% were held in sovereign issuers and 70% in corporate issuers. Around two-thirds of the green bond investments were held in bonds with a

maturity exceeding five years, providing long-term funding for the transition. In total, 85% of the green bond issuers were in the euro area, and 4% in other EU countries.

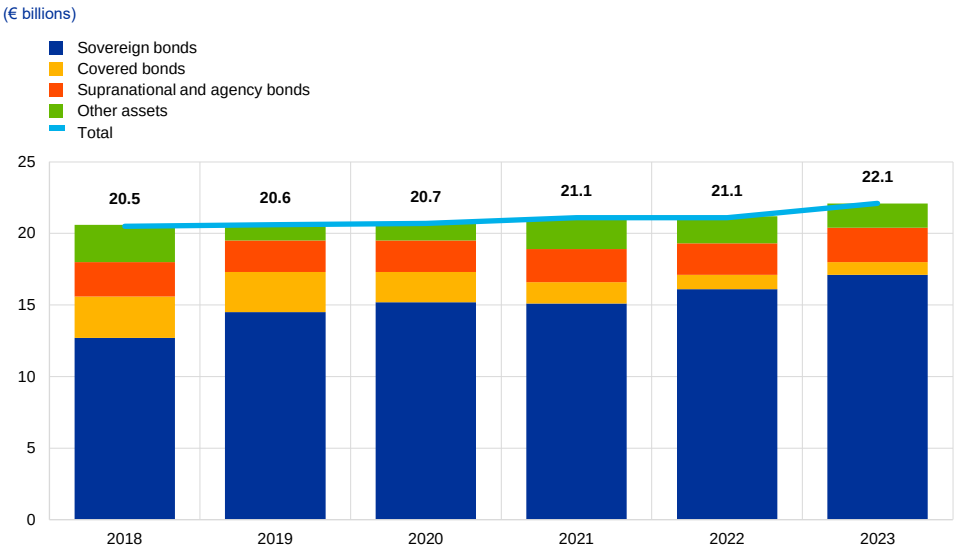
## 5.2 Own funds portfolio

- The portfolio's green bond investments provide €4.5 billion of funding for the low-carbon transition, of which over 90% is allocated to issuers located in the EU.
- The green bond share of the portfolio increased by 7 percentage points to 20% in 2023.

The ECB own funds portfolio value was €22.1 billion as at the end of 2023, of which 77% was invested in sovereign bonds, 11% in supranational and agency bonds, 4% in covered bonds and 8% in other assets including cash (Chart 12). The disclosures cover all asset classes in the portfolio, except for cash and derivatives. Year-on-year changes in the portfolio value reflect investment performance as well as capital injections, partly related to Croatia's entry into the euro area. The own funds portfolio is predominantly invested in fixed income assets issued by euro area issuers.

**Chart 12**

Portfolio value and asset allocation of the own funds portfolio




Source: ECB calculations.

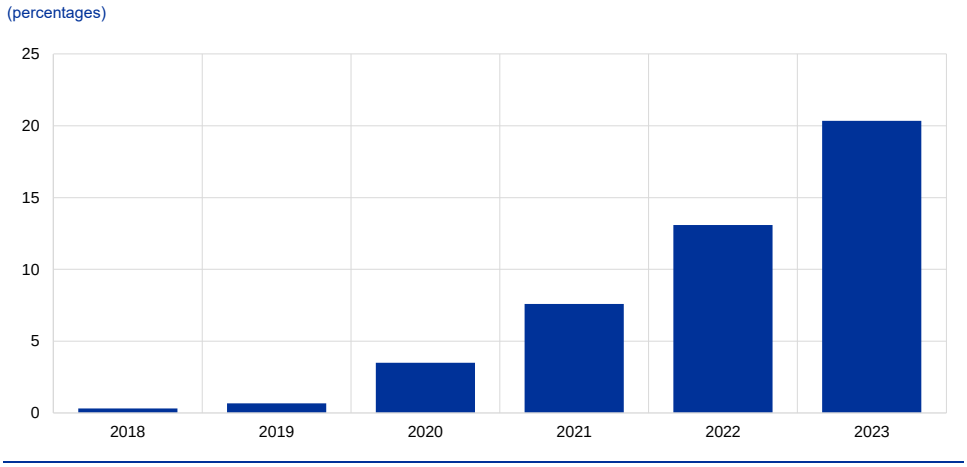
### 5.2.1 Own funds – green bond investments

The ECB's own funds portfolio provides funding for the low-carbon transition and climate solutions that contribute to decarbonising the real economy by gradually increasing its investments in green bonds. Since the launch of the green bond investment strategy, the allocation to green bonds has increased from less than 1% in 2019 to 20% in 2023 (Chart 13). The increase of 7 percentage points in 2023 reflects

the ECB's commitment to increase funding for the low-carbon transition, which amounted to €4.5 billion as at the end of 2023.

**Chart 13**

Share of green bonds in the own funds portfolio




Sources: ICMA, Bloomberg and ECB calculations.
Notes: The chart shows the share of green bonds in the own funds portfolio. The ECB relies on the labelling of the International Capital Market Association (ICMA) to identify green bonds. The calculation is based on bonds' nominal values.

The ECB's Executive Board determines annual year-end green bond target ranges for this portfolio. Throughout the year the share of green bonds is increased via secondary market purchases during the monthly portfolio rebalancing and via investments in the BIS euro-denominated green bond investment fund for central banks.

Chart 14 illustrates the green bond holdings in 2023 categorised by maturity profile, issuer type and issuer location. Of the €4.5 billion green bond investments, 68% were held in sovereign issuers, 31% in supranational and agency issuers, and 1% in corporate issuers. Around 55% of the green bond investments were held in bonds with a remaining maturity exceeding five years, providing long-term funding for the transition to a low-carbon economy. Green bond investments were heavily concentrated in euro area issuers (87%) but also benefited other EU issuers (4%).

**Chart 14**

Green bonds in the own funds portfolio by issuer type, maturity and issuer location

(percentages)


Sources: ICMA, Bloomberg and ECB calculations.
Notes: The chart shows the share of green bond holdings by issuer type, maturity bucket and issuer location. To identify green bonds, the ECB relies on the labelling of the International Capital Market Association (ICMA). The calculation is based on bonds' nominal values.

Green bonds contribute to the low-carbon transition by creating a funding advantage for issuers when compared to funding via conventional bonds. The funding advantage is referred to as the green bond premium. For the green bonds held in the own funds portfolio, ECB internal analysis shows a time-varying but persistent small green bond premium of a few basis points.

The ECB supports the development of the European Union's Green Bond Standard (EUGBS), which was adopted by the Council in October 2023 and will start to be applied as a voluntary standard towards the end of 2024.[5] The EUGBS is expected to become a leading standard for green bonds, enabling companies and public bodies to raise large-scale financing more easily for climate and environmentally conscious investments and ensure that at least 85% of the funds raised by the bond are allocated to economic activities that align with the Taxonomy Regulation, while protecting investors from greenwashing risks.

### 5.2.2 Own funds – metrics

Table 2 summarises the key climate-related metrics for the own funds portfolio in 2023. Sovereign bonds represent the largest part of the portfolio's associated

[5] See Council of the European Union, "European Green Bonds: Council adopts new regulation to promote sustainable finance", press release, 24 October 2023.

emissions and its exposure to climate risks. This is because they account for the largest portfolio share and because the scope 1 + 2 emissions of supranational, agency and covered bond issuers are comparably low owing to the service-oriented nature of their business.

The recent evolution of own funds metrics is further detailed in the following sections. The full history of metrics is presented in Annex 5 (scope 1 + 2 emissions) and Annex 6 (scope 3 emissions).

**Table 2**

Key climate-related metrics for the own funds portfolio in 2023

| | Sovereign issuers | | | | Other issuers | | |
|---|---|---|---|---|---|---|---|
| | Sovereign and sub-sovereign bonds | | | | | | |
| | Production | | | | | | |
| | excl. LULUCF | incl. LULUCF | Consumption | Government | Total | Supranational and agency bonds | Covered bonds |
| **Portfolio value (EUR million market value)** | 17 | | | | 3.3 | 2.4 | 0.9 |
| **WACI** | 137 | 131 | 10 | 61 | 1.1 | 1.2 | 0.8 |
| **Total carbon emissions** | 2,474,719 | 2,363,665 | 3,252,370 | 236,403 | 762 | 637 | 125 |
| **Carbon footprint** | 137 | 131 | 181 | 13 | 0.3 | 0.3 | 0.1 |
| **Carbon intensity** | 137 | 131 | 10 | 61 | 7.0 | 9.4 | 1.1 |

Sources: ISS, Carbon4 Finance, World Bank, Bloomberg and ECB calculations.
Notes: The table shows key metrics for the own funds portfolio per asset class. For sovereign bonds, metrics are separately provided for the production (excluding and including LULUCF), consumption and government emissions. For supranational bonds, agency bonds and covered bonds, metrics are provided on asset class and aggregate level ("Total"), based on issuers' scope 1 and scope 2 emissions. Portfolio value is expressed in € billion market value. The WACI and carbon intensity are expressed as $tCO_2e$ (tonnes of carbon dioxide equivalent) per € million revenue (other issuers), PPP-adjusted GDP (sovereign issuers, production emissions), per capita (sovereign issuers, consumption emissions), or final consumption expenditure (sovereign issuers, government emissions). Total carbon emissions are expressed as $tCO_2e$. Carbon footprint is expressed as $tCO_2e$ per € million. Metrics are calculated using market values for equities and nominal values for bonds.

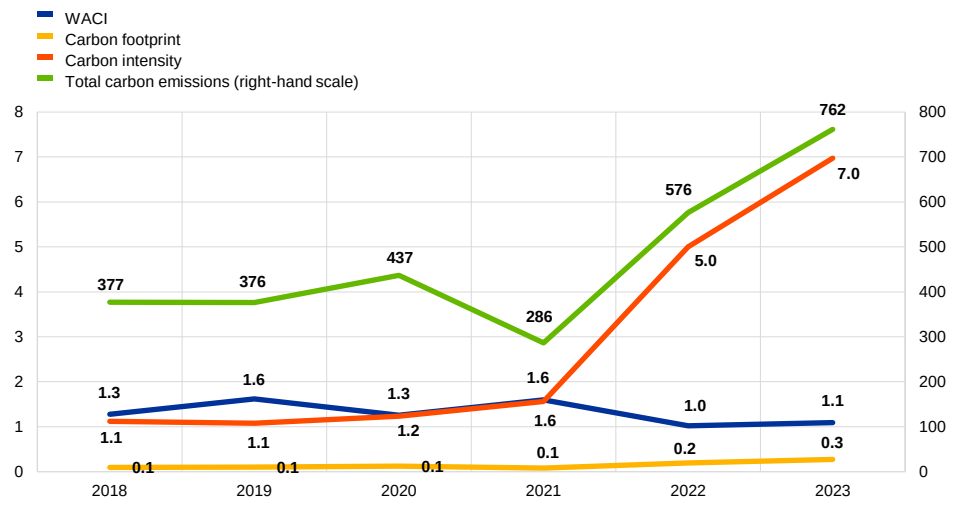
#### 5.2.2.1 Own funds – supranational, agency and covered bond investments

The ECB's internally calculated own funds' benchmark guides the monthly portfolio rebalancing and currently does not incorporate climate considerations, beyond the allocation to green bonds as a thematic investment strategy. The key metrics for supranational, agency and covered bond investments are shown in Chart 15. While the WACI of the portfolio has declined in the past two years, the increase in carbon intensity and total carbon emissions since 2021 has mostly been driven by a gradual increase in investments in the green bonds of one issuer that was not part of the portfolio prior to 2022. The resulting increase in the carbon intensity and total carbon emissions of the portfolio highlights two issues: First, investors face a potential trade-off between funding the transition of high-emitting issuers via green bond purchases and aiming to reduce the overall emissions of their investment portfolios. Second, interpreting the metrics is not always straightforward and can be complicated by the sensitivity of trends to individual investments as well as the interaction of emissions and financial data across different metrics. Between 2021 and 2023 data coverage for supranational and agency issuers increased by 8 percentage points to 89% and for covered bond issuers by 14 percentage points to 86%.

**Chart 15**

Key metrics for supranational, agency and covered bonds in the own funds portfolio

(left-hand scale: $tCO_2e$/€ millions; right-hand scale: $tCO_2e$)




Sources: ISS, Carbon4 Finance, World Bank, Bloomberg and ECB calculations.
Notes: The chart shows the changes in the four key metrics for the own funds' supranational-, agency and covered bonds based on issuers' scope 1 + 2 emissions. Metrics are calculated using bonds' nominal values. Changes compared to the metrics reported in the previous years' report may be related to improved data availability or to a retrospective revision of issuers' emissions or financial data.

### 5.2.2.2 Own funds – sovereign investments

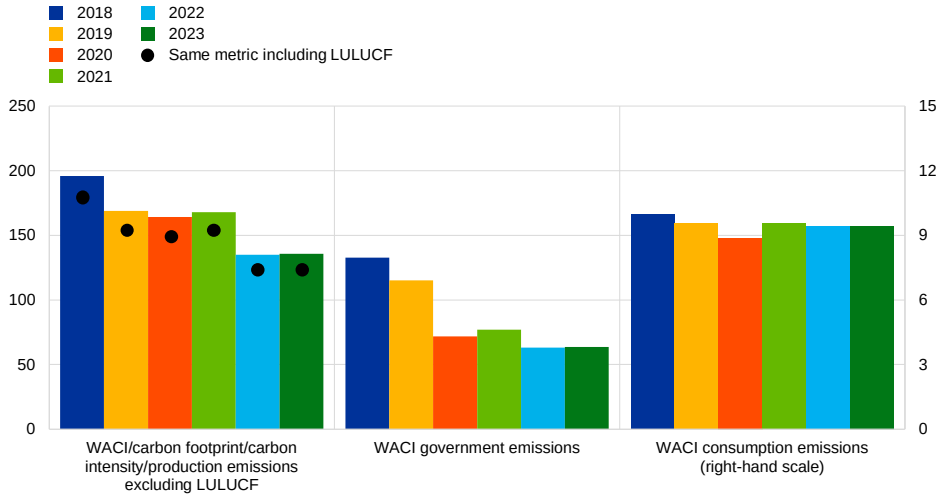
All sovereign issuers held in the own funds portfolio are signatories to the Paris Agreement and have committed to decarbonising their economies in line with its goals.

The evolution of key metrics for sovereign bonds held in the own funds portfolio (Chart 16) is similar to that of sovereign bonds held in the staff pension fund. Between 2021 and 2023 the WACI, carbon footprint and carbon intensity based on production emissions and for government emissions declined by around 19%, while the WACI for consumption emissions remained stable. The results should be interpreted with caution, as the temporary distorting effects of the pandemic, the two-year delay in the release of sovereign emissions data and the absence of a targeted decarbonisation strategy mean that the metrics move in a rather arbitrary manner.

**Chart 16**

Evolution of key metrics for sovereign bond investments in the own funds' portfolio

(left-hand scale: $tCO_2e$/€ millions; right-hand scale: $tCO_2e$/population)



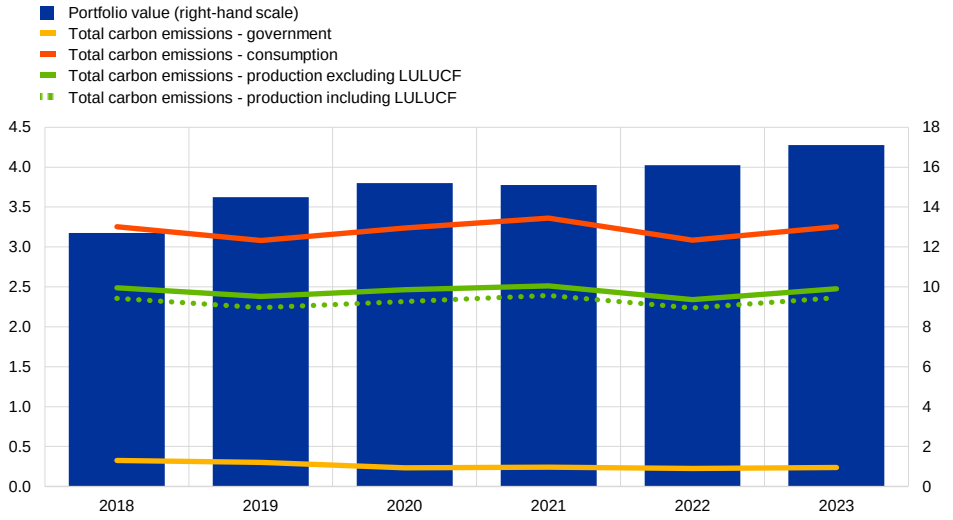

Sources: ISS, Carbon4 Finance, World Bank, Bloomberg and ECB calculations.
Notes: The WACI is illustrated for production-, consumption-, and government emissions. Production and government emissions are based on ISS data; consumption emissions are based on Carbon4 Finance data. Production emissions are reported excluding and including the effects of LULUCF. The WACI is denominated in $tCO_2e$ per € millions GDP (production emissions), $tCO_2e$ per € million government consumption (government emissions) and $tCO_2e$ per capita (consumption emissions). Metrics are calculated using bonds' nominal values. Underlying holdings refer to year-end values. Changes compared to the metrics reported in last years' report may be related to improved data availability or to a retrospective revision of issuers' emissions or financial data.

Between 2021 and 2023 the total carbon emissions based on production emissions (excluding and including LULUCF), consumption emissions, and government emissions declined marginally (Chart 17). The level of consumption emissions exceeds that of production emissions, which shows that the euro area countries held in the own funds portfolio are, on aggregate, net carbon importers.

## Chart 17

Total carbon emissions of sovereign bond investments in the own funds portfolio

(left-hand scale: millions $tCO_2e$; right-hand scale: € billions)



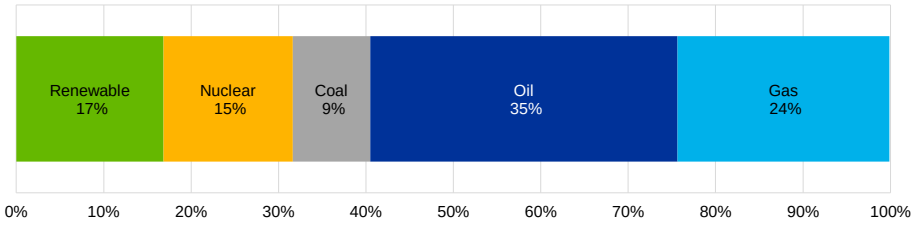

Sources: ISS, Carbon4 Finance, World Bank, Bloomberg, UNFCCC and ECB calculations.
Notes: Production and government emissions are based on ISS data; consumption emissions are based on Carbon4 Finance data. Production emissions are reported excluding and including the effects of LULUCF. Metrics are calculated using bonds' nominal values. Underlying holdings refer to year-end values. Changes compared to the metrics reported in last years' report may be related to improved data availability or to a retrospective revision of issuers' emissions or financial data.

Chart 18 shows the weighted average total energy supply mix of the sovereign bond issuers in the own funds portfolio in 2023. Renewable energy and low-carbon nuclear energy together account for around one-third of total energy supply; while fossil fuels including coal, oil and gas account for two-thirds of total energy supply.

## Chart 18

Total energy supply mix of sovereign bond issuers in the own funds portfolio

(percentages)




Sources: ISS and ECB calculations.
Notes: The chart shows the weighted average energy mix of the sovereign bond issuers in the own funds portfolio in 2023. Weighting is conducted using bonds' nominal values. Total energy supply represents the quantity of all energy necessary to satisfy inland consumption. It is defined as Total energy supply = production + imports - exports - international marine bunkers - international aviation bunkers +/- stock changes.

## 5.3 Targets

The TCFD recommends disclosing targets to manage climate risks. Emissions reduction targets help to reduce portfolios' exposure to climate transition risks and to decrease portfolios' environmental footprint over time.

The ECB aims to reduce the emissions associated with its staff pension fund and its own funds portfolio in line with the goals of the Paris Agreement and the European Climate Law.

To that end, in the staff pension fund, the EU Paris-aligned benchmarks for corporate investments (including equity and corporate bond holdings, accounting for around 75% of total pension fund assets) are expected to further reduce the carbon footprint (based on scope 1 + 2 emissions) of these investments by an annual average of at least 7% after 2023, in line with the minimum requirements for these benchmarks. At this pace, the ECB expects the carbon footprint of its staff pension fund to further decline by at least 40% until 2030 and by at least 70% until 2040, compared with 2023.

This target will support the gradual reduction of the pension fund's exposure to climate transition risks in support of the European Climate Law. The target does not apply to sovereign bond holdings, which will decarbonise over time as sovereigns deliver on their commitments as signatories to the Paris Agreement.

In its own funds portfolio, the ECB aims to further step up its funding of the low-carbon transition by increasing the share of green bonds. By the end of 2024, the ECB aims to increase the green bond share to at least 25%.

The ECB will continue to monitor evolving climate science and guidance on (interim) target-setting. It maintains full flexibility to adjust its existing targets and to expand them to additional asset classes in the future, reflecting the Eurosystem's growing experience with climate-related financial disclosures.

Targets will continue to reflect portfolio-specific objectives and constraints including the portfolio's duration target, expected green bond issuance volumes, liquidity conditions and issuer and bond specific risk limits.

# Annexes

## Annex 1

The Eurosystem disclosure framework for the TCFD category “Metrics and targets”

| Element | Details |
|---|---|
| **Weighted average carbon intensity (WACI)** | $= \sum_{n}^{i} \left( \frac{\text{current value of investment}_i}{\text{current portfolio value}} \right) \text{x} \left( \frac{\text{issuer's carbon emissions}_i}{\text{issuer's revenue, PPP adj. GDP, population, or final consumption expenditure}_i} \right) t$ |
| **Total carbon emissions** | $= \sum_{n}^{i} \left( \frac{\text{current value of investment}_i}{\text{EVIC or PPP adj. GDP}_i} \text{x issuer's carbon emissions}_i \right)$ |
| **Carbon footprint** | $= \frac{\sum_{n}^{i} \left( \frac{\text{current value of investment}_i}{\text{EVIC or PPP adj. GDP}_i} \right) \text{x issuer's carbon emissions}_i}{\text{current portfolio value}}$ |
| **Green bond share** | Of fixed-income portfolios based on ICMA's Green Bond Principles. |
| **Portfolio size** | Expressed in € billions. |
| **Asset classes** | All asset classes of the portfolio, with metrics to be shown per asset class. |
| **Data availability** | Indicated in brackets as a percentage for each metric and asset class. |
| **Data sources** | Such as the names of the (climate) data providers. |
| **Target** | At least one broadly defined long-term target covering all NMPPs under management control of the central bank, that is aligned with the goals of the Paris Agreement and the EU's climate neutrality objectives. Targets can be set at portfolio level, central bank level, or a combination of both. Targets should ideally be quantitative, and long-term targets should ideally be enriched by interim targets. |

Notes: TCFD formulas are provided here. For the Eurosystem disclosure framework, they have been adjusted where necessary to reflect the latest PCAF guidance and cover additional asset classes.

In addition to the elements of the Eurosystem disclosure framework, the ECB publishes the carbon intensity metric, which is defined as:

$$\text{Carbon Intensity} = \frac{\sum_{n}^{i} \left( \frac{\text{current value of investment}_i}{\text{EVIC or PPP adj. GDP}_i} \right) \text{x issuer's carbon emissions}_i}{\sum_{n}^{i} \left( \frac{\text{current value of investment}_i}{\text{EVIC or PPP adj. GDP}_i} \text{x} \begin{matrix} \text{issuer's revenue, PPP adj. GDP,} \\ \text{population, or final consumption} \\ \text{expenditure} \end{matrix} \right)_i}$$

## Annex 2

## Carbon emissions allocation methods, normalisation factors and attribution factors

### Allocation

| Issuer type | Factor | Remarks | Unit |
|---|---|---|---|
| **Corporate**<br>**Supra & agency** | Scope 1, 2 and 3 emissions | Scope 1 comprises direct carbon emissions that occur from sources that are controlled or owned by an organisation (e.g., emissions associated with fuel combustion in boilers, furnaces, vehicles). Scope 2 comprises indirect carbon emissions associated with the purchase of electricity, steam, heat, or cooling. Scope 3 emissions are the result of activities from assets not owned or controlled by the reporting organisation, but that the organisation indirectly affects in its value chain. They often represent the majority of an organisation's total greenhouse gas (GHG) emissions. | $tCO_2e$ |
| **Sovereign** | Production emissions | Emissions produced domestically within a country's physical borders, including domestic consumption and exports. This definition follows the territorial emissions approach adopted by United Nations Framework Convention on Climate Change (UNFCCC) for annual national inventories. Production emissions are reported including and excluding the effects of land use, land-use change and forestry (LULUCF) because the rate of build-up of carbon dioxide in the atmosphere is affected by changes to vegetation and soils in terrestrial ecosystems. | $tCO_2e$ |
| | Consumption emissions | Emissions related to domestic demand, accounting for trade effects. This metric provides a broader view of a sovereign's emissions and tackles the issue of carbon leakage that arises due to production shifts from countries where goods are consumed later. | $tCO_2e$ |
| | Government emissions | Direct emissions (e.g. from buildings, vehicles) and indirect emissions (e.g. emissions related to energy consumption, but also expenditures, subsidies and investments) of the central government. | $tCO_2e$ |

### Normalisation

| Issuer type | Factor | Remarks | Unit |
|---|---|---|---|
| **Corporate**<br>**Supra & agency** | Revenue | The total amount of income generated by the sale of goods and services related to the primary operations of the business. Commercial revenue may also be referred to as sales or as turnover. | € millions |
| **Sovereign** | Production: PPP adj. GDP | GDP is the sum of gross value added by all resident producers plus any product taxes and minus any subsidies not included in the value of the products. The purchasing power parity (PPP) conversion factor is a spatial price deflator and currency converter that eliminates effects of differences in countries' price levels. | € millions |
| | Consumption: Population | Total population of a country. | People |
| | Government: Final consumption expenditure | General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defence and security but excludes government military expenditures that are part of government capital formation. | € millions |

### Attribution

| Asset class | Factor | Remarks | Unit |
|---|---|---|---|
| **Sovereign bonds** | PPP adj. GDP | See description of "PPP adj. GDP" in normalisation factor. | € |
| **Equities**<br>**Supra & agency bonds**<br>**Corporate bonds**<br>**Covered bonds** | EVIC | The sum of the market capitalisation of ordinary shares at fiscal year-end, the market capitalisation of preferred shares at fiscal year-end, and the book values of total debt and minorities' interests. | € |

## Annex 3

Climate-related TCFD metrics for the **ECB's staff pension fund** from 2017 to 2023 – scope 1 + 2 emissions

**Portfolio value (EUR million market value)**

| | Sovereign issuers | | | | Corporate issuers | | |
|---|---|---|---|---|---|---|---|
| | Sovereign and sub-sovereign bonds | | | | | | |
| | Production | | | | | | |
| Pension fund | excl. LULUCF | incl. LULUCF | Consumption | Government | Total | Bonds | Equities |
| 2023 | | | 523 | | 1,502 | 126 | 1,376 |
| 2022 | | | 479 | | 1,331 | 119 | 1,212 |
| 2021 | | | 502 | | 1,482 | 121 | 1,361 |
| 2020 | | | 433 | | 1,204 | 103 | 1,101 |
| 2019 | | | 402 | | 1,070 | 97 | 973 |
| 2018 | | | 343 | | 813 | 81 | 732 |
| 2017 | | | 323 | | 825 | 76 | 749 |

**WACI (tCO2e/EUR million revenue, GDP, consumption expenditure or per capita)**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2023 | 136 | 128 | 9.4 | 63 | 46 | 69 | 43 |
| | 100% | 100% | 100% | 100% | 100% | 98% | 100% |
| 2022 | 135 | 128 | 9.4 | 63 | 77 | 82 | 77 |
| | 100% | 100% | 100% | 100% | 100% | 98% | 100% |
| 2021 | 168 | 159 | 10 | 77 | 97 | 149 | 92 |
| | 100% | 100% | 100% | 100% | 99% | 95% | 100% |
| 2020 | 164 | 154 | 8.9 | 72 | 118 | 174 | 112 |
| | 100% | 100% | 100% | 100% | 99% | 95% | 100% |
| 2019 | 169 | 158 | 10 | 115 | 213 | 214 | 213 |
| | 100% | 100% | 100% | 100% | 96% | 63% | 99% |
| 2018 | 196 | 184 | 10 | 133 | 243 | 147 | 250 |
| | 100% | 100% | 100% | 100% | 95% | 60% | 100% |
| 2017 | 201 | 192 | 10 | 136 | 238 | 158 | 244 |
| | 100% | 100% | 100% | 100% | 95% | 60% | 99% |

**Total carbon emissions (in tCO2e)**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2023 | 64,365 | 60,872 | 83,575 | 6,426 | 22,370 | 4,020 | 18,350 |
| | 100% | 100% | 100% | 100% | 99% | 95% | 100% |
| 2022 | 68,331 | 64,613 | 88,940 | 6,808 | 48,893 | 4,886 | 44,007 |
| | 100% | 100% | 100% | 100% | 99% | 95% | 100% |
| 2021 | 72,601 | 68,711 | 94,597 | 7,214 | 53,642 | 6,978 | 46,663 |
| | 100% | 100% | 100% | 100% | 99% | 88% | 100% |
| 2020 | 59,380 | 55,571 | 76,372 | 5,797 | 53,842 | 8,338 | 45,504 |
| | 100% | 100% | 100% | 100% | 99% | 90% | 100% |
| 2019 | 57,523 | 53,880 | 72,709 | 7,847 | 110,586 | 7,768 | 102,818 |
| | 100% | 100% | 100% | 100% | 96% | 62% | 99% |
| 2018 | 59,679 | 56,037 | 75,673 | 8,129 | 100,910 | 6,342 | 94,568 |
| | 100% | 100% | 100% | 100% | 94% | 59% | 99% |
| 2017 | 55779 | 53381 | 68651 | 7631 | 111,090 | 6,413 | 104,677 |
| | 100% | 100% | 100% | 100% | 95% | 60% | 99% |

### Carbon footprint (tCO2e per EUR million invested)

| Pension fund | Sovereign issuers | | | | Corporate issuers | | |
|---|---|---|---|---|---|---|---|
| | Sovereign and sub-sovereign bonds | | | | | | |
| | Production | | | | | | |
| | excl. LULUCF | incl. LULUCF | Consumption | Government | Total | Bonds | Equities |
| **2023** | 136 | 128 | 176 | 14 | 14 | 25 | 13 |
| | 100% | 100% | 100% | 100% | 99% | 95% | 100% |
| **2022** | 135 | 128 | 176 | 13 | 38 | 34 | 38 |
| | 100% | 100% | 100% | 100% | 99% | 95% | 100% |
| **2021** | 168 | 159 | 219 | 17 | 38 | 59 | 36 |
| | 100% | 100% | 100% | 100% | 99% | 88% | 100% |
| **2020** | 164 | 154 | 211 | 16 | 47 | 82 | 43 |
| | 100% | 100% | 100% | 100% | 99% | 90% | 100% |
| **2019** | 169 | 158 | 214 | 23 | 111 | 117 | 111 |
| | 100% | 100% | 100% | 100% | 96% | 62% | 99% |
| **2018** | 196 | 184 | 248 | 27 | 134 | 110 | 136 |
| | 100% | 100% | 100% | 100% | 94% | 59% | 99% |
| **2017** | 201 | 192 | 247 | 27 | 145 | 120 | 147 |
| | 100% | 100% | 100% | 100% | 95% | 60% | 99% |

### Carbon intensity (tCO2e/EUR million revenue, GDP, consumption expenditure or per capita)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **2023** | 136 | 128 | 9.2 | 63 | 41 | 73 | 37 |
| | 100% | 100% | 100% | 100% | 99% | 95% | 100% |
| **2022** | 135 | 128 | 9.2 | 62 | 89 | 99 | 87 |
| | 100% | 100% | 100% | 100% | 99% | 95% | 100% |
| **2021** | 168 | 159 | 9.3 | 76 | 109 | 167 | 104 |
| | 100% | 100% | 100% | 100% | 99% | 88% | 100% |
| **2020** | 164 | 154 | 8.7 | 71 | 117 | 222 | 108 |
| | 100% | 100% | 100% | 100% | 99% | 90% | 100% |
| **2019** | 169 | 158 | 9.4 | 113 | 264 | 287 | 262 |
| | 100% | 100% | 100% | 100% | 96% | 62% | 99% |
| **2018** | 196 | 184 | 9.8 | 130 | 279 | 249 | 282 |
| | 100% | 100% | 100% | 100% | 94% | 59% | 99% |
| **2017** | 201 | 192 | 9.8 | 133 | 266 | 248 | 267 |
| | 100% | 100% | 100% | 100% | 95% | 60% | 99% |

Sources: ISS, Carbon4 Finance, World Bank, Bloomberg and ECB calculations.
Notes: Percentages below each metric indicate data availability, calculated as the percentage of investments for which all required data (i.e. emissions data and financial data) are available. Additionally, in all tables, the portfolio value "Total" includes all assets, also those excluded from reporting such as cash and derivatives. As such, its value may deviate from the sum of the portfolio values of the reported asset classes.

## Annex 4

Climate-related TCFD metrics for the **ECB's staff pension fund** from 2020 to 2023 – scope 3 emissions

**WACI (scope 3 in tCO2e/EUR million revenue)**

| | Total | Corporate bonds | Equities |
|---|---|---|---|
| **2023** | 772 | 1,034 | 743 |
| | 100% | 98% | 100% |
| **2022** | 1,111 | 1,068 | 1,116 |
| | 100% | 98% | 100% |
| **2021** | 1,003 | 1,097 | 994 |
| | 99% | 95% | 100% |
| **2020** | 882 | 1,056 | 865 |
| | 99% | 95% | 100% |

**Total carbon emissions (scope 3 in tCO2e)**

| | | | |
|---|---|---|---|
| **2023** | 439,070 | 51,442 | 387,628 |
| | 99% | 95% | 100% |
| **2022** | 768,959 | 48,619 | 720,340 |
| | 99% | 95% | 100% |
| **2021** | 673,005 | 53,771 | 619,234 |
| | 99% | 88% | 100% |
| **2020** | 570,881 | 47,219 | 523,662 |
| | 99% | 90% | 100% |

**Carbon intensity (scope 3 in tCO2e/EUR million revenue)**

| | | | |
|---|---|---|---|
| **2023** | 806 | 935 | 792 |
| | 99% | 95% | 100% |
| **2022** | 1,383 | 981 | 1,431 |
| | 99% | 95% | 100% |
| **2021** | 1,372 | 1,285 | 1,379 |
| | 99% | 88% | 100% |
| **2020** | 1,239 | 1,260 | 1,237 |
| | 99% | 90% | 100% |

**Carbon footprint (scope 3 in tCO2e per EUR million invested)**

| | | | |
|---|---|---|---|
| **2023** | 272 | 314 | 267 |
| | 99% | 95% | 100% |
| **2022** | 595 | 338 | 626 |
| | 99% | 95% | 100% |
| **2021** | 475 | 455 | 477 |
| | 99% | 88% | 100% |
| **2020** | 496 | 467 | 499 |
| | 99% | 90% | 100% |

Sources: ISS, Carbon4 Finance, World Bank, Bloomberg and ECB calculations.
Notes: Percentages below each metric indicate data availability, calculated as the percentage of investments for which all required data (i.e. emissions data and financial data) are available. Scope 3 emissions are reported only as of 2020 owing to a methodological change in that year which prevents cross-year - comparison. Scope 3 emissions are reported separately from scope 1 + 2 emissions owing to their much higher estimation uncertainty. Additionally, the separate reporting enables an easier understanding for the difference in magnitude of metrics.

## Annex 5

Climate-related TCFD metrics of the **ECB's own funds** for 2017 to 2023 – scope 1 + scope 2 emissions

**Portfolio value (EUR billion market value)**

| | Sovereign issuers | | | | Other issuers | | |
|---|---|---|---|---|---|---|---|
| | Sovereign and sub-sovereign bonds | | | | | | |
| | Production | | | | | | |
| Own funds | excl. LULUCF | incl. LULUCF | Consumption | Government | Total | Supranational and agency bonds | Covered bonds |
| 2023 | | | 17.1 | | 3.3 | 2.4 | 0.9 |
| 2022 | | | 16.1 | | 3.2 | 2.2 | 1.0 |
| 2021 | | | 15.1 | | 3.8 | 2.3 | 1.5 |
| 2020 | | | 15.2 | | 4.3 | 2.2 | 2.1 |
| 2019 | | | 14.5 | | 5.0 | 2.2 | 2.8 |
| 2018 | | | 12.7 | | 5.3 | 2.4 | 2.9 |
| 2017 | | | 13.2 | | 5.2 | 2.7 | 2.5 |

**WACI (tCO2e/EUR million revenue, GDP, consumption expenditure or per capita)**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2023 | 137 | 131 | 10 | 61 | 1.1 | 1.2 | 0.8 |
| | 100% | 100% | 100% | 100% | 92% | 89% | 100% |
| 2022 | 137 | 131 | 10 | 61 | 1.0 | 1.1 | 0.9 |
| | 100% | 100% | 100% | 100% | 92% | 88% | 100% |
| 2021 | 169 | 161 | 10 | 75 | 1.6 | 1.5 | 1.7 |
| | 100% | 100% | 100% | 100% | 98% | 96% | 100% |
| 2020 | 164 | 154 | 9.3 | 69 | 1.3 | 0.6 | 1.9 |
| | 100% | 100% | 100% | 100% | 93% | 90% | 96% |
| 2019 | 170 | 160 | 10 | 108 | 1.6 | 0.5 | 2.8 |
| | 100% | 100% | 100% | 100% | 76% | 95% | 62% |
| 2018 | 203 | 192 | 11 | 134 | 1.3 | 0.8 | 1.8 |
| | 100% | 100% | 100% | 100% | 75% | 91% | 63% |
| 2017 | 204 | 192 | 11 | 134 | 0.5 | 0.5 | 0.7 |
| | 100% | 100% | 100% | 100% | 51% | 83% | 20% |

**Total carbon emissions (in tCO2e)**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2023 | 2,474,719 | 2,363,665 | 3,252,370 | 236,403 | 762 | 637 | 125 |
| | 100% | 100% | 100% | 100% | 88% | 89% | 86% |
| 2022 | 2,340,118 | 2,236,118 | 3,085,492 | 223,971 | 576 | 379 | 197 |
| | 100% | 100% | 100% | 100% | 84% | 83% | 87% |
| 2021 | 2,510,469 | 2,392,266 | 3,359,369 | 241,155 | 286 | 91 | 195 |
| | 100% | 100% | 100% | 100% | 77% | 81% | 72% |
| 2020 | 2,465,861 | 2,314,045 | 3,237,090 | 234,568 | 437 | 13 | 424 |
| | 100% | 100% | 100% | 100% | 89% | 82% | 95% |
| 2019 | 2,378,678 | 2,241,371 | 3,082,531 | 303,227 | 376 | 26 | 350 |
| | 100% | 100% | 100% | 100% | 68% | 95% | 49% |
| 2018 | 2,488,875 | 2,356,629 | 3,254,933 | 323,763 | 377 | 22 | 354 |
| | 100% | 100% | 100% | 100% | 70% | 91% | 55% |
| 2017 | 2,593,977 | 2,447,443 | 3,377,330 | 344,750 | 79 | 38 | 41 |
| | 100% | 100% | 100% | 100% | 51% | 83% | 20% |

### Carbon footprint (tCO2e per EUR million invested)

| | Sovereign issuers | | | | Other issuers | | |
|---|---|---|---|---|---|---|---|
| | Sovereign and sub-sovereign bonds | | | | | | |
| | Production | | | | | | |
| Own funds | excl. LULUCF | incl. LULUCF | Consumption | Government | Total | Supranational and agency bonds | Covered bonds |
| 2023 | 137 | 131 | 181 | 13 | 0.3 | 0.3 | 0.1 |
| | 100% | 100% | 100% | 100% | 88% | 89% | 86% |
| 2022 | 137 | 131 | 180 | 13 | 0.2 | 0.2 | 0.2 |
| | 100% | 100% | 100% | 100% | 84% | 83% | 87% |
| 2021 | 169 | 161 | 227 | 16 | 0.1 | 0.0 | 0.1 |
| | 100% | 100% | 100% | 100% | 77% | 81% | 72% |
| 2020 | 164 | 154 | 216 | 16 | 0.1 | 0.0 | 0.2 |
| | 100% | 100% | 100% | 100% | 89% | 82% | 95% |
| 2019 | 170 | 160 | 220 | 22 | 0.1 | 0.0 | 0.2 |
| | 100% | 100% | 100% | 100% | 68% | 95% | 49% |
| 2018 | 203 | 192 | 266 | 26 | 0.1 | 0.0 | 0.2 |
| | 100% | 100% | 100% | 100% | 70% | 91% | 55% |
| 2017 | 204 | 192 | 266 | 27 | 0.0 | 0.0 | 0.1 |
| | 100% | 100% | 100% | 100% | 51% | 83% | 20% |

### Carbon intensity (tCO2e/EUR million revenue, GDP, consumption expenditure or per capita)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2023 | 137 | 131 | 10 | 61 | 7.0 | 9.4 | 1.1 |
| | 100% | 100% | 100% | 100% | 88% | 89% | 86% |
| 2022 | 137 | 131 | 10 | 61 | 5.0 | 7.0 | 1.3 |
| | 100% | 100% | 100% | 100% | 84% | 83% | 87% |
| 2021 | 169 | 161 | 10 | 75 | 1.6 | 1.6 | 1.5 |
| | 100% | 100% | 100% | 100% | 77% | 81% | 72% |
| 2020 | 164 | 154 | 9.0 | 69 | 1.2 | 0.3 | 2.1 |
| | 100% | 100% | 100% | 100% | 89% | 82% | 95% |
| 2019 | 170 | 160 | 10 | 105 | 1.1 | 0.2 | 2.2 |
| | 100% | 100% | 100% | 100% | 68% | 95% | 49% |
| 2018 | 203 | 192 | 10 | 130 | 1.1 | 0.2 | 2.2 |
| | 100% | 100% | 100% | 100% | 70% | 91% | 55% |
| 2017 | 204 | 192 | 11 | 131 | 0.5 | 0.4 | 0.8 |
| | 100% | 100% | 100% | 100% | 51% | 83% | 20% |

Sources: ISS, C4F, World Bank, Bloomberg and ECB calculations.
Notes: Percentages below each metric indicate data availability, calculated as the percentage of investments for which all required data (i.e. emissions data and financial data) are available. Additionally, in all tables, the portfolio value "Total" includes all assets, also those excluded from reporting such as cash and derivatives. As such, its value may deviate from the sum of the portfolio values of the reported asset class.

## Annex 6

Climate-related TCFD metrics of the ECB's own funds for 2020 to 2023 – scope 3 emissions

**WACI (scope 3 in tCO2e/EUR million revenue)**

| | Total | Supranational and agency bonds | Covered bonds |
|---|---|---|---|
| 2023 | 1,383 | 1,386 | 1,377 |
| | 92% | 89% | 100% |
| 2022 | 1,324 | 1,308 | 1,353 |
| | 92% | 88% | 100% |
| 2021 | 487 | 317 | 727 |
| | 98% | 96% | 100% |
| 2020 | 470 | 343 | 587 |
| | 93% | 90% | 96% |

**Total carbon emissions (scope 3 in tCO2e)**

| | | | |
|---|---|---|---|
| 2023 | 254,245 | 87,310 | 166,935 |
| | 88% | 89% | 86% |
| 2022 | 287,733 | 71,036 | 216,697 |
| | 84% | 83% | 87% |
| 2021 | 100,379 | 18,917 | 81,462 |
| | 77% | 81% | 72% |
| 2020 | 116,667 | 17,313 | 99,354 |
| | 89% | 82% | 95% |

**Carbon intensity (scope 3 in tCO2e/EUR million revenue)**

| | | | |
|---|---|---|---|
| 2023 | 1,326 | 1,291 | 1,412 |
| | 88% | 89% | 86% |
| 2022 | 1,340 | 1,303 | 1,410 |
| | 84% | 83% | 87% |
| 2021 | 444 | 326 | 640 |
| | 77% | 81% | 72% |
| 2020 | 419 | 345 | 482 |
| | 89% | 82% | 95% |

**Carbon footprint (scope 3 in tCO2e per EUR million invested)**

| | | | |
|---|---|---|---|
| 2023 | 85 | 45 | 180 |
| | 88% | 89% | 86% |
| 2022 | 95 | 38 | 203 |
| | 84% | 83% | 87% |
| 2021 | 27 | 9.3 | 57 |
| | 77% | 81% | 72% |
| 2020 | 33 | 9.9 | 52 |
| | 89% | 82% | 95% |

Sources: ISS, Carbon4 Finance, World Bank, Bloomberg and ECB calculations.
Notes: Percentages below each metric indicate data availability, calculated as the percentage of investments for which all required data (i.e. emissions data and financial data) are available. Scope 3 emissions are reported only since 2020 owing to a methodological change in that year which prevents cross-year comparison. Scope 3 emissions are reported separately from scope 1 + 2 emissions owing to their much higher estimation uncertainty. Additionally, the separate reporting enables an easier understanding for the difference in magnitude of metrics.

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For specific terminology please refer to the ECB glossary (available in English only).

PDF ISBN 978-92-899-6774-7, ISSN 2811-7018, doi:10.2866/293793, QB-DA-24-001-EN-N