

# Climate-related financial disclosures by the Oesterreichische Nationalbank 2023

Part of the Eurosystem-wide climate-related financial disclosures  
on non-monetary policy portfolios (NMPPs)

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*Cutoff date: April 30, 2024*

## 1 Introduction

The transition toward a climate-neutral economy requires comprehensive efforts from market participants. This means that governments and private sector companies are required to take measures supporting the transition, and central banks are also committed to doing their part. One success factor for achieving climate targets are, for instance, relative prices. Transparent reporting by market participants and thus also by central banks is essential going forward.

Sustainability is relevant in a broad range of areas and thus interdisciplinary by nature. This is also why sustainability topics are addressed by various functions at the OeNB. These functions implement environmental, social and governance (ESG) criteria and contribute to the work of both OeNB and international bodies.

Therefore, sustainability has a growing importance for the OeNB's corporate and investment activities. For an overview of the OeNB's sustainability activities, see the [OeNB's Annual Report 2023](#) or visit the [Sustainability and ESG section](#) on the OeNB's website.

In February 2021, the Eurosystem announced that it aimed to start making annual climate-related financial disclosures for its euro-denominated non-monetary policy portfolios (NMPPs) within two years.<sup>1</sup> To this end, the Eurosystem central banks defined a common stance for applying sustainable and responsible investment principles to the NMPPs that they each manage under their own responsibility. The common agreement, which followed extensive preparatory work within the Eurosystem, had also benefited from the analysis of the Network for Greening the Financial System (NGFS) and is aligned with its recommendations.

In 2023, the common Eurosystem approach was further improved and expanded. For example, this report now includes a metric for the green bond share, and the currency spectrum is no longer limited to euro-denominated securities.

This report presents the OeNB's second annual climate-related financial disclosures for its NMPPs and is structured around the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), which rest on four pillars: (1) governance, (2) strategy, (3) risk management and (4) metrics and targets.

<sup>1</sup> *ECB press release of February 4, 2021.*

## 2 Governance

The OeNB's governance<sup>2</sup> is largely determined by the Federal Act on the Oesterreichische Nationalbank (Nationalbank Act), the Treaty on the Functioning of the European Union (TFEU), and the Statute of the ESCB and of the ECB. Within this framework and based on Austria's Federal Public Corporate Governance Code, the OeNB has developed its own corporate governance code to reinforce its statutory independence. This code was last revised in 2018. Moreover, the OeNB publishes [annual corporate governance reports](#) in German on its website.

### 2.1 Compliance management system

To ensure and strengthen good governance, the OeNB has set up a compliance management system (CMS) and a risk management system. The CMS reflects to a large extent ECB guidelines that lay down the principles of the ethics framework for the Eurosystem and for the Single Supervisory Mechanism. Among other things, the CMS includes a preventive system with anti-corruption measures and an electronic whistleblowing system.

### 2.2 Enterprise risk management system

The OeNB moreover relies on an enterprise risk management system to capture and assess compliance and legal as well as financial and operational risks. In this respect, the OeNB puts great emphasis on limiting risks. Risks related to environmental, social and governance (ESG) factors, added explicitly to the risk catalogue in 2022, are treated as a horizontal issue.

### 2.3 IT governance and security

In response to the rise in cyber threats, the OeNB has enhanced its IT policies and strengthened cyber security within its information security management system. The OeNB has been focusing on five areas: (1) raising awareness among staff of current information security risks, (2) investing in technical innovations in IT security, (3) continuously modernizing its IT systems, (4) installing an enterprise Chief Information Security Officer (CISO) and (5) implementing the Eurosystem's cyber resilience requirements.

Hence, various OeNB functions are accountable for ESG topics and contribute to the work of both OeNB and international bodies (figure 1). We follow a clear structure in fulfilling our tasks in the area of ecological sustainability.

<sup>2</sup> *Decision-making bodies - Oesterreichische Nationalbank (OeNB).*

Figure 1

## OeNB promotes sustainability across all business areas



Source: OeNB.

### 3 Strategy

The OeNB keeps an eye on how its activities impact on society and the environment – with a view to promoting sustainable development in Austria and beyond. According to the United Nations' 1987 [Brundtland Report](#), "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

In the financial sector, and when it comes to sustainability reporting more generally, sustainability tends to be broken down into environmental, social, and governance (ESG) factors:

- Environmental factors cover, for instance, climate protection, resource efficiency, and the use of renewable energy sources. In this respect, the OeNB intends to reduce air and wastewater emissions as well as its ecological footprint.
- Social factors include creating fair working conditions, respecting human rights, and investing in employees' training, job security and health.
- Corporate governance measures are designed to prevent corruption or market distortion, e.g. through independent oversight bodies, and to incentivize sustainable behavior.

### The OeNB's mission and values<sup>3</sup>

- *Our endeavors are founded on technical expertise and social competence, transparency, ethical values and responsible corporate governance.*
- *We welcome change and embrace forward thinking.*
- *Our staff and their knowledge, skills and commitment are our biggest asset.*
- *We are an equal opportunity employer, value diversity and assist our employees in combining a career with family life.*
- *Our social responsibility is also reflected in our support for science and research, humanitarian concerns, art, culture and environmental protection.*

### 3.1 The OeNB's corporate sustainability strategy

Sustainability is an intrinsic part of what the OeNB does, and of how it seeks to deliver on its mandate, also taking into account economic considerations and risk adequacy.

Stability, security and trust guide the OeNB in fulfilling its responsibility toward society. These principles are reflected in the OeNB's corporate governance, which is geared toward sustainability. The OeNB is committed to protecting the environment and contributing to the fight against climate change. To this end, the OeNB implemented an environmental management system in accordance with the EU's Eco-Management and Audit Scheme (EMAS) in 1998. It was extended to all OeNB locations in 2001 and 2002. These measures help the OeNB improve its environmental performance by curbing its carbon footprint.

Climate change is the greatest challenge of our time. The effects are already clearly noticeable in Austria, but the main burden will be borne by future generations worldwide. For the future of Austria, Europe and the world, it is essential to address the issues of climate change, social responsibility and transparency.

Recognizing these key challenges of our time, the OeNB supports the goals of both the Paris Agreement to limit global warming to 1.5°C and the European Green Deal.<sup>4</sup> The OeNB has been keen to transition to an environmentally friendly circular economy. This is why its operational ecology agenda prioritizes reducing pollution and cutting greenhouse gas emissions.

Striving to make its operational activities fully carbon neutral, the OeNB has been implementing dedicated projects aimed at becoming a climate neutral enterprise by 2040.

### 3.2 Sustainable and responsible investment strategy

When managing its reserves, the OeNB has been taking specific sustainability criteria into account for many years. Since 2011, external asset managers making investments on behalf of the OeNB must have signed the Principles for Responsible Investment endorsed by the United Nations. In addition to addressing ESG factors, these principles also provide for responsible disclosure practices and ownership policies.

<sup>3</sup> *The OeNB's Mission Statement - Oesterreichische Nationalbank (OeNB).*

<sup>4</sup> *Sustainability and ESG – Oesterreichische Nationalbank (OeNB).*

Besides, the OeNB has implemented requirements for greenhouse gas (GHG) emissions and ESG factors for selected asset classes, which are applicable to the externally managed portfolios. This approach is meant to encourage external asset managers to systematically integrate both ESG and sustainable and responsible investment (SRI) criteria into their investment practices.

In light of the experience gained so far and of best practices, the OeNB seeks to act in accordance with the Eurosystem's common stance for climate change-related sustainable investments.

Last but not least, the OeNB supports the Eurosystem's common stance on increasing awareness and understanding of ESG risks while promoting climate-related disclosures for NMPPs.

## 4 Risk management

### 4.1 Dealing with ESG risks in the non-monetary policy portfolio

In 2023, the OeNB continued integrating ESG risks into its risk management processes to adequately address their financial consequences. The value of OeNB investments may decrease if ESG risks impair the financial soundness of issuers of assets that the OeNB holds in its portfolio. Reasons for such an impairment could, for example, be an increase in natural disasters, a gradual rise in global temperatures and policy measures aimed at curbing climate change. In 2023, the OeNB used various methods to assess the impact that ESG risks could have on the value of the OeNB's investment portfolio.

The OeNB conducts comprehensive risk analyses to understand complex interactions. Based on its risk taxonomy, the OeNB captures ESG risks systematically as drivers of financial risk categories, such as market, credit and operational risks. As climate-related risks are considered to be material, the OeNB pays particular attention to such risks.

### 4.2 Conducting forward-looking self-assessments to capture risks

The non-monetary policy portfolio (NMPP) is managed under the OeNB's own responsibility, while the management of monetary policy operations and portfolios is governed by common Eurosystem guidelines. For the NMPP, the OeNB regularly conducts forward-looking self-assessments. Here, it aims to capture the financial risks and potential triggers of reputational, legal and/or liability risks.

Specifically, OeNB experts analyze in a qualitative manner multiple scenarios and transmission channels that could negatively affect the OeNB's risk profile or cause financial losses. The scenarios reflect technological advances and tightening regulatory requirements in terms of energy efficiency and carbon emissions. They also consider increases in natural disasters and biodiversity loss. Transmission channels include, for example, profitability, asset valuations and the cost of compliance. The qualitative self-assessment has a longer-term horizon that exceeds that of traditional risk models.

### 4.3 First climate stress test on the non-monetary policy portfolio

In 2023, the OeNB subjected the NMPP to a climate stress test for the first time, focusing on direct investments in government bonds. The goal was to simulate the development of important risk parameters and potential losses. Two adverse scenarios were compared with a baseline scenario to estimate the direct economic consequences for the OeNB over the next three years. The stress test was based on three scenarios developed by the Network for Greening the Financial System (NGFS): Net Zero 2050, Current Policies and Delayed Transition. The scenarios capture both physical and transition risks.



The climate stress test is a key tool for identifying and assessing climate-related risks. The OeNB will therefore continue to enhance the climate stress test, gradually integrate additional asset classes and extend the observation horizon.

#### 4.4 Expanding internal ESG risk monitoring and reporting

In 2023, the OeNB expanded its internal monitoring and reporting of ESG risks. Now it includes selected forward- and backward-looking indicators for both transition and physical risks for corporate and sovereign debtors. Physical risks result from climate-related changes and natural disasters, while transition risks arise from the transition to a carbon-neutral economy. The selected indicators regularly report, among others, on targets for greenhouse gas reduction, involvement in controversial weapons and the financial impact of physical risks. The OeNB is continually improving its internal analyses and reporting to reflect state-of-the-art practices, data and insights. Going forward, the OeNB's monitoring and reporting will also capture nature-related financial risks to a greater extent.

#### 4.5 Taking governance aspects into account

When calibrating specific limits, the OeNB systematically considers governance aspects. This helps contain the risk of the OeNB investing in debtors that do not adhere to internationally recognized rules and standards of good conduct. At the same time, reputational risks for the OeNB are mitigated.

#### 4.6 Assessing ESG risks independently based on reliable ESG data

The OeNB actively integrates ESG data into the risk management processes for its NMPP. It is committed to capturing risks in a transparent and consistent manner. In 2022, the Eurosystem agreed that climate-related reporting will be based on harmonized data. The OeNB started using data from two ESG data providers in 2022 – for drawing up analyses and compiling metrics as well as for reporting purposes. In terms of data reliability, both providers comply with high methodological requirements that also cover quality control and validation routines. Missing data are estimated via models.

It is important that ESG risks are assessed independently. This is why the OeNB's risk-monitoring unit is functionally and hierarchically separate from the risk-taking units, including the highest decision-making level.

### 5 Metrics and targets

In calculating the metrics presented below, the OeNB follows recommendations of the TCFD and the Partnership for Carbon Accounting Financials (PCAF). The reporting scope comprises investments in fixed income securities and equities including externally managed assets denominated in euro and in other currencies. Gold, real estate investment and cash are excluded. Three metrics form the basis of the Eurosystem's common minimum disclosures of NMPPs: (1) the weighted average carbon intensity (WACI), (2) total carbon emissions (3) the carbon footprint.

As a supporting metric, the OeNB reports the green bond share<sup>5</sup> of fixed income portfolios in line with the International Capital Market Association's (ICMA) Green Bond Principles.

<sup>5</sup> Indicates if the net proceeds of the fixed income instrument are used for green projects or activities that promote climate change mitigation or adaptation, or other environmental sustainability purposes.

## 5.1 Weighted average carbon intensity (WACI)

The WACI measures a portfolio's exposure to carbon-intensive issuers and is expressed in tons of CO<sub>2</sub> equivalents (tCO<sub>2</sub>e) per unit of economic activity.<sup>6</sup> Formula 1 below shows how the WACI is calculated.

$$WACI = \sum_i^n \left( \frac{\text{current value of investment}_i}{\text{current portfolio value}} \right) \times \left( \frac{\text{issuer's GHG emissions}_i}{\text{issuer's €M revenue or PPP adj GDP, population}_i} \right) \quad (1)$$

Choosing the suitable measure of economic activity depends on the type of issuer and, additionally for (sub)sovereign issuers, on the type of emission measure used in the numerator. Corporate issuers' carbon intensity is computed by normalizing their GHG scope 1 and 2 emissions by EUR million (€M) revenue (see table 4 "Scope definitions" in the annex). For (sub)sovereign issuers, a distinction is made between two types of emissions, namely production and consumption emissions, which are defined in table 1.

Production emissions are normalized by purchasing power parity (PPP)-adjusted GDP (in EUR million) while consumption emissions are normalized by population (persons). This differentiation ensures that each of the two types of emissions is scaled by a suitable indicator of economic activity. The WACI for each asset class portfolio is then calculated by weighting the issuers' carbon intensity by their respective share of holdings in the portfolio. For equities, the market value is used as holding value,

Table 1

### Types of emissions for (sub-)sovereign issuers

| Type of emissions     | Definition  |
|-----------------------|---|
| 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 the United Nations Framework Convention on Climate Change (UNFCCC) for annual national inventories. Production emissions are reported excluding and including the effects of land use, land-use change and forestry (LULUCF). <sup>1</sup> |
| 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.  |

Source: ECB.

<sup>1</sup> See UNFCCC: "The rate of build-up of carbon dioxide (CO<sub>2</sub>) in the atmosphere can be reduced by taking advantage of the fact that atmospheric CO<sub>2</sub> can accumulate as carbon in vegetation and soils in terrestrial ecosystems. Under the United Nations Framework Convention on Climate Change any process, activity or mechanism which removes a greenhouse gas (GHG) from the atmosphere is referred to as a "sink." Human activities impact terrestrial sinks, through land use, land-use change and forestry (LULUCF), consequently, the exchange of CO<sub>2</sub> (carbon cycle) between the terrestrial biosphere and the atmosphere is altered."

<sup>6</sup> A carbon dioxide equivalent (or CO<sub>2</sub> equivalent) is a metric measure used to compare the emissions from various greenhouse gases on the basis of their global warming potential by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.

whereas nominal values are used for bonds' holding values. This treatment of fixed income securities represents the best proxy available for their contribution to bond issuers' capital structures.

## 5.2 Total carbon emissions

The total carbon emissions metric represents the total absolute emissions associated with a portfolio and is expressed in tons of CO<sub>2</sub> equivalents. Formula 2 below shows how total carbon emissions are calculated.

$$\text{Total carbon emissions} = \sum_i^n \left( \frac{\text{current value of investment}_i}{\text{EVIC or PPP adj GDP}_i} \times \text{issuer's GHG emissions}_i \right) \quad (2)$$

As with the WACI, the method used for calculating total carbon emissions differs by issuer type and considers the two abovementioned types of GHG emissions for sovereigns. For corporate issuers, the GHG emissions are weighted by the investor's contribution to the issuer's enterprise value including cash (EVIC), i.e. the investor's share in the total capital structure. In contrast, the two types of (sub)sovereign carbon emissions are uniformly scaled by the PPP-adjusted GDP. The current value of investment in the numerator equals the nominal value for bonds and the market value for equities.

Each portfolio's total carbon emissions are then calculated by summing up the individual weighted emission contributions.

As an absolute measure of carbon emission, the metric's comparability across portfolios and time is limited due to the dependency on portfolio size. However, the total carbon emissions metric serves as an input in calculating the normalized carbon footprint. This additional measure overcomes the noncomparability of total carbon emissions and contributes to a more holistic picture of a portfolio's emissions.

## 5.3 Carbon footprint

The carbon footprint normalizes the total carbon emissions of a portfolio by the value of its holdings in EUR million. The metric is expressed in tons of CO<sub>2</sub> equivalents per EUR million invested, which allows comparisons across differently sized portfolios and time. As above, the holding value of an investment equals the nominal value for bonds and the market value for equities. Formula 3 below shows how the carbon footprint is calculated.

$$\text{Carbon footprint} = \frac{\sum_i^n \left( \frac{\text{current value of investment}_i}{\text{EVIC or PPP adj GDP}_i} \right) \times \text{issuer's GHG emissions}_i}{\text{current portfolio value (€M)}} \quad (3)$$

#### 5.4 Metrics for the OeNB's NMPPs in 2022 and 2023

The metrics shown below cover the euro-denominated and non-euro-denominated NMPPs. Chart 1 shows how the volume and asset allocation of the OeNB's NMPPs changed from 2022 to 2023. The portfolio value increased from EUR 24.6 billion (2022) to EUR 25.8 billion (2023). The share of investments in sovereign bonds decreased from 64% (2022) to around 61% (2023), whereas the shares in corporate bonds and in equities increased slightly. At about 13% (2022) and 14% (2023), equities were the second-largest asset class, followed by corporate bonds, whose share increased from 11% in 2022 to 13% in 2023.

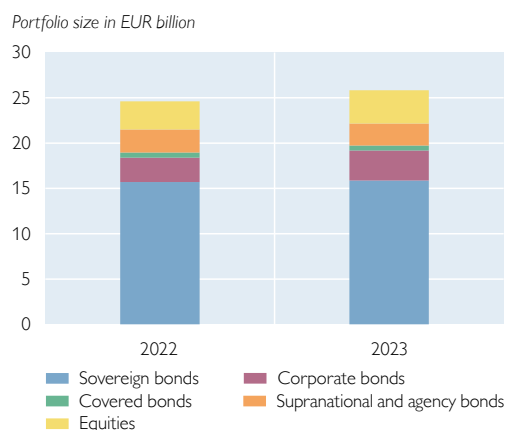
Tables 2 and 3 present the abovementioned climate-related metrics – the WACI, total carbon emissions and the carbon footprint – for 2023 (table 2) and 2022 (table 3). Each metric is broken down by asset class. The data basis for both tables is as follows: holdings as at year-end, GHG emissions for sovereigns (2021) as well as for corporates and supranationals (both 2022). Both the financial and public sector data used for calculating the metrics date from 2022. Data availability across asset classes is close to 100%, except for supranational and agency bonds, where coverage is at least around 60%.

Compared to 2022, the carbon metrics for sovereign assets significantly decreased from 2022 to 2023 due to a reallocation from USD to EUR. For example, the total carbon emissions (production emissions excluding LULUCF) fell by 494,000 tCO<sub>2</sub>e and the carbon footprint decreased by 16.4%. Additionally, the green bond share increased from 2.3% to 5.8%.

For non-sovereign assets, the carbon metrics increased slightly in 2023, driven by the higher share of corporate bonds and equities, which tend to have higher GHG emissions. Total carbon emissions increased by around 88,000 tCO<sub>2</sub>e from 2022 to 2023. Furthermore, the WACI and the carbon footprint, both of which account for portfolio size, likewise increased on the total non-sovereign asset level, namely by 4.5% and 13.7%, respectively. For corporate bonds, the WACI and the carbon footprint decreased by approximately 7.5% and 13.2%, mainly driven by a shift from US dollar- to euro-denominated positions. The green bond share increased from 6.0% to 9.4%.

Chart 1

#### The OeNB's NMPPs in 2022 and 2023



Source: OeNB.

Table 2

### Climate-related TCFD metrics for the OeNB's NMPPs as at year-end 2023

|  | Sovereign                         |                     |                     | Non-sovereign    |                                 |                  |               |                   |
|--|-----------------------------------|---------------------|---------------------|------------------|---------------------------------|------------------|---------------|-------------------|
|  | Sovereign and sub-sovereign bonds |                     |                     | Total            | Supra-national and agency bonds | Corporate bonds  | Covered bonds | Equities          |
|  | Production                        |                     | Consumption         |                  |                                 |                  |               |                   |
|  | Excl. LULUCF                      | Incl. LULUCF        |                     |                  |                                 |                  |               |                   |
| <b>Portfolio size</b> (EUR billion)  | 15.9                              |                     |                     | 10.0             | 2.4                             | 3.3              | 0.6           | 3.7               |
| <b>WACI</b><br>(tCO <sub>2</sub> e per EUR million revenue, GDP, consumption expenditure, or per capita) | 169<br>(100%)                     | 160<br>(100%)       | 11<br>(100%)        | 74<br>(96%)      | 1.4<br>(93%)                    | 124<br>(93%)     | 0.8<br>(99%)  | 86<br>(100%)      |
| <b>Total carbon emissions</b><br>(tCO <sub>2</sub> e)  | 2,680,421<br>(100%)               | 2,544,286<br>(100%) | 2,927,473<br>(100%) | 659,547<br>(87%) | 73<br>(58%)                     | 452,511<br>(92%) | 90<br>(96%)   | 206,874<br>(100%) |
| <b>Carbon footprint</b><br>(tCO <sub>2</sub> e per EUR million invested)                                 | 169<br>(100%)                     | 160<br>(100%)       | 185<br>(100%)       | 76<br>(87%)      | 0.1<br>(58%)                    | 148<br>(92%)     | 0.2<br>(96%)  | 56<br>(100%)      |
| <b>Green bond share</b><br>(% of fixed income portfolios based on ICMA's Green Bond Principles)          | 5.8%                              |                     |                     | 9.4%             | 7.7%                            | 11.0%            | 7.6%          | -                 |

Source: ISS ESG, Carbon 4 Finance, World Bank, OeNB calculations.

Note: The percentages given in parentheses below each figure indicate data availability, calculated as the percentage of investments (i.e. holding value of investments / holding value of portfolio) for which all required data (i.e. both emissions and financial data) are available. The "Total" column sums up all non-sovereign assets.

Table 3

### Climate-related TCFD metrics for the OeNB's NMPPs as at year-end 2022

|  | Sovereign                         |                     |                     | Non-sovereign    |                                 |                  |               |                   |
|--|-----------------------------------|---------------------|---------------------|------------------|---------------------------------|------------------|---------------|-------------------|
|  | Sovereign and sub-sovereign bonds |                     |                     | Total            | Supra-national and agency bonds | Corporate bonds  | Covered bonds | Equities          |
|  | Production                        |                     | Consumption         |                  |                                 |                  |               |                   |
|  | Excl. LULUCF                      | Incl. LULUCF        |                     |                  |                                 |                  |               |                   |
| <b>Portfolio size</b> (EUR billion)  | 15.7                              |                     |                     | 8.9              | 2.5                             | 2.7              | 0.6           | 3.1               |
| <b>WACI</b><br>(tCO <sub>2</sub> e per EUR million revenue, GDP, consumption expenditure, or per capita) | 202<br>(100%)                     | 187<br>(100%)       | 13<br>(100%)        | 70<br>(96%)      | 1.5<br>(95%)                    | 134<br>(93%)     | 0.8<br>(99%)  | 86<br>(100%)      |
| <b>Total carbon emissions</b><br>(tCO <sub>2</sub> e)  | 3,174,522<br>(100%)               | 2,936,622<br>(100%) | 3,682,125<br>(100%) | 571,678<br>(96%) | 1,047<br>(95%)                  | 419,362<br>(92%) | 66<br>(96%)   | 151,203<br>(100%) |
| <b>Carbon footprint</b><br>(tCO <sub>2</sub> e per EUR million invested)                                 | 202<br>(100%)                     | 187<br>(100%)       | 234<br>(100%)       | 67<br>(96%)      | 0.4<br>(95%)                    | 171<br>(92%)     | 0.1<br>(96%)  | 49<br>(100%)      |
| <b>Green bond share</b><br>(% of fixed income portfolios based on ICMA's Green Bond Principles)          | 2.3%                              |                     |                     | 6.0%             | 3.6%                            | 8.1%             | 7.4%          | -                 |

Source: ISS ESG, Carbon 4 Finance, World Bank, OeNB calculations.

Note: The percentages given in parentheses below each figure indicate data availability, calculated as the percentage of investments (i.e. holding value of investments / holding value of portfolio) for which all required data (i.e. both emissions and financial data) are available. The "Total" column sums up all non-sovereign assets.

## 6 The OeNB's target

Going forward, the OeNB aims to align its NMPPs with the EU's long-term decarbonization objective in support of the Paris Agreement. The EU's objectives are laid down in its 2050 long-term strategy, according to which the EU aims to be climate neutral by 2050 in line with the Paris Agreement objective to keep the global temperature increase to well below 2°C and pursue efforts to keep it to 1.5°C.

### Annex

Table A1

#### GHG emissions

| Type    | Definition   |
|---------|--|
| Scope 1 | Direct GHG emissions that occur from sources owned or controlled by the reporting company, i.e. emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.   |
| Scope 2 | Indirect GHG emissions from the generation of purchased or acquired electricity, steam, heating, or cooling consumed by the reporting company. Scope 2 emissions physically occur at the facility where the electricity, steam, heating, or cooling is generated.  |
| Scope 3 | All other indirect GHG emissions (not included in Scope 2) that occur in the value chain of the reporting company. Scope 3 can be broken down into upstream emissions and downstream emissions. Upstream emissions include all emissions that occur in the life cycle of a material/product/service up to the point of sale by the producer, such as from the production or extraction of purchased materials. Downstream emissions include all emissions that occur as a consequence of the distribution, storage, use, and end-of-life treatment of the organization's products or services. |

Source: PCAF.

Table A2

## Disclosure Framework

### Allocation

| Issuer Type                    | Factor                  | Definition   | Unit               |
|--------------------------------|-------------------------|--|--------------------|
| Corporate bonds                | Scope 1 and 2 emissions | Scope 1 comprises direct carbon emissions that occur from sources that are controlled or owned by an organization (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.   | tCO <sub>2</sub> e |
| Supranational and agency bonds |                         |  |                    |
| Sovereign bonds                | 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 the United Nations Framework Convention on Climate Change (UNFCCC) for annual national inventories. Production emissions are reported excluding and including the effects of land use, land-use change and forestry (LULUCF). |                    |
|                                | Consumption emissions   | Emission 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.  |                    |

### Normalization

| Issuer Type                    | Factor                       | Definition   | Unit        |
|--------------------------------|------------------------------|--|-------------|
| Corporate bonds                | 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.  | EUR million |
| Supranational and agency bonds |                              |  |             |
| Sovereign bonds                | Production: PPP-adjusted 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 level. | EUR million |
|                                | Consumption: Population      | Total population of a country.   | Persons     |

### Attribution

| Issuer Type                    | Factor           | Definition   | Unit        |
|--------------------------------|------------------|--|-------------|
| Sovereign bonds                | PPP-adjusted 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 level. | EUR million |
| Equities                       | EVIC             | The sum of the market capitalization of ordinary shares at fiscal year-end, the market capitalization of preferred shares at fiscal year-end, and the book values of total debt and minority interests.  | EUR million |
| Supranational and agency bonds |                  |  |             |
| Corporate bonds                |                  |  |             |
| Covered bonds                  |                  |  |             |

Source: ECB.