BANQUE CENTRALE DU LUXEMBOURG
EUROSYSTÈME

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

2025

Contents

1. Introduction

Climate change-related extreme weather events and the transition towards a low-carbon economy may affect the valuation of financial assets. Consequently, identifying an undesirable accumulation of climate change-related risks is acknowledged as a key element of the management of the BCL's own non-monetary policy portfolios (NMPPs).

The BCL's climate-related financial disclosures[1] of its NMPPs, which comprise the bank's own funds investments and the staff pension fund, reflect the BCL's commitment to transparency on its investments' exposure to climate-related risks and environmental footprint.

In 2020, the BCL started monitoring the induced Greenhouse Gas (GHG) emissions of its own investments. Since 2023, the BCL publishes its climate disclosures report on an annual basis, in accordance with the applicable common Eurosystem minimum disclosure principles and methodologies. The Eurosystem disclosures are based on the Task Force on Climate-related Financial Disclosures (TCFD) recommendations and the Partnership for Carbon Accounting Financials (PCAF) methodologies, while aiming to align more closely with the EU Corporate Sustainability Reporting Directive (CSRD). The BCL has also taken the guidance provided to central banks by the Network for Greening the Financial System (NGFS) into due consideration and the classification of its investments abides by the International Capital Markets Association's (ICMA) thematic bond principles.

The approaches and methodologies described in this report are based on the current best practices for greening central banks' NMPPs and the data available at the moment of the report. They are subject to further analysis and evolve over time with new developments in the field of climate risk and sustainability. The BCL expects data availability and quality to improve over time, while metrics are also subject to methodological changes in accordance with the common Eurosystem stance. This year, the BCL has broadened the scope of this report by including scope 3 emissions.

The results for the reporting year 2024 demonstrate that the BCL has made significant progress in its decarbonization efforts. This is evident in the gradual decarbonization of the bank's NMPP holdings across sovereign and non-sovereign asset categories.

[1] Climate-related financial disclosures are from here on simply referred to as "disclosures" to improve readability.

Table 1: Summary of the BCL's main sustainable investment achievements

Framework enhancement by applying Paris-aligned Benchmark exclusion criteria across all corporate investments.
Replacement of equity exposures through ETFs from Transition to Paris-aligned Benchmarks
Reduction of the carbon footprint of corporate bond holdings from 2020 to 2024 by 81% overall.
Reduction of the carbon footprint of equity investments from 2020 to 2024 by 91% overall.

2. Governance

2.1 Overall Governance and organisational structure

The BCL's main task is to participate in the execution of the tasks of the European System of Central Banks (ESCB) / Eurosystem with a view to achieving its objectives.

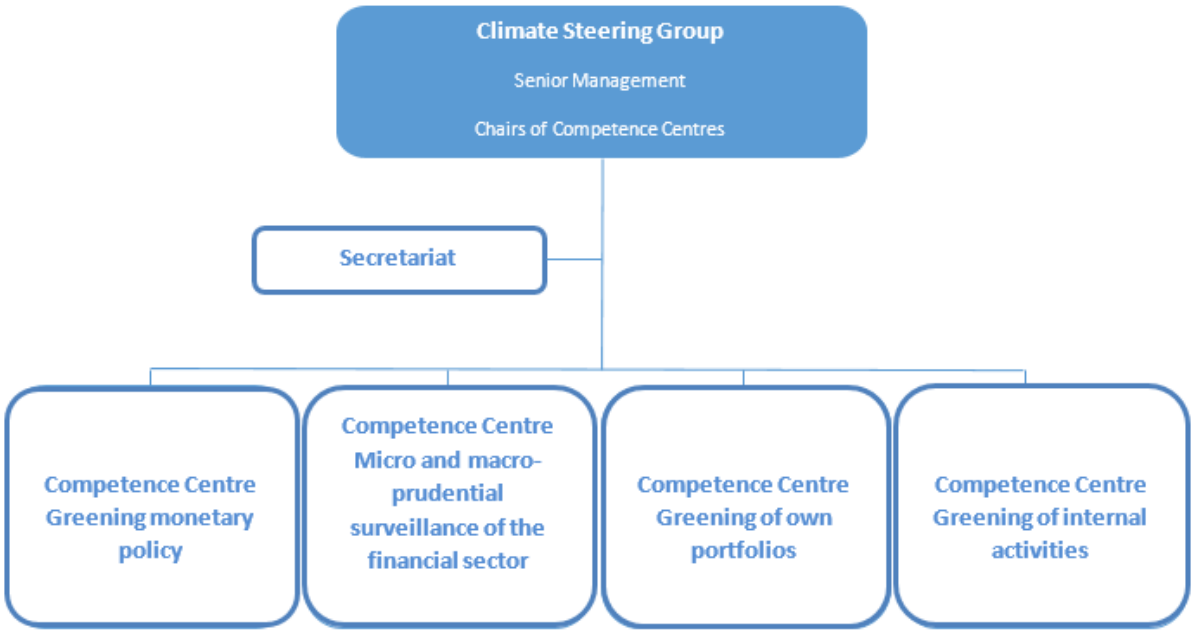
The primary objective of the ESCB / Eurosystem is to maintain price stability. Without prejudice to the objective of price stability, it shall support the general economic policies in the European Union ("Union") with a view to contributing to the achievement of the objectives of the Union as laid down in Article 3 of the Treaty on European Union.

Climate considerations and related risks are of relevance to the Eurosystem mandate, as reflected in the European Central Bank (ECB) Strategy Review and the climate-related action plan, as endorsed by the ECB Governing Council on 8 July 2021, with the primary objective to maintain price stability taking precedence.

Within the limits of Article 127(5) of the Treaty on the Functioning of the European Union and Article 2(6) of its Organic Law, the BCL shall also contribute to the smooth conduct of policies pursued by the competent authorities relating to the prudential supervision of credit institutions and the stability of the financial system.

To ensure effective coordination across the bank on climate-related topics, the BCL set up, in its organisation, a Climate Steering Group (CSG) in January 2022. The CSG involves BCL senior management as well as the president and secretary of each Competence Centre reporting to the CSG (see Chart 1). The CSG provides strategic guidance and centralises the work from the four Competence Centres on (1) Greening Monetary Policy, (2) Micro and Macro-prudential Surveillance of the Financial Sector, (3) Greening of own Portfolios, and (4) Greening of Internal Activities. The aim of this structure is to provide input to the BCL's decision making bodies and coordinate "climate action" in the various fields of the competence centres.

Chart 1: Climate Steering Group



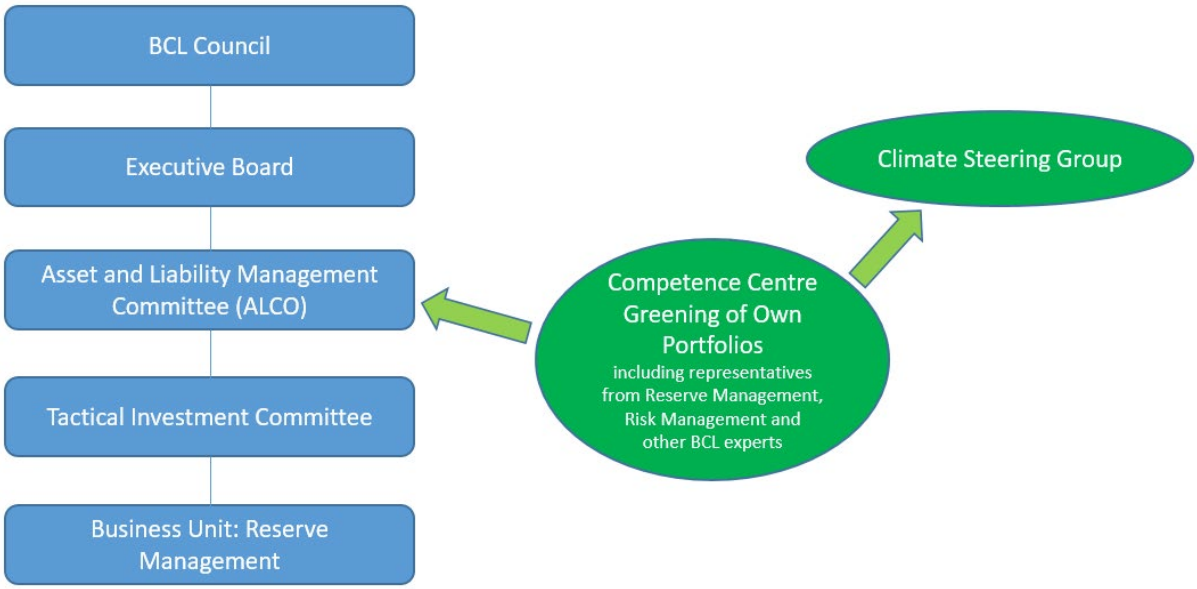
2.2 Governance related to non-monetary policy portfolios

Investments in the NMPPs of Eurosystem National Central Banks (NCB) and the ECB are managed under the responsibility of each NCB and the ECB. The BCL's approach regarding its own investment policies for NMPPs is also guided by the common Eurosystem stance for identifying and monitoring climate-related risks in these portfolios.

In the area of NMPPs, the BCL has adopted an integrated approach for the governance of climate-related risks and opportunities, according to which climate change-related considerations are addressed within its existing governance structures.

Governance of the NMPPs is based primarily on the BCL's asset management framework, which encourages an integrated investment process that supports and is fully aligned with the strategic goals of the central bank. The decision-making process related to the financial asset management of the BCL´s NMPPs is based on a multiple level structure (see Chart 2). All levels take decisions, within the limits of their responsibilities, on the basis of adequate information and regular reporting.

Chart 2: BCL's Investment governance of NMPPs, integrating sustainability considerations



With regard to the management of the NMPPs, the Council approves the investment policy guidelines, which establish and prioritise general investment principles and outline the approach to implement these principles. The Council also approves the general set-up of portfolios and management guidelines related to the BCL's NMPPs.

The Executive Board defines the general risk management framework for the NMPPs in accordance with the investment policy guidelines. In this respect, it approves the investment limits framework for the management of the NMPPs on an annual basis, which is prepared by the Asset and Liability Management Committee (ALCO).

The ALCO is a strategic investment committee that monitors the balance sheet of the BCL in relation to its investment capacities and examines potential investment opportunities related to the NMPPs and their risk profile (market, credit and liquidity risks, including climate-related risks). The ALCO defines the strategic asset allocation based on the investment universe available and the general risk management framework defined by the Executive Board. In addition, the committee sets strategic benchmarks that reflect the asset allocation. The ALCO receives input from the CSG Competence Centre responsible for the greening of own portfolios.

The Tactical Investment Committee is responsible for contributing to the management of the financial assets at a tactical level. The committee regularly monitors the evolution of the portfolios on a short-term basis and may propose deviations to the strategic asset allocation of the relevant portfolios by defining valid tactical benchmarks.

The Reserve Management unit is responsible for the implementation of the investment decisions while the Financial Risk Management is responsible for controlling the risks involved.

The Competence Centre for the greening of own portfolios provides experts input directly to the ALCO and reports to the CSG, ensuring a holistic integration of the responsible investment considerations into the bank's existing institutional structure for managing its NMPPs. This Competence Centre permanently includes representatives from Reserve Management and Risk Management and meets on a regular basis. The Competence Centre is in charge of reviewing the environmental, social and governance (ESG) characteristics of the BCL's portfolios and considering potential updates to the metrics and methodologies applied. Moreover, it also follows up on the Eurosystem stance regarding climate considerations in NMPPs and liaises with the ESG data providers in order to discuss improvements in data availability and quality. The Competence Centre prepares proposals to the ALCO for enhancing the investment process by incorporating sustainable and responsible investment considerations into the bank's strategic asset allocation for NMPPs. Final approval of the proposals resides with the Executive Board.

3. Strategy

3.1 The BCL's role in European and international fora on climate change

Climate change poses a significant global challenge that calls for a coordinated international response. The BCL has consistently supported European and global initiatives aimed at advancing the understanding and integration of climate and nature-related risks. Since September 2018, it has been a member of the Network of Central Banks and Supervisors for Greening the Financial System (NGFS). This coalition, composed of central banks and financial supervisors, seeks to enhance collective efforts in promoting a greener financial system. The NGFS achieves this by conducting analytical research and establishing common reference frameworks for its members. The Network regularly publishes reports and organises events to disseminate its findings and foster dialogue on climate-related financial risks.

The analytical work of the NGFS is currently done in four workstreams, two task forces as well as three expert networks. The BCL participates in the workstreams on Supervision, Monetary Policy, Scenario Design and Analysis, and Net Zero for Central Banks, as well as in the Task Force on Capacity Building and Training, and in the two Expert Networks on Legal Issues and Research. Through its involvement, the BCL seeks to advance the collective knowledge and capacity of central banks and financial supervisors in addressing climate-related financial risks, while ensuring that the latest research and best practices are shared across the global financial system.

The BIS Innovation Hub (BISIH) launched its Innovation Network on 19 January 2021 to support BISIH priorities, share knowledge about technology projects and discuss innovative answers to problems relevant to central banks. The Innovation Network currently features six working groups, mirroring the BISIH's thematic priorities: Suptech and Regtech, Next-generation financial market infrastructures, Central bank digital currencies, Open finance, Cyber security, and Green finance. The BCL participates in the working group on Green finance, contributing to the identification and

development of novel technological solutions aimed at addressing existing challenges within the field of sustainable finance.

Since the ECB initiated its climate action plan in 2021, the BCL, as a member of the Eurosystem, has actively participated in these preparatory works and action plan. The BCL is a member of the Eurosystem Climate Change Forum - a voluntary network promoting effective ways of collaboration within the Eurosystem on climate change-related knowledge and fostering cooperation in research and analysis as well as capacity building.

In January 2024, the ECB published its updated Climate and Nature Plan for 2024–2025, which builds upon the previous action plan of 2021 and expands the scope to include nature-related risks. The updated plan aims to assess green investment needs, analyse transition risks, and advance macroeconomic modelling to incorporate climate aspects. It also focuses on integrating climate change impacts into climate scenarios, improving data availability for physical risk analysis, and exploring the economic and financial implications of biodiversity loss and the degradation of nature.

3.2 Strategy for non-monetary policy portfolios

The main objectives of the investment policy are to generate a stable income and to ensure, over the long term, a return that takes into account capital preservation and liquidity considerations. Sustainability aspects are integrated in three main blocks.

i. Climate - Carbon Footprint

Climate change is relevant to the management of the BCL's NMPPs as the physical effects of climate change and the transition to a net-zero economy may create financial risks with adverse economic consequences, which could affect the safety of the bank's own funds' investments.

The BCL follows an integrated approach, monitoring climate risks as part of the overall risk management process, whereby climate risks do not form a new risk category but are assessed as an amplifying factor of existing categories such as credit, market and liquidity risk. As such, environmental sustainability aspects are embedded within the existing investment objectives.

The BCL aims to mitigate climate-related risks by gradually aligning its own investments with the EU's long-term climate neutrality objective in support of the Paris Agreement. Reducing the GHG emissions associated with its NMPPs is the main focus of the BCL's strategy. GHG emissions in tons per million EUR invested is used as reference indicator as it allows for comparisons of portfolios with different sizes over time.

ii. ESG - Impact Investing

Beyond its support for the fight against climate change, the bank has been increasingly incorporating ESG criteria in its own investment process. The BCL's strategy for sustainable investment involves increasing its holdings in so-called green bonds or other sustainable and socially responsible debt instruments. Investing in green bonds may contribute to lower physical and transition risks by supporting issuers on their trajectory aiming at a more sustainable environment.

iii. ESG - Negative Screening

Since the beginning of 2024, the BCL applies a negative screening strategy for a set of pre-defined exclusion criteria, applicable across all non-monetary-policy-related corporate bond and equity investments[2]. The introduced exclusion criteria are inspired by the minimum standards for EU Paris-aligned Benchmarks.[3] In accordance with these benchmarks, investments (either in the form of bonds or equities) exclude companies found to be involved in any activities related to controversial weapons, in the cultivation or production of tobacco, as well as violators of the United Nations Global Compact principles or the Organisation for Economic Cooperation and Development Guidelines for Multilateral Enterprises. In addition to the aforementioned criteria, investments in corporates also exclude fossil fuel companies in the coal, oil, and gas industries, thereby further supporting the pre-defined decarbonisation strategy.

4. Risk Management of non-monetary policy portfolios

The BCL's NMPPs are exposed to climate risks, which might lead to adverse outcomes in the event of a gradual change in risk factors or a climate shock. Transition risks and physical risks are distinguished. Transition risks concern the likelihood and impact of negative 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 bank actively identifies, assesses and manages the exposure of its NMPPs to climate-related risks. Climate risks are integrated into the risk management process in a bottom-up approach where they are assessed as an amplifying factor of existing financial risk categories.

The BCL aims to integrate climate-change related risks of its NMPPs across the entire risk management cycle, ensuring a prudent and quantifiable risk measurement. In order to develop a thorough understanding of the potential impact of climate change on its NMPPs, the exposure to climate risk is monitored using specific metrics such as emissions data. According to both qualitative and quantitative assessments, the climate-related risks to which the NMPPs are exposed to are currently considered to have a minor short-term impact on existing financial risks.

5. Metrics and Targets

High levels of data availability and quality are essential for calculating reliable and relevant climate metrics. The independent climate data providers Institutional Shareholder Services (ISS) and Carbon4 Finance supply the Eurosystem central banks with climate data. The Eurosystem promotes transparent disclosures aimed at providing the most relevant and accurate information available. To this end, the Eurosystem regularly discusses improvements in data availability and quality with

[2] To implement these exclusions, the BCL relies on the data provided by MSCI.
[3] Commission Delegated Regulation (EU) 2020/1818 of 17 July 2020 – Article 12 (1)

policymakers and its climate data providers. Therefore, the BCL expects data availability and quality to improve over time, while metrics are subject to methodological changes in accordance with the common Eurosystem stance.

The BCL reports and analyses metrics for supranational, agency and corporate issuers based on issuers' scope 1, 2, and 3 emissions. The underlying issuer emissions are partly self-reported by issuers and partly modelled by the data providers. In line with best practices, the BCL publishes the scope 3 emissions data for the first time in 2024. However, scope 3 emissions data remain subject to quality issues that limit their reliability and comparability over time, including i) considerable estimation uncertainty, ii) diverging estimates across different data providers, and iii) methodological refinements. In light of these data shortcomings, scope 3 emissions for BCL's NMPPs are presented separately from scope 1 and 2 emission metrics.

Table 2: Definitions of GHG emissions types

Issuer type	Emissions	Definition
Corporate	Scope 1 & 2 & 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 all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.
Supra & Agency		
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 incl. LULUCF	Production emissions, as defined above, adjusted for the impact of human activities on carbon sinks through Land Use, Land-Use Change and Forestry (LULUCF).
	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.

5.1 Metrics

In 2020, the BCL started monitoring the induced GHG emissions of its own investments. The emissions data consider the total amount of GHG emissions released into the atmosphere as a result of the activities of a particular organisation, community or individual and are measured in carbon dioxide equivalents (CO_2e).[4] In the context of the common stance for climate change-related sustainable investments in NMPPs, three metrics are considered.

i. The *Weighted Average Carbon Intensity (WACI)* measures a portfolio's exposure to issuers' carbon intensity. The emissions of each issuer are normalized with a measure of economic activity and then weighed by their respective share of holdings in the investment portfolio. The TCFD endorsed this metric in its final recommendations report. Since issuers with higher carbon intensity are likely to be more exposed to carbon related market and regulatory risks, this metric delivers an "outside-in-perspective" (i.e. financial materiality) serving as proxy for a portfolio's exposure to climate transition risk. Data normalization allows for broad comparability relative to other portfolios and benchmarks.

ii. The *Total Carbon Emissions* measure the absolute emissions associated with a portfolio, expressed in tons of CO_2e. Issuer emissions are allocated to investors based on an ownership approach weighting the investor's contribution to the issuer's total capital structure (e.g. equity, debt, etc.). This metric delivers an "inside-out-perspective" (i.e. environmental materiality) and serves as proxy for a portfolio's environmental impact. The metric is widely applied across the financial industry. On the downside, the metrics' cross-portfolio and cross-time comparability is limited due to the absence of normalization for portfolio size.

iii. The *Carbon Footprint* measures the total emissions, as described above, normalized by the portfolio value. Comparability is ensured by dividing by the portfolio's size and expressing the carbon footprint in tons of CO_2e per EUR million invested.

The various asset classes require different treatment in terms of emissions attribution and normalization.

The emissions of corporates, supranational and agencies are attributed to the securities based on the issuers' enterprise value including cash (EVIC) for the total carbon emissions and carbon footprint, while they are normalized by revenue for the WACI calculation.

Sovereign issuers' emissions are attributed to the government bonds using Purchasing Power Parity (PPP) adjusted Gross Domestic Product (GDP) to evaluate the total carbon emissions and the carbon footprint. To compute the WACI, production and consumption emissions are normalized by PPP adjusted GDP and population respectively. The formulas for the three metrics and further information

[4] Carbon dioxide equivalent (or CO_2e) 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.

on the applied emissions allocation methods, normalisation and attribution factors are provided in the appendix.

Sovereign issuers' production emissions are reported both including and excluding the effects of Land Use, Land-Use Change and Forestry (LULUCF). Plants and soil can serve as a carbon sink by absorbing more carbon from the atmosphere than they emit. Since GHG emissions cannot be entirely eliminated, such carbon removals are essential to reach climate neutrality.

For the interpretation of the trends observed, it is important to consider the following aspects related to the underlying data.

Whenever possible, the metrics are calculated using holdings, emissions and financial data for the same reference year. Due to the unavailability of climate data for the more recent cut-off dates, there is a time lag between the portfolio holdings and the underlying data. The respective climate metrics are hence restated in subsequent disclosure reports as the revised data become available, in line with the common Eurosystem methodology. As such, the metrics for 2023 were recalculated with economic, financial and emissions data shifting one year forward across all asset types compared to the figures published last year. The sovereign bond metrics will be recalculated again next year based on updated GHG emissions, while all other asset types are now at their final values for 2023. Among the 2022 figures, only the sovereign bonds' metrics needed to be updated to consider 2022 GHG emissions instead of those from 2021. Although this approach may add to the complexity for the interpretation of the trends observed, it is an essential step to ensure high quality time series of data after several disclosure rounds.

Metrics need to be based either on reported emissions (by the company itself) or, when reporting is not available or incomplete, on estimated emissions. The tables presented in the following chapters show the percentage of investments in each portfolio for which these data were available.

The variation in climate metrics over time are influenced by several macroeconomic, company-specific and BCL portfolio specific factors, but also the increasing availability of data.

Any change in the relative contribution of each asset class will influence the portfolio metrics. Hence, from a climate risk management perspective, it is of utmost importance to monitor climate metrics evolution for each asset class.

The GHG metrics based on scope 1 and 2 emissions are presented in chapters 5.1.1 and 5.1.2. In line with the common Eurosystem methodology, the measures on scope 3 emissions are displayed separately from the scope 1 & 2 values in chapter 5.1.3.

Additional climate metrics such as the share of green, social and sustainable bonds complete the overview provided by the GHG metrics. These specific bonds comply with the 2021 Green Bond Principles, the 2021 Social Bond Principles and the 2021 Sustainability Bond Guidelines published by the International Capital Market Association. The assessment made by external data providers is performed at issue level, based on the use of proceeds, and does not provide an appreciation of the

sustainability of the issuer. Sustainable bonds have a combination of green and social activities as eligible projects.

GHG metrics as well as the proportion of green, sustainable and social bonds are reported regularly to the bank's investment committees to inform about the progress on the key elements of the portfolios' sustainable investment strategies. In collaboration with other Eurosystem central banks and external data providers, the BCL strives to further improve coverage, address data quality concerns and continues its research in this domain. The idea is to gradually expand the responsible investment strategies pursued in the NMPPs with respect to portfolio specific objectives and constraints, thereby adopting a more granular approach to identifying sustainability-related risks and opportunities.

5.1.1 EUR-denominated NMPPs

The table below presents the WACI, the total carbon emissions and the carbon footprint of the BCL's euro denominated NMPPs, including the assets related to BCL's legal pension liabilities (1st pillar of the Luxembourgish pension system), as of 31 December 2024, comprising a mix of sovereign, supranational, agency and corporate bonds, as well as equity holdings. Historical figures since 2020 are available in the appendix.

Table 3: Climate-related metrics of the BCL's EUR-denominated NMPPs for year-end 2024

	Sovereign			Non-sovereign				
	Sovereign and sub-sovereign bonds			Total	Supranational & agency bonds	Corporate bonds	Covered bonds	Equities
Euro-denominated NMPPs	Production	Production incl. LULUCF	Consumption					
Portfolio size (€ mn)	1 087			3 717	2 963	378	225	152
Weighted average carbon intensity (tCO2e / € mn revenue, GDP, or per capita)	134 (99%)	129 (99%)	13 (99%)	3 (82%)	<1 (79%)	14 (82%)	<1 (81%)	29 (100%)
Total carbon emissions (tCO2e)	146 718 (99%)	140 992 (99%)	189 469 (99%)	3 941 (80%)	185 (78%)	3 000 (82%)	16 (81%)	740 (100%)
Carbon footprint (tCO2e / € mn invested)	134 (99%)	129 (99%)	173 (99%)	1 (80%)	<1 (78%)	10 (82%)	<1 (81%)	5 (100%)
Green Bonds Share	3%			22%	22%	25%	13%	N/A
Sustainable Bonds Share	0%			17%	20%	0%	0%	N/A
Social Bonds Share	0%			6%	5%	9%	28%	N/A

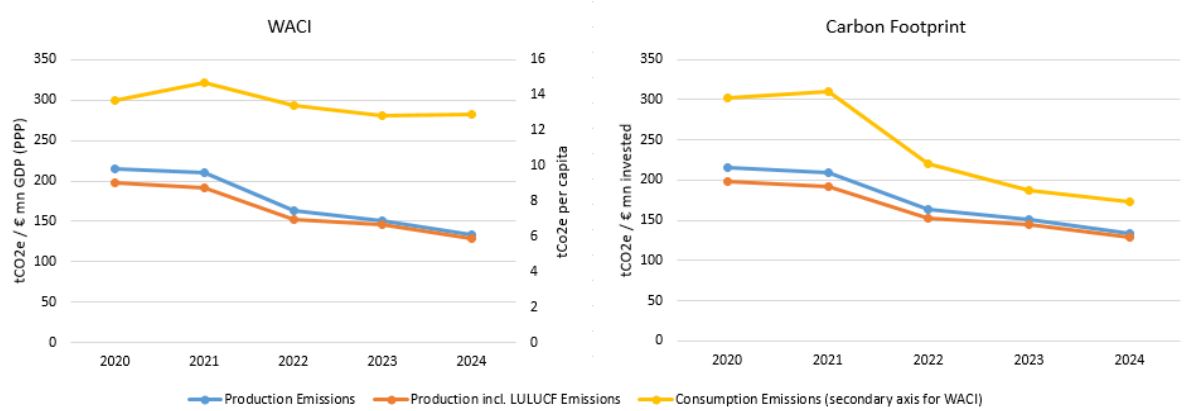
Sources: Institutional Shareholder Services, Carbon4 Finance, Bloomberg, World Bank, BCL calculations

Note: The percentages in the brackets below the metrics represent data availability, calculated as the percentage of investments for which all required data (i.e. emissions data and financial data) is available. The Portfolio size evaluates the investments in line with the accounting rules used in the official annual accounts, whereas the calculations of WACI, total carbon emissions and carbon footprint are based on the nominal value for bonds and on market value for equities. The green, social and sustainable bond shares are also based on nominal amounts.

In 2024, the invested amounts increased substantially from their 2023 levels, which led, logically, to higher carbon emissions in absolute terms for sovereign, supranational and agency bonds. Relative GHG measures, such as the WACI and the carbon footprint, that are independent of portfolio size, improved compared to 2023 for almost all categories as increased investments in low-emitting issuers overcompensated exposures to issuers with higher emissions.

The carbon footprint of sovereign bond holdings in EUR-denominated NMPPs was ca. 3% lower at year-end 2024 than at year-end 2023 using both production and consumption emissions, continuing the decreasing trend observed since 2020. Considering the effects of LULUCF did not change the results materially. The WACI calculated with production emissions shows the same evolution as the carbon footprint because both metrics use PPP-adjusted GDP in the denominator. They are therefore equivalent. The WACI based on consumption emissions per capita remained unchanged in 2024 compared to the previous year.

Chart 3: Sovereign Bonds' WACI and Carbon Footprint Evolution of the BCL's EUR-NMPPs



The WACI and carbon footprint of the supranational and government-related agency bonds remained at low levels. The service-oriented character of the activities of many supranational entities, agencies and development banks results in very low levels of scope 1 and 2 emissions. The majority of emissions associated with these issuers are categorised as scope 3 emissions.

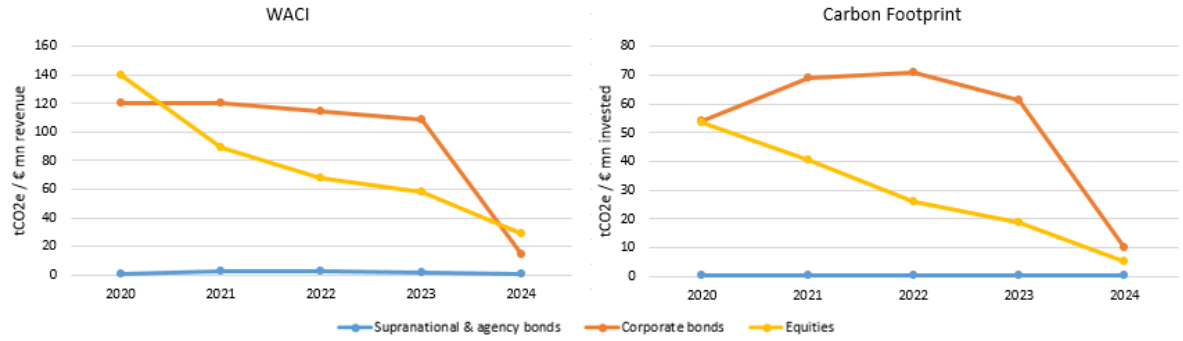
The exposure to private-sector corporate bonds also increased significantly in 2024 by ca. € 214 mn. Considering scope 1 & 2 emissions, the WACI dropped substantially from 86 to only 14 tCO2e / € mn revenue and the carbon footprint fell from 51 to 10 tCO2e / € mn invested, as the majority of the new acquisitions were bonds of corporates with low levels of scope 1 & 2 emissions.

In line with the common Eurosystem approach, the BCL's GHG metrics relative to the covered bonds are based on the GHG emissions associated with the issuer instead of the cover pool. Consequently, there is no difference in GHG metrics between a secured and an unsecured bond from the same issuer.

The equity allocation consists of investments in Exchange Traded Funds (ETFs). In 2024, in line with its decarbonisation investment strategy, the BCL switched from ETFs tracking Climate Transition benchmarks to Paris-aligned products[5], which led to further decarbonisation of the BCL's equity exposure across all metrics. The WACI declined from 63 to 29 tCO2e / € mn revenue and the carbon footprint stands at less than a third of the previous year's value. As defined in the EU Benchmarks Regulation, Paris-aligned benchmarks follow a pre-defined decarbonisation path and apply a combination of norms-based and activity-based exclusions related to coal, oil and gas.

[5] Based on MSCI Inc. (MSCI) assessment.

Chart 4: Non-Sovereign Bonds' WACI and Carbon Footprint Evolution of the BCL's EUR-NMPPs



5.1.2 NMPPs denominated in Foreign Currencies (FX)

In 2024, the assets allocated to foreign currency denominated assets fell from 195 mn to 9 mn, while EUR-denominated investments were expanded significantly. The FX NMPPs are exclusively invested in green bonds, issued by supranational and government-related agencies. The associated carbon footprint was less than 1 tCO2e / € million invested at year-end 2024 and the WACI stood at 2 tCO2e / € million revenue.

5.1.3 Scope 3 Emissions

The GHG Protocol[6] defines scope 3 emissions as all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions. Scope 3 typically represents the largest emissions category for the majority of companies. However, corporate disclosure of scope 3 emissions has proven to be significantly less prevalent when compared to the disclosure of scope 1 and 2 emissions, as data from corporate value chains are less available and not directly controlled by the company. The scope 3 data for supranational issuers and agencies is almost entirely based on modelled emissions by ISS. On the corporate side, more self-reported data is already available and coverage is expected to increase in the near future in response to regulatory disclosure requirements.

Bearing in mind these current data shortcomings, the end-2024 figures in the below tables serve as the starting point for future evaluation on the scope 3 emissions evolution in the BCL NMPPs.

[6] https://ghgprotocol.org/

Table 4: Scope 3 emissions for EUR-denominated NMPPs

Euro-denominated NMPPs	Non-sovereign				
	Total	Supranational & agency bonds	Corporate bonds	Covered bonds	Equities
Portfolio size (€ mn)	3 717	2 963	378	225	152
Total carbon emissions Scope 3 (tCO2e)	425 820 (80%)	317 973 (78%)	57 274 (82%)	28 397 (81%)	22 176 (100%)

Sources: Institutional Shareholder Services, Bloomberg, BCL calculations

Note: The percentages in the brackets below the metrics represent data availability, calculated as the percentage of investments for which all required data (i.e. emissions data and financial data) is available. The Portfolio size evaluates the investments in line with the accounting rules used in the official annual accounts, whereas the calculations of total carbon emissions are based on the nominal value.

Table 5: Scope 3 emissions for FX-denominated NMPPs

FX-denominated NMPPs	Non-sovereign	
	Total	Supranational & agency bonds
Portfolio size (€ mn)	9	9
Total carbon emissions Scope 3 (tCO2e)	58 (100%)	58 (100%)

Sources: Institutional Shareholder Services, Bloomberg, BCL calculations

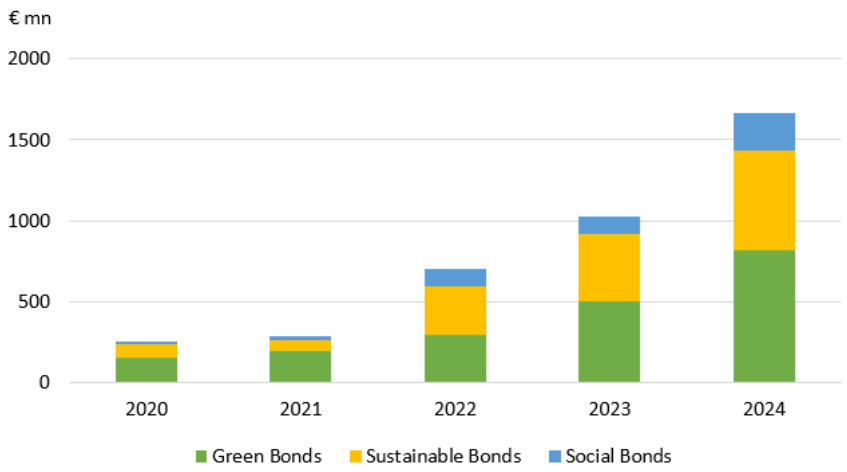
Note: The percentages in the brackets below the metrics represent data availability, calculated as the percentage of investments for which all required data (i.e. emissions data and financial data) is available. The Portfolio size evaluates the investments in line with the accounting rules used in the official annual accounts, whereas the calculations of total carbon emissions are based on the nominal value.

5.1.4 Green, Social and Sustainable Bonds

Since 2019, the BCL has increasingly invested in green, social and sustainable bonds. In 2024, the BCL made a strategic investment in the BIS euro-denominated green bond fund for central banks, with a view to further expand its sustainable investment strategy. The fund focuses on renewable energy production, energy efficiency and other environmentally friendly projects. The BIS green bond fund initiative facilitates the integration of environmental sustainability objectives within central banks, thereby complementing direct acquisitions of green bonds.

Notwithstanding the reallocation of the foreign currency-denominated green, social and sustainable assets in EUR-denominated bonds, contributing the substantial size increase of the EUR-denominated NMPPs, holdings of thematic bonds have increased by ca. € 644 mn across all NMPPs at the end of 2024 compared to the previous year. The chart below shows the evolution of the green, social and sustainable bond holdings over time.

Chart 5: Green, Sustainable and Social Bonds in the BCL's NMPPs



While the presence of such instruments among government bonds remained negligible, nearly half of supranational and agency bonds (Snats & Agencies) across EUR- and FX-denominated NMPPs had either a green, social or sustainable bond label. About 21% of the secured and unsecured corporate bond holdings were green bonds as of year-end 2024.

Holding bonds that are labelled green, social or sustainable does not have an immediate impact on the portfolio's carbon footprint as GHG emissions are collected at issuer level without considering any specific characteristics of a bond's use of proceeds. Nevertheless, such instruments are an integral part of BCL's ESG strategy as they support the issuers' transition towards a low-carbon economy by providing targeted financing to projects with positive environmental and social impacts.

5.2 Targets

The 2016 Paris Agreement committed to keep the rise in mean temperatures well below 2°C and aiming for 1.5°C above pre-industrial levels.[7] In accordance with the assessment provided by the Intergovernmental Panel on Climate Change (IPCC), GHG emissions need to be at 'net zero' by 2050 to keep global warming at 1.5°C.[8] Net zero refers to achieving an overall balance between GHG emissions produced and those taken out of the atmosphere.

Targets ensure forward-looking integration into the BCL climate risk management for NMPPs and reflect the BCL's commitment to reduce its investments' exposure to climate risks and improve its environmental footprint. In this context, the BCL aims to gradually decarbonise its own fund investments and targets an alignment with the objectives of the Paris Agreement to the extent possible.

[7] https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement
[8] https://www.ipcc.ch/sr15/chapter/spm/

The BCL's long-term and intermediary targets will be refined over time, from a qualitative and quantitative perspective, along with the growing experience, better data availability and methodological improvements.

6. Appendix

6.1 Historical GHG metrics

EUR-NMPPs	Sovereign Issuers			Non-sovereign Issuers				
	Sovereign and sub-sovereign bonds			Total	Supranational & agency bonds	Corporate bonds	Covered Bonds	Equities
	Production	Production incl. LULUCF	Consumption					
Portfolio Size (€ mn)								
2024	1 087			3 717	2 963	378	225	152
2023	679			2 022	1 745	164	0	113
2022	142			1 236	1 030	122	0	84
2021	228			441	154	164	0	123
2020	238			555	268	198	0	89
WACI (tCO2e / € mn revenue, GDP, or per capita)								
2024	134 (99%)	129 (99%)	13 (99%)	3 (82%)	<1 (79%)	14 (82%)	<1 (81%)	29 (100%)
2023	138 (99%)	134 (99%)	13 (99%)	11 (77%)	<1 (76%)	86 (67%)	0 (0%)	63 (100%)
2022	155 (95%)	143 (95%)	13 (95%)	21 (79%)	2 (75%)	114 (100%)	0 (0%)	67 (100%)
2021	210 (100%)	192 (100%)	15 (100%)	83 (85%)	2 (56%)	121 (100%)	0 (0%)	89 (100%)
2020	215 (100%)	198 (100%)	14 (100%)	87 (75%)	<1 (48%)	120 (100%)	0 (0%)	139 (100%)
Total carbon emissions (tCO2e)								
2024	146 718 (99%)	140 992 (99%)	189 469 (99%)	3 941 (80%)	185 (78%)	3 000 (82%)	16 (81%)	740 (100%)
2023	95 433 (99%)	92 140 (99%)	123 700 (99%)	7 656 (75%)	39 (75%)	5 764 (67%)	0 (0%)	1 852 (100%)
2022	21 483 (95%)	19 789 (95%)	29 008 (95%)	11 300 (53%)	35 (44%)	9 070 (100%)	0 (0%)	2 195 (100%)
2021	46 300 (100%)	42 350 (100%)	68 292 (100%)	15 597 (81%)	4 (50%)	10 600 (96%)	0 (0%)	4 993 (100%)
2020	48 235 (100%)	44 276 (100%)	67 860 (100%)	14 690 (64%)	2 (31%)	9 889 (94%)	0 (0%)	4 799 (100%)
Carbon footprint (tCO2e / € mn invested)								
2024	134 (99%)	129 (99%)	173 (99%)	1 (80%)	<1 (78%)	10 (82%)	<1 (81%)	5 (100%)
2023	138 (99%)	134 (99%)	179 (99%)	5 (75%)	<1 (75%)	51 (67%)	0 (0%)	16 (100%)
2022	155 (95%)	143 (95%)	210 (95%)	16 (53%)	<1 (44%)	71 (100%)	0 (0%)	26 (100%)
2021	210 (100%)	192 (100%)	310 (100%)	44 (81%)	<1 (50%)	69 (96%)	0 (0%)	41 (100%)
2020	215 (100%)	198 (100%)	303 (100%)	42 (64%)	<1 (31%)	54 (94%)	0 (0%)	54 (100%)
Green Bonds Share								
2024	3%			23%	23%	26%	14%	N/A
2023	1%			18%	17%	33%	0%	N/A
2022	5%			12%	9%	44%	0%	N/A
2021	0%			27%	19%	34%	0%	N/A
2020	0%			16%	16%	16%	0%	N/A
Sustainable Bonds Share								
2024	0%			18%	21%	0%	0%	N/A
2023	0%			19%	20%	0%	0%	N/A
2022	0%			20%	23%	0%	0%	N/A
2021	0%			10%	20%	0%	0%	N/A
2020	0%			9%	15%	0%	0%	N/A
Social Bonds Share								
2024	0%			7%	5%	9%	28%	N/A
2023	0%			4%	4%	0%	0%	N/A
2022	0%			7%	7%	0%	0%	N/A
2021	0%			0%	0%	0%	0%	N/A
2020	0%			0%	0%	0%	0%	N/A

FX-NMPPs	Sovereign Issuers			Non-sovereign Issuers	
	Sovereign and sub-sovereign bonds			Total	Supranational & agency bonds
	Production	Production incl. LULUCF	Consumption		
Portfolio Size (€ mn)					
2024	0			9	9
2023	14			181	181
2022	33			190	190
2021	28			178	178
2020	31			151	151
WACI (tCO2e / € mn revenue, GDP, or per capita)					
2024	0 /	0 /	0 /	2 (100%)	2 (100%)
2023	247 (100%)	214 (100%)	21 (100%)	<1 (85%)	<1 (85%)
2022	262 (100%)	231 (100%)	21 (100%)	2 (76%)	2 (76%)
2021	322 (100%)	283 (100%)	21 (100%)	4 (78%)	4 (78%)
2020	320 (100%)	277 (100%)	19 (100%)	4 (68%)	4 (68%)
Total carbon emissions (tCO2e)					
2024	0 /	0 /	0 /	<1 (100%)	<1 (100%)
2023	3 695 (100%)	3 197 (100%)	4 105 (100%)	4 (85%)	4 (85%)
2022	9 104 (100%)	8 021 (100%)	10 081 (100%)	6 (59%)	6 (59%)
2021	8 945 (100%)	7 881 (100%)	9 905 (100%)	5 (60%)	5 (60%)
2020	9 579 (100%)	8 311 (100%)	10 488 (100%)	7 (67%)	7 (67%)
Carbon footprint (tCO2e / € mn invested)					
2024	0 /	0 /	0 /	<1 (100%)	<1 (100%)
2023	247 (100%)	214 (100%)	275 (100%)	<1 (85%)	<1 (85%)
2022	262 (100%)	231 (100%)	291 (100%)	<1 (59%)	<1 (59%)
2021	322 (100%)	283 (100%)	356 (100%)	<1 (60%)	<1 (60%)
2020	320 (100%)	277 (100%)	350 (100%)	<1 (67%)	<1 (67%)
Green Bonds Share					
2024	0%			100%	100%
2023	0%			65%	65%
2022	0%			65%	65%
2021	0%			62%	62%
2020	0%			57%	57%
Sustainable Bonds Share					
2024	0%			0%	0%
2023	0%			21%	21%
2022	0%			20%	20%
2021	0%			22%	22%
2020	0%			25%	25%
Social Bonds Share					
2024	0%			0%	0%
2023	0%			12%	12%
2022	0%			11%	11%
2021	0%			12%	12%
2020	0%			14%	14%

6.2 Formulas for GHG metrics

Weighted Average Carbon Intensity (in tCO_2e / €M revenue, PPP adj. GDP, population)

$$WACI = \sum_{i}^{n} \left(\frac{current\ value\ of\ investment_i}{current\ portfolio\ value} \right) x \left(\frac{issuer's\ GHG\ emissions_i}{isseur's\ €M\ revenue\ or\ PPP\ adj.GDP\ or\ population_i} \right)$$

Total Carbon Emissions (tCO_2e)

$$Total\ Carbon\ Emissions = \sum_{i}^{n} \left(\frac{current\ value\ of\ investment_i}{EVIC\ or\ PPP\ adj.GDP_i} \right) x\ issuer's\ GHG\ emissions_i$$

Carbon Footprint **(tCO_2e per €M invested)**

$$Carbon\ Footprint = \frac{\sum_{i}^{n} \left(\frac{current\ value\ of\ investment_i}{EVIC\ or\ PPP\ adj.GDP_i} \right) x\ issuer's\ GHG\ emissions_i}{current\ portfolio\ value\ (€M)}$$

6.3 Carbon emissions allocation methods, normalization and attribution factors

Allocation				
Issuer type	**Factor**	**Remarks**	**Unit**	**Source**
Corporate	Scope 1 & 2 & 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 all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.	tCO_2e	ISS
Supra & Agency				
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 incl. LULUCF	Production emissions, as defined above, adjusted for the impact of human activities on carbon sicks through land use, land-use change and forestry.		ISS, UNFCCC
	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.		Carbon4 Finance
Normalisation				
Issuer type	**Factor**	**Remarks**	**Unit**	**Source**
Corporate	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	ISS, Bloomberg
Supra & Agency				
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.		World Bank
	Consumption: Population	Total population of a country.	People	
Attribution				
Asset class	**Factor**	**Remarks**	**Unit**	**Source**
Sovereign bonds	PPP adj. GDP	See description of "PPP adj. GDP" in normalisation	EUR million	World Bank
Equities	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.		ISS, Bloomberg
Supra & Agency bonds				