Carbon Footprint Report 2023

Greenhouse gas emissions resulting from internal operations of Národná banka Slovenska

NÁRODNÁ BANKA SLOVENSKA
EUROSYSTÉM

www.nbs.sk

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Glossary

coefficient	Emission factor, assumption, or unit conversion used to convert activity data (e.g. kWh electricity, tonnes of landfilled waste) to greenhouse gas emissions.
company structure	The set of sites, subdivisions and divisions that compose the organisational scope of a company.
company unit	An individual component of the company structure; it can be ‘site level’ (building blocks of the structure, representing individual facilities or departments) or ‘division level’ (aggregates all sites within it).
emission factor	Conversion factor to convert activity data (e.g. kWh electricity, tonnes of landfilled waste) to greenhouse gas emissions.
GHG	greenhouse gas
GWP	global warming potential A factor to convert a unit of a given GHG into a unit of CO_2e, based on its heat-trapping capacity relative to CO_2.
location-based method	One of two methods for calculating Scope 2 emissions under the GHG Protocol's Scope 2 Guidance, which reflects the average emissions intensity of grids on which energy consumption occurs.
market-based method	One of two methods for calculating Scope 2 emissions under the GHG Protocol's Scope 2 Guidance, which reflects emissions from indirect energy that companies have specifically chosen (or their lack of choice).
question group	A set of questions in a questionnaire, typically grouped into related items (e.g. premises, company-owned vehicles, business travel).
question	An individual question within a questionnaire requesting data for a specific source (e.g. electricity, company-owned cars, deliveries by motorcycle). Multiple answers of the same data type can be added to one question.
site type	Each site-level company unit must be tagged with a ‘site type’, which can be thought of as a facility or land type. Examples include offices, warehouses, manufacturing facilities, schools, and distribution centres, among others.
tCO_2e	Metric tonnes of carbon dioxide equivalent.
value	Numerical value of an individual answer for activity data, expressed in a given unit (e.g. 100 kWh, 3 kg).

Summary

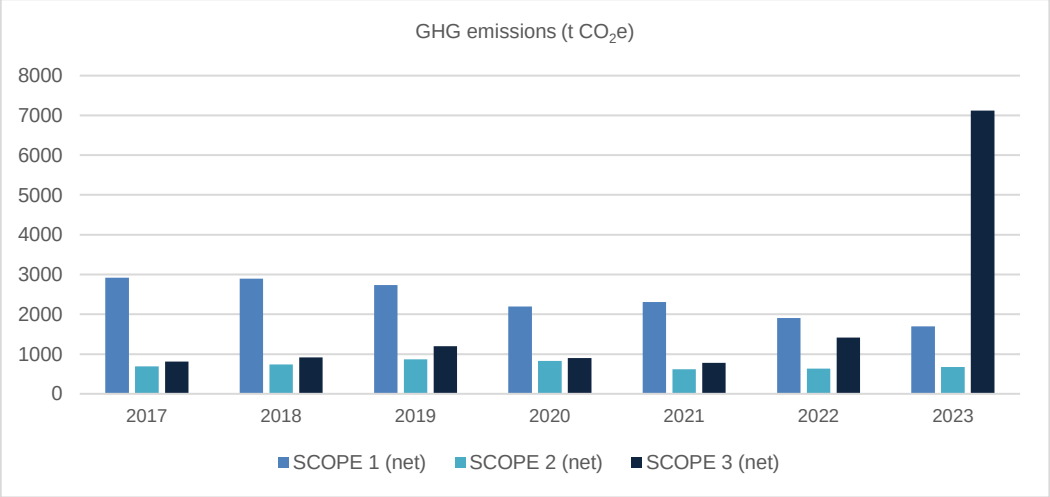
This report outlines the carbon footprint of Národná banka Slovenska (NBS) for 2023. It covers Scopes 1 (direct emissions), 2 and 3 (indirect emissions) in accordance with the Greenhouse Gas Protocol. The calculation was carried out using the Ecometrica tool.[1] Compared with 2022, the scope of reporting has been significantly expanded, particularly within Scope 3 categories, resulting in a total carbon footprint of 9.489 tCO_2e.

In addition to the original dataset used in the 2017–2022 reports, three additional Scope 3 subcategories were introduced.[2] The Scope 3 subcategories *Purchased goods and services* and *Capital goods* were significantly expanded using the spend-based method.[3] Furthermore, well-to-tank emissions and emissions from hotel stays were included for the first time. All changes are detailed in the disclosed methodology. Chart 1 shows the emission sources reported under each scope and their developments over the past seven years. A 12% reduction in Scope 1 emissions is attributed to decreased gas and diesel consumption, with refrigerant-related emissions reduced to zero in 2023.[4] Conversely, Scope 2 emissions increased by 7%, primarily due to higher electricity consumption during the year. A more than fivefold increase in reported Scope 3 emissions is mainly due to the inclusion of several new reporting activities under the categories of *Purchased goods and services* and *Capital goods*.

Organisational boundaries were also revised in 2023. The 2023 reported emissions now include emission sources from properties[5] owned by NBS in Kremnica and Starý Smokovec, and from regional offices.

The methodology is expected to be further refined over time, with ongoing improvements in data granularity and overall accuracy.

Chart 1
Reported emission sources



Source: NBS.

SCOPE 1

- Natural gas
- Direct fuel consumption (includes own/leased fleet use and direct diesel use in buildings)

[1] Ecometrica tool: https://www.ecoonline.com/esg-software/
[2] Added Scope 3 subcategories: *Upstream leased assets*, *Downstream leased assets*, *Investments*.
[3] There are newly added emissions from IT software/hardware, coinage, construction works and maintenance.
[4] NBS reported zero emissions from refrigerants also in 2020 and 2021.
[5] Labelled in the Ecometrica tool as Kremnica (Museum of Coins and Medals and adjacent buildings forming the complex) and VÚZ Bystrina (multipurpose facility).

SCOPE 2
- Electrical energy
- BAT (charging of battery electric vehicles)

SCOPE 3
- Purchased goods and services[6]
- Capital goods[7]
- Fuel and energy-related activities[8]
- Waste generated in operations
- Business travel
- Employee commuting[9]
- Upstream leased assets
- End-of-life treatment of sold products[10]
- Downstream leased assets
- Water consumption
- Investments[11]

Total emissions grew by approximately 154%, increasing from 3.9 thousand tonnes of CO_2e to 9.9 thousand tonnes in 2023, mainly due to the expansion of the Scope 3 category.

In the 2023 reporting period, NBS neither offset any unavoidable emissions nor reported avoided emissions from material recovery projects.[12] Such projects will be introduced in the follow-up action plan.

Table 1 below summarises question groups by the Ecometrica tool, the respective emissions per question, and the percentage share of overall emissions for the organisation.

Table 1
Distribution of calculated emissions for 2023 according to question groups

Question groups by the Ecometrica tool	tCO_2e	% share
Purchased goods and services (Scope 3)	3575.431	37.68%
Capital goods (Scope 3)	2127.364	22.42%
Gas (Scope 1)	1474.324	15.54%
Electrical energy (Scope 2)	975.036	10.28%
Commuting (Scope 3)	449.699	4.74%
Business travel (Scope 3)	415.198	4.38%
Direct fuel consumption: Company vehicles (Scope 1)	258.379	2.72%

6 More than 63 reported categories, including *office paper and other equipment*.
7 More than 22 reported categories.
8 Includes fuel and energy-related activities that are not included in Scope 1 or Scope 2. This category is then not specifically described in the indirect emissions chapter.
9 Includes staff commute, teleworking.
10 Includes waste treatment of banknotes.
11 Those are reported separately as the financed emissions category.
12 A methodological approach based on recovered content and project methods, enabling estimation of avoided emissions, is described in the document 'Methodology for avoided GHG emissions calculation'. Future NBS projects in this area will be based on this methodology.

Upstream leased assets (Scope 3)	88.156	0.93%
Downstream leased assets (Scope 3)	75.805	0.80%
Waste generated in operations (Scope 3)	37.929	0.40%
Water consumption (Scope 3)	4.487	0.05%
End-of-life treatment of sold products (Scope 3)	4.325	0.05%
Direct fuel consumption: Facility fuel use (Scope 1)	2.495	0.03%
Total	9488.629	100%

Source: Ecometrica.

1 Emissions related to the operation of NBS's premises

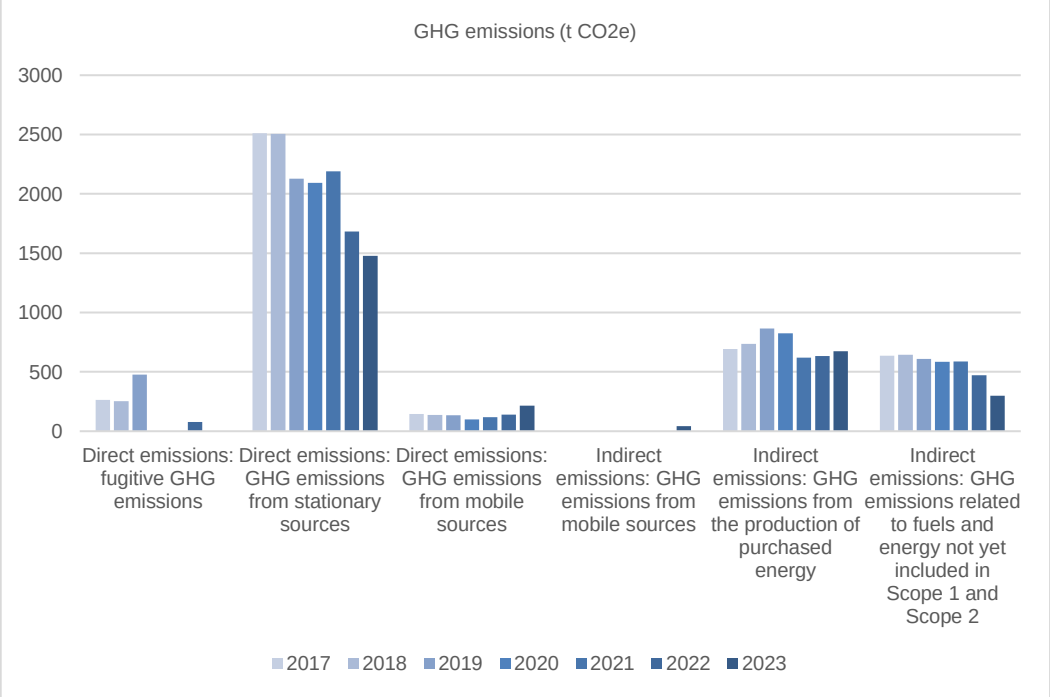
Emissions from the operation of NBS's premises resulting from natural gas and fuel use are counted as direct emissions in Scope 1 and indirect emissions in Scope 3.[13] Emissions from the company's vehicle fleet are also categorised under Scope 1. The fleet consists of diesel, petrol, and BEV[14] passenger cars, as well as diesel-powered transport vehicles. Emissions are calculated based on either the distance travelled or the amount of fuel consumed.

In 2023, Scope 1 and 2 emissions accounted for 24% of NBS's total carbon footprint, decreasing in both absolute and relative terms, owing to the considerable extension of Scope 3 emissions reported activities.

Emissions from the electrical energy consumption are counted as indirect emissions in Scope 2 and Scope 3.[15] In this report, Scope 2 emissions are reported following the location-based approach, while market-based emissions are noted in the Ecometrica tool.

Chart 2 shows a comparison of emissions from the operation of NBS's premises over the period 2017–2023. Indirect emissions from mobile sources, along with direct emissions from those sources, represent 'well-to-tank' emissions. A more detailed explanation is provided in the disclosed methodology.

Chart 2
Operation of NBS's premises in the years 2017–23



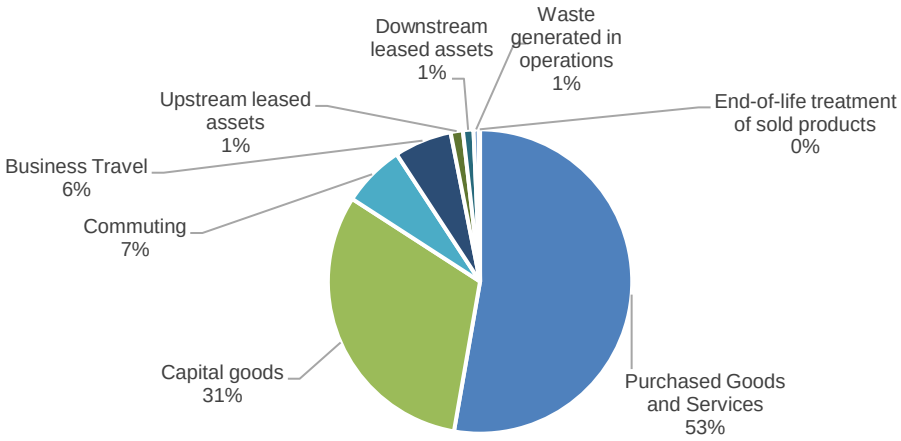
Source: NBS.

[13] Those are upstream emissions from the direct diesel consumption in NBS's premises, use of vehicles, including Electricity grid and T&D losses from the use of medium battery electric car.
[14] Battery electric vehicle.
[15] Those are emissions from electricity and electricity grid transmission and distribution losses.

2 Indirect emissions

In 2023, indirect emissions under Scope 3 accounted for 75% of NBS's carbon footprint. To compare, the ECB's indirect emissions under Scope 3 accounted for 89.9% in 2023.[16] Chart 3 shows the composition of the 2023 Scope 3 emissions category.

Chart 3
Composition of 2023 Scope 3 emission categories



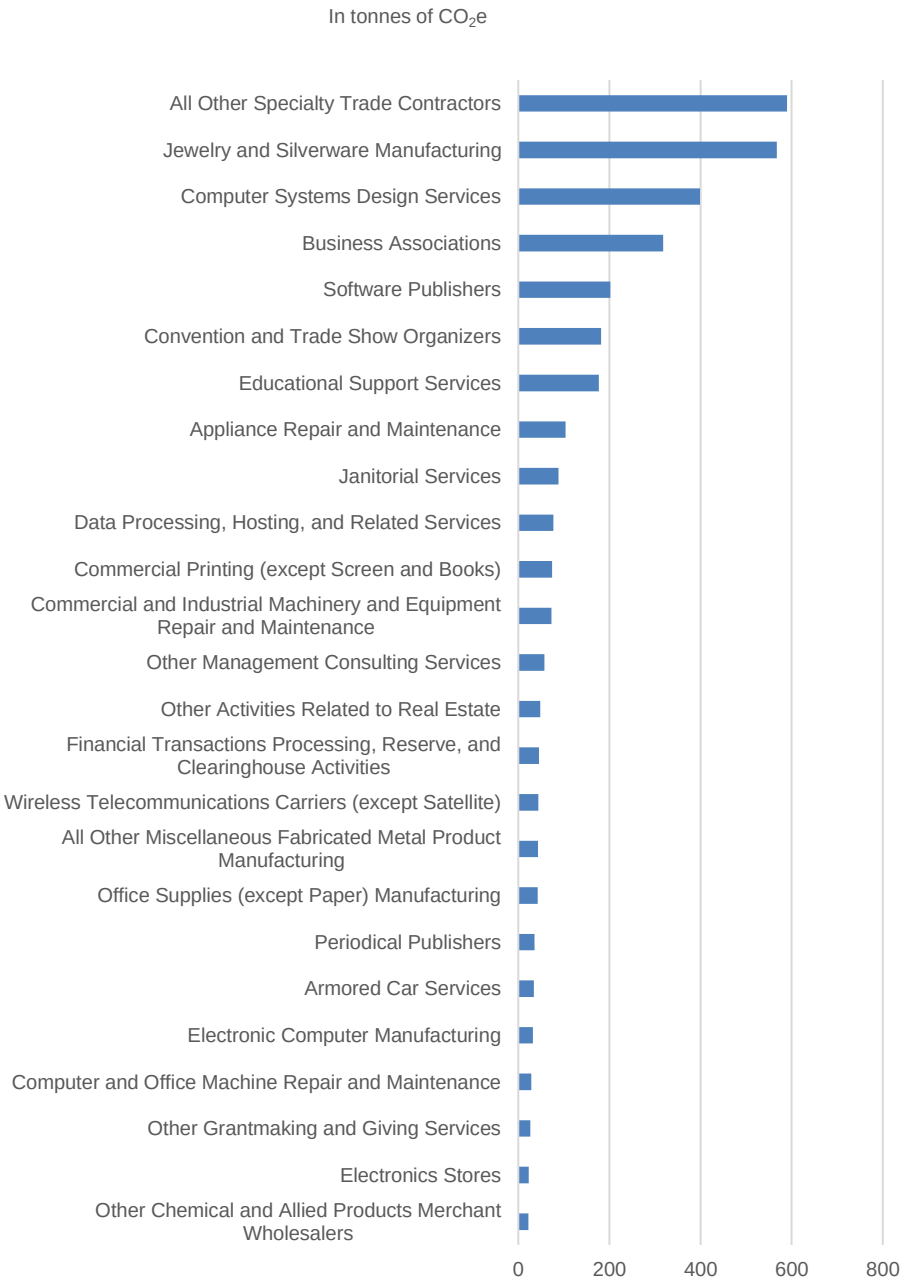
Source: NBS.

2.1 Purchased goods and services

This category includes estimated emissions from the purchase of various services, coinage, computer services, membership fees, software, events, educational support services, purchased repair, maintenance and cleaning services, as well as various professional, scientific, and technical services, consultancy services, office supplies, and other related expenses. Chart 4 presents a subset of activities from the *Purchased goods and services* category, each with total greenhouse gas (GHG) emissions exceeding 20 metric tonnes of CO_2e. The NAICS classified activity Specialty Trade Contractors involves repairs and maintenance performed in NBS's premises, whilst the major portion of the works was realised in Bratislava. The minting of coins falls under Jewellery and Silverware Manufacturing. NBS's contributions to legal entities are covered by the Business Associations category, representing payments mandated by the membership of NBS or its authorised employees in domestic or foreign institutions, e.g. EBA, ESMA, INOlab, EIOPA, EPCO.

[16] The ECB's Environmental Statement 2023

Chart 4
Purchased goods and services: The most significant GHG-emitting activities



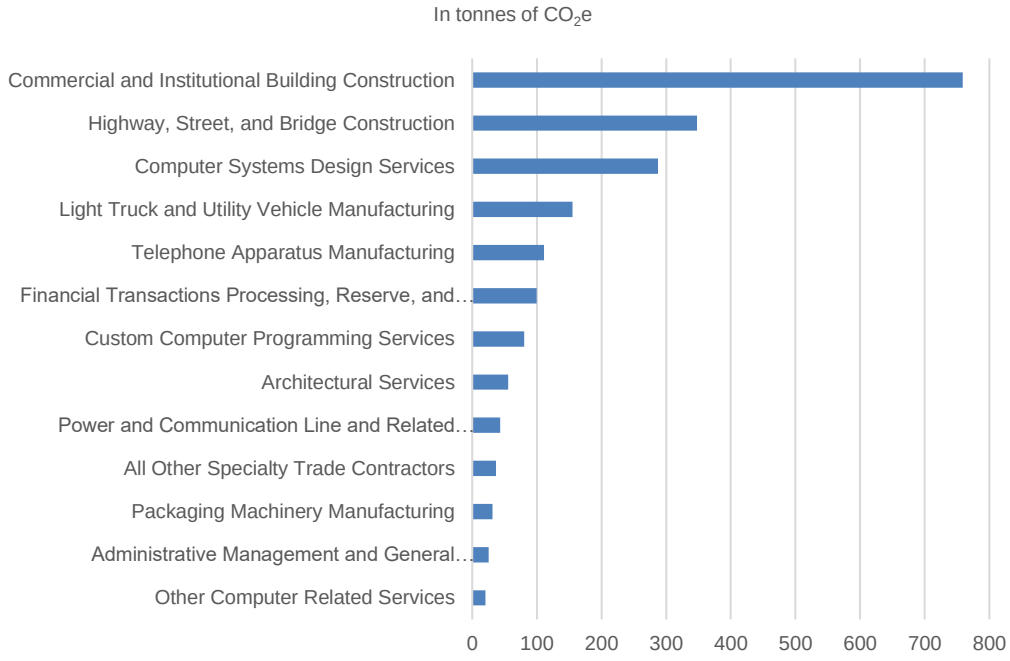
Source: Ecometrica.

2.2 Capital goods

Unlike purchased goods and services, capital goods are represented with capitalised expenditures regarded by NBS as investments. Subcategories contributing the most to overall capital goods emissions are investments in buildings and fleet. Chart 5 shows a selection of activities that emitted more than 20 tonnes CO_2e per activity during the 2023 period. The most significant GHG-emitting activities are building and infrastructure construction activities, IT services, and the purchase of new vehicles. The execution of financial transactions is also classed as an emission-intensive activity.

An investment in a coin processing and packaging facility is included under Packaging Machinery Manufacturing.

Chart 5
Capital goods: The most significant GHG-emitting activities



Source: Ecometrica.

2.3 Waste generated in operations

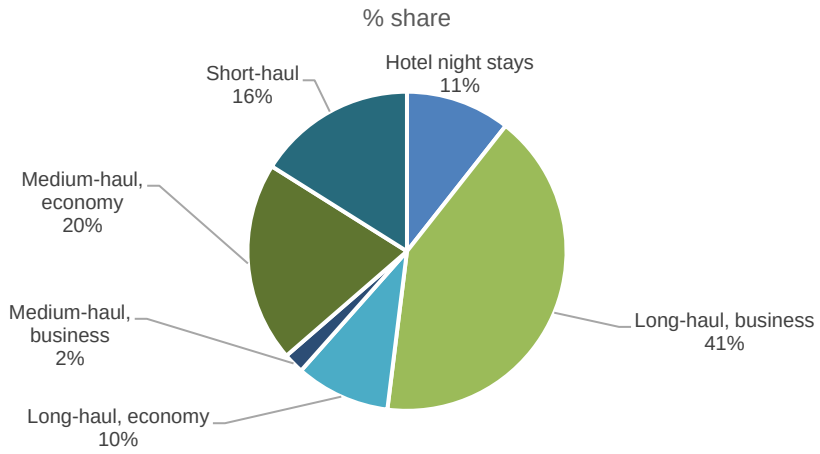
Emissions are calculated from different modes of waste treatment. Cooking oil, plastics, mixed paper, and cardboard are being recycled. Hazardous waste goes through a process of recycling as well. Part of the collected waste is sent for incineration or anaerobic digestion. The rest of the generated waste is landfilled. Landfilled waste accounts for 84% of the overall GHG emissions of the *Waste generated in operations* category.

2.4 Business travel[17]

The *Business travel* category includes flights and overnight hotel stays. Flights are classified as short-haul, medium-haul (economy or business) and long-haul, with each category further divided into economy and business class. The contribution of each option to the total emissions from business travel is shown in Chart 6.

[17] Referred in the Ecometrica tool as *Company vehicles*.

Chart 6
Business travel: The most significant GHG-emitting activities



Source: Ecometrica.

2.5 Employee commuting and teleworking[18]

In August 2023, NBS conducted a staff mobility survey to estimate emissions associated with teleworking and commuting. The survey results were incorporated in NBS's 2023 carbon footprint report. The applied homeworker model includes three distinct energy demands – home office equipment, space heating, and space cooling.[19] The model also includes room lighting and assumes that a typical working day lasts 8.5 hours. Table 2 shows the percentage share of every considered mode of transport on overall emissions in the *Employee commuting* category. Travel by foot, scooter, skateboard, and bicycle is considered to have zero emissions by Ecometrica (regardless of the reported number of kilometres). In 2023, emissions from employee commuting and teleworking were estimated using a slightly different approach within the Ecometrica tool. Changes in the methodological approach, compared with the period from 2017 to 2022, are explained in the disclosed methodology.

Table 2
Distribution of calculated emissions for 2023 according to question groups

Row labels	Sum of tCO_2e	% share
Slovakia homeworker[20]	185.901	41.3%
Medium petrol car	44.261	9.8%
Car passenger - Average car	30.138	6.7%
City bus	29.812	6.6%
Large diesel car	26.449	5.9%

[18] Referred in the Ecometrica tool as 'Commuting'.
[19] 2021: The Ecometrica Homeworker Model. Estimating the additional energy consumption and associated greenhouse gas emissions from homeworking.
[20] Slovakia homeworker: Ecometrica uses a specific adaptation of its methodology for Slovakia. Teleworking hours are recorded as 'Slovakia homeworker' in the Ecometrica tool.

Average petrol car	24.968	5.6%
Medium diesel car	24.786	5.5%
Large petrol car	24.714	5.5%
Small petrol car	16.733	3.7%
Large hybrid car	8.218	1.8%
Small diesel car	7.661	1.7%
Intercity/National train	7.601	1.7%
Medium hybrid car	5.600	1.2%
Average diesel car	5.405	1.2%
Average hybrid car	4.789	1.1%
Coach	2.077	0.5%
Average petrol motorcycle	0.585	0.1%
On foot	0	0%
Scooter/Skateboard	0	0%
Standard bicycle	0	0%

Source: Ecometrica.

2.6 Upstream leased assets

This category includes emissions from leased premises or equipment. In other words, leases NBS pays for. Emissions in this category are calculated using the spend-based method. The emissions resulting from this category are displayed in Table 1.

2.7 End-of-life treatment of sold products

Banknotes are recovered at the end of their life cycle through energy recovery. In addition to emissions from the energy recovery process itself, total emissions also include those from transporting banknotes to recovery facilities. These emissions are presented in Table 3. NBS applies a consistent ADEME emission factor[21] to calculate emissions from banknote recovery for

[21] 0.12 tCO_2e/t

the period 2020–2023. Table 3 provides an overview of the total mass of recovered banknotes during this period. The number of banknotes sent for recovery depends on factors beyond the control of NBS; therefore, the associated emissions can be considered locked in.

Table 3
Banknotes sent for energy recovery and respective emissions

	2020	2021	2022	2023
Mass (tonnes)	21.04	17.38	16.83	27
Total emissions (tCO_2e/t)	2.53	2.09	2.02	3.25

Source: NBS.

2.8 Downstream leased assets

Emissions from downstream leased assets are based on calculated energy intensities of office space leased by NBS to other entities. The leased premises are in Bratislava and Lučenec and cover a total area of 2,318 m^2. Resulting emissions from this category amounted to 75.80 tCO_2e, representing 0.80% of NBS's total emissions. This emission category was calculated for the first time in 2023.

2.9 Water consumption

NBS monitors non-technical water consumption on its premises. Non-technical water consumption includes the amount of water used for processes in kitchenettes, canteens and sanitary facilities. Emissions from this category amounted to 4.487 tCO_2e, representing 0.05% of NBS's total emissions.

2.10 Investments

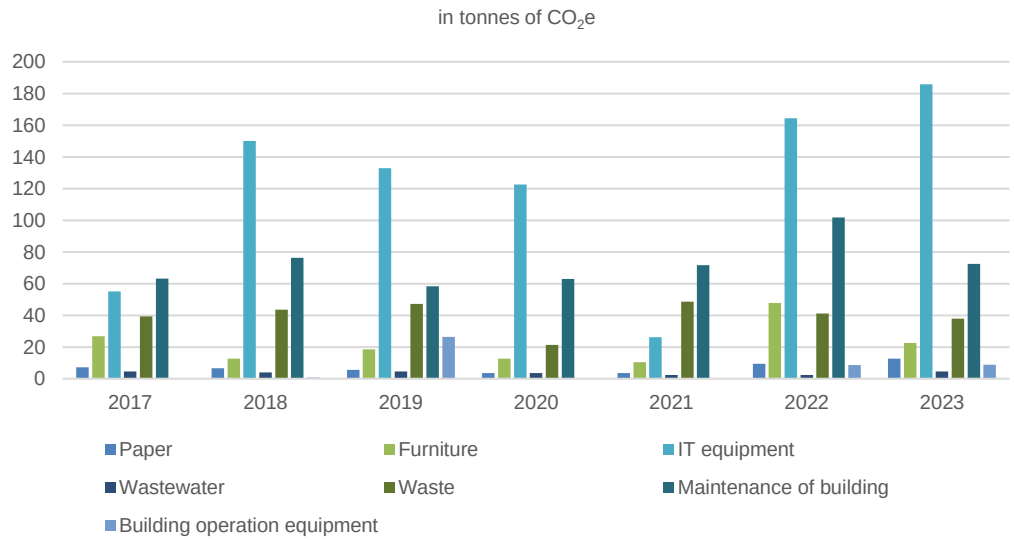
GHG emissions from NBS's non-monetary policy portfolio are disclosed in the annual publication *Climate-related disclosures of Národná banka Slovenska's non-monetary policy portfolios*.[22] GHG emissions here are estimated from sovereign and sub-sovereign bonds, supranational and agency bonds, corporate bonds, and covered bonds.

[22] The report is available on the NBS website at: https://nbs.sk/en/publications/climate-related-disclosures-of-nbs-non-monetary-policy-portfolio/

3 Other activities

Since 2017, NBS has annually tracked various miscellaneous activities and their associated emissions. These developments are shown in Chart 7. Emissions associated with categories such as paper, furniture, IT equipment, building maintenance and equipment for building operation were estimated using the spend-based method. The specific accounts used to define these categories are detailed in the disclosed methodology.

Chart 7
Other activities tracked by NBS



Source: NBS.

4 Methodology

4.1 General information

The calculation of GHG emissions of Národná banka Slovenska (hereinafter 'NBS' or 'the organisation') for Scope 1, Scope 2, and Scope 3 was conducted using the Ecometrica tool.[23] The basic parameters of the calculation are as follows:

- **Emission reporting protocols used:** GHG Protocol (dual market-based and location-based reporting) and ISO 14064-1.
- **Source of global warming potential (GWP) indicators:** IPCC Fifth Assessment Report (AR5).[24]
- The organisation's emissions are not part of any regulated emissions trading system, and the organisation does not generate any biogenic CO_2 emissions from biomass combustion or biodegradation.
- **Timeframe and base year:** Emissions are calculated for the financial year 2023, which also serves as the base year.
- **Methods used to estimate emissions:**
  - direct measurement (DM)
  - activity data (AD)
  - supplier-specific method (SSM)
  - average-data method (ADM)
  - hybrid method (HM)
  - spend-based method (SBM)
- Calculations based on the SBM method are marked as estimates with 30% uncertainty.
- **Organisational boundaries:** Emissions are reported for all entities under the operational control of NBS. Within the Ecometrica tool, the organisation is divided into three entities, and emissions are reported both collectively and separately for each of them:

  1. **NBS buildings in Bratislava:**
     - Národná banka Slovenska, headquarters, Imricha Karvaša 1, 813 25 Bratislava
     - Office building at Cukrová 8
  2. **NBS regional offices:**
     - Národná banka Slovenska, regional office, Národná 10, 975 77 Banská Bystrica
     - Národná banka Slovenska, regional office, Slovenskej jednoty 14, 041 41 Košice
     - Národná banka Slovenska, regional office, Antona Bernoláka 74, 010 01 Žilina
     - Národná banka Slovenska, regional office, Dostojevského 4444/26, 058 02 Poprad
     - Národná banka Slovenska, regional office, T. G. Masaryka 3, 940 62 Nové Zámky
  3. **Other NBS facilities:**
     - Bystrina multipurpose facility in the High Tatras (VÚZ Bystrina, Nový Smokovec 21, 062 01 Vysoké Tatry)
     - Building complex owned by NBS in Kremnica, consisting of the following: NBS Museum of Coins and Medals – administrative building,

[23] Ecometrica
[24] IPCC (2013). IPCC Fifth Assessment Report: Climate Change 2013. Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge.

Štefánikovo nám. 11/21, 967 01 Kremnica; Národná banka Slovenska, Historic Townhouse – permanent exhibition, Štefánikovo nám. 32/38, 967 01 Kremnica; Národná banka Slovenska, Museum of Coins and Medals – *Two Faces of Money* exhibition, Štefánikovo nám. 10/19, 967 01 Kremnica; Národná banka Slovenska, Gallery – exhibition spaces, Štefánikovo nám. 33/40, 967 01 Kremnica; Národná banka Slovenska, Town Castle, Zámocké nám. 568/1, 967 01 Kremnica

- The CO_2e emissions calculation includes emissions of carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and other fluorinated greenhouse gases, including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). These are reported collectively as *other gases*. An overview of the gas categorisation and their respective GWP values is provided in Table 4.

Table 4
Composition of gases defined by the Kyoto Protocol

GHG	GWP	Source
CO_2	1	IPCC (2013). IPCC Fifth Assessment Report: Climate Change 2013. Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge.
CH_4	28	IPCC (2013). IPCC Fifth Assessment Report: Climate Change 2013. Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge.
N_2O	265	IPCC (2013). IPCC Fifth Assessment Report: Climate Change 2013. Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge.
CO_2e	1	IPCC (2013). IPCC Fifth Assessment Report: Climate Change 2013. Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge.
CO_2e (other gases)	1	IPCC (2013). IPCC Fifth Assessment Report: Climate Change 2013. Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge.

4.2 Theoretical framework

Calculation scope and data collection methods

The applied methodological approach is based on a core reference document[25] and a set of detailed methodological guidelines developed separately for the calculation of Scope 1 and 2[26] and Scope 3 emissions.[27]

Scope 1 emissions

These are direct GHG emissions originating from sources that are controlled or owned by the organisation. Within Scope 1, the following emission categories were included:

- **Stationary combustion:** Emissions from boilers, furnaces, and other stationary equipment.
- **Mobile combustion:** Emissions from vehicles and other mobile sources. The calculation includes the vehicle fleet owned or leased by NBS.
- **Fugitive emissions:** Emissions resulting from gas leaks, for example, from refrigeration equipment. The calculation includes refrigerant leaks; however, according to available records, no such leaks occurred during the reporting year 2023.

[25] GHG Protocol: A Corporate Accounting and Reporting Standard (Revised Edition).

[26] Scope 1 and 2 GHG Inventory Guidance.

[27] Corporate Value Chain (Scope 3) Standard.

- **Scope 0 emissions** were defined as emissions from gases that do not contribute to the greenhouse effect and are therefore considered to have zero emissions: SOx, NOx, particulate matter (PM), carbon monoxide (CO), and total organic carbon (TOC).

Scope 2 emissions

These are indirect emissions associated with the purchase of electricity, steam, heat, or cooling. A dual approach was applied (dual market-based and location-based reporting), which means that two parallel and equally valid results are provided:

- **Location-based method:** Emissions calculated using average emission factors for electricity in the relevant location.
  - For the NBS Bratislava entity, the location was defined as *Bratislava Region*.
  - For the remaining organisational units, the location was defined as *Slovakia*.
- **Market-based method:** Emissions calculated using supplier-specific emission factors.
  - Since the energy supplier did not provide emission factors for 2023, default factors listed in Table 2 were used.

The energy mix remained unchanged during the 12-month reporting period. Its composition is presented in Table 5.

Table 5
Market-based method: Emission factors used

Energy type	kg CO_2e/kWh	Share (invoice no. 052304861)	Share (kg CO_2e/kWh)	Source of the emission factor
Hydropower	0.003910292	0.09	0.000351926	Ecoinvent V3.7.1 (2020) - k12820 - electricity, high voltage//[SK] electricity production, hydro, run-of-river
Nuclear	0.00646789	0.53	0.003427982	Ecoinvent V3.7.1 (2020) - k13131 - electricity, high voltage//[SK] electricity production, nuclear, pressure water reactor
Wind energy	0.014167937	0.01	0.000141679	Ecoinvent V3.7.1 (2020) - k13832 - electricity, high voltage//[SK] electricity production, wind, 1-3MW turbine, onshore
Coal	0.9406	0.18	0.169308	IEA (2020) Emissions per kwh of electricity only (kgCO_2/kWh)
Natural gas	0.3207	0.16	0.051312	IEA (2020) Emissions per kwh of electricity only (kgCO_2/kWh)
Biofuels	0.9861	0	0	IEA (2020) Emissions per kwh of electricity only (kgCO_2/kWh)
Solar power	0.071595366	0.03	0.002147861	Ecoinvent V3.7.1 (2020) - k17078 - electricity, low voltage//[RoW] electricity production, photovoltaic, 3kWp flat-roof installation, multi-Si
Applied market-based component			0.226689448	

Scope 3 emissions

These are indirect greenhouse gas emissions arising in the organisation's value chain. They include 15 categories:

- **Category 1** [Purchased goods and services]: Emissions associated with the production of purchased goods and services. A detailed methodological explanation of this subcategory is found in the document 'Methodology for using operating expenses (OpEx) and capital expenditures (CapEx) in estimating emissions in selected Scope 3 categories'.
- **Category 2** [Capital goods]: Emissions associated with the production of capital goods such as machinery and buildings. A detailed methodological explanation of this subcategory is found in the document 'Methodology for using operating expenses (OpEx) and capital expenditures (CapEx) in estimating emissions in selected Scope 3 categories'.
- **Category 3** [Fuel and energy-related activities]: Emissions associated with fuel and energy production and transportation. These are emissions from production and distribution losses of energy carriers. The Ecometrica tool transparently reports them under fuel and energy-related emissions.
- **Category 4** [Upstream transportation and distribution]: Emissions from transportation and distribution of purchased goods. NBS has no activities in this area.
- **Category 5** [Waste generated in operations]: Emissions from waste generated during operations. Data for emissions estimation are obtained from waste generation and management reports.
- **Category 6** [Business travel]: Emissions from employee business travel. This category contains data on employee flights and overnight stays in foreign hotels.
- **Category 7** [Employee commuting]: Emissions from employee commuting to work and teleworking. Information about employee commuting is obtained from a questionnaire survey conducted in August 2023, whose results were also used for the 2022 calculation.
- **Category 8** [Upstream leased assets (organisation pays rent)]: Emissions from leased assets not included in Scope 1 and 2. NBS has operating expenses related to renting premises and equipment for various purposes.
- **Category 9** [Downstream transportation and distribution]: Emissions from transportation and distribution of sold goods. Since NBS does not pay a third party for currency transportation but conducts it using its own fleet, emissions from this transportation are counted in Scope 1.
- **Category 10** [Processing of sold products]: Emissions from further processing of sold products. NBS does not create/manufacture any semi-finished products that would require further processing.
- **Category 11** [Use of sold products]: Emissions from the use of sold products. Banknotes and coins as currency do not require 'maintenance' and their use does not directly create additional greenhouse gas emissions.
- **Category 12** [End-of-life treatment of sold products]: Emissions from disposal of sold products. Collector coins are not processed and have no defined end-of-life cycle. Circulation coins were not withdrawn from circulation and processed in 2023. NBS reports emissions from energy recovery of banknotes; this calculation for 2023 is performed in the same manner as in the previous period.
- **Category 13** [Downstream leased assets (organisation receives income from lease)]: Emissions from leased assets not included in Scope 1 and 2. NBS leases premises in buildings at I. Karvaša, Cukrová 8 in Bratislava, and in buildings in Lučenec. Emissions are estimated from the total leased area.
- **Category 14** [Franchises]: Emissions from franchise operations. NBS does not use such licences.
- **Category 15** [Investments]: Emissions from the organisation's investments. This category contains total carbon emissions (Scope 1 and 2 in tCO_2e reported as Scope 3 in Category 15) from non-monetary policy portfolios (government and non-government issuers).

4.3 Summary of the methodological approach

Below are the calculation descriptions in the Ecometrica tool.

Scope 1 emissions

Table 6
Activities from which Scope 1 emissions were estimated

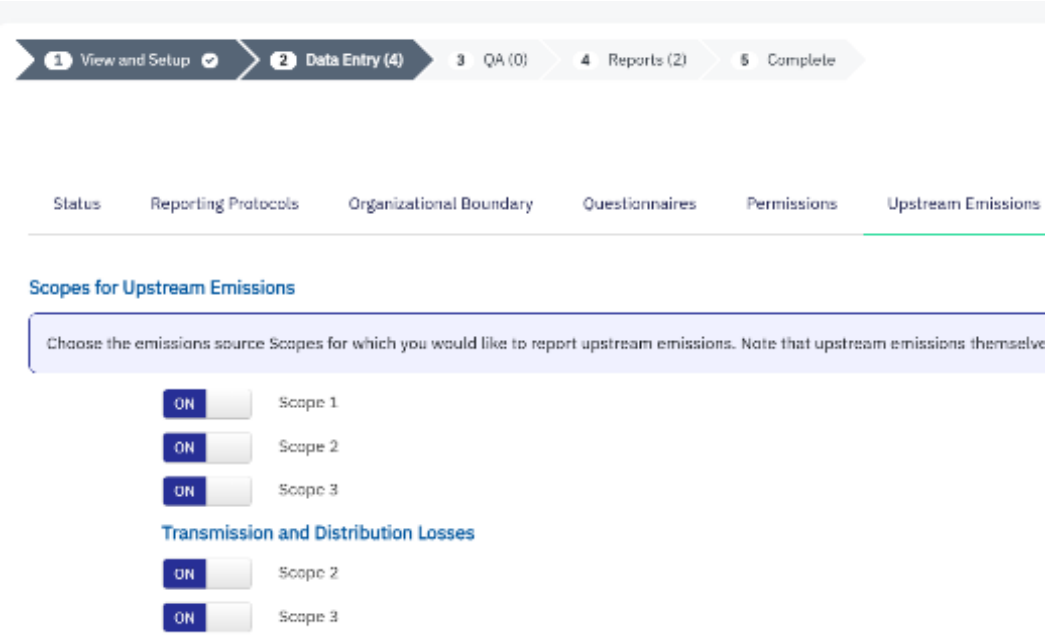
Activity	Data source	Method	Methodological note
Gas consumption	Invoices	AD	Applied emission factor for Gross Consumption Calorific Value, also known as higher heating value, representing the amount of heat released by complete fuel combustion.
Fleet mileage	Internal records	DM, AD	Where records of actual consumption were not available, we based this on mileage. Either engine size or weight category was used as a vehicle size parameter. The Ecometrica tool shows identical emissions in the *Large diesel car* and *Medium diesel car* categories, as well as in the *Large petrol car* and *Medium petrol car* categories; in these cases, we always chose the large category. None of the cars used by NBS has a petrol engine capacity of less than 1.4 litres or a diesel engine capacity of less than 1.7 litres; therefore, the category *Small* was not used in any of the cases. The *Large diesel van* category was used in the Mercedes Vito, Multicar Fumo, VW Caravelle and Toyota Land Cruiser cases. The difference in emissions between the large van and medium van categories is insignificant. The category *Articulated HGV (3.5-33t) average load* was used for the Mercedes Benz Actros. The abbreviation HGV stands for Heavy Goods Vehicle and is used for trucks weighing more than 3.5 tonnes. An articulated HGV consists of a tractor and a semi-trailer, which are connected by a joint (articulation). Average load is used for normal loads. Fleet raid emissions are calculated in accordance with the well-to-tank principle. As shown in Chart 8, this calculation is enabled by Ecometrica in the 'Upstream emissions' section by selecting the option to calculate emissions from the 'top' of the value chain.
Diesel consumption by backup systems	Internal records	DM	For locations in Slovakia, Ecometrica uses net calorific value (NCV) factors. The NCV (or lower calorific value) does not take into account the latent heat of vaporisation of water and is more representative of fuel combustion under realistic conditions. The emissions in Ecometrica are estimated from pure (100% mineral) diesel that has not been blended with biofuel, even though the biocomponent content of diesel according to Law No 309/2009 on the promotion of renewable energy sources should be 8.6% for the year 2023. According to the GHG Protocol for the Agri-sector,[28] biogenic emissions should be reported separately and not counted in the organisation's emissions. The GHG Protocol[29] justifies this practice by stating that the carbon released by biomass burning was previously absorbed by plants (i.e. taken out of the atmosphere by photosynthesis), thus assuming the cyclical nature of these emissions (i.e. their overall zero value). Emissions from the biogenic component of diesel would thus not represent an increase in the organisation's emissions. Due to the lack of PCF analysis[30] of diesel, we do not quantify them.
Coolant leaks	Internal records	DM	No fluorinated greenhouse gas leaks were detected during the monitoring period.

[28] GHG Protocol Agricultural Guidance, p. 16.
[29] GHG Protocol: A Corporate Accounting and Reporting Standard (Revised Edition), p. 88.
[30] Product Carbon Footprint.

Clarifications on Scope 1 emissions

- The measurements of fluorinated GHG leakages relate to stationary air conditioning, refrigeration, heat pumps and gas fire extinguishing equipment.
- For fleet raids, Ecometrica calculates identical emissions in the *Large diesel car* and *Medium diesel car* categories, as well as in the *Large petrol car* and *Medium petrol car* categories.
- We consider a car with a battery capacity between 40 kWh and 80 kWh to be a medium electric car. The Volkswagen ID.431 used by NBS has a battery capacity of 52 kWh or 77 kWh, which puts it in the *Medium battery electric car* category.
- A portion of the emissions from fleet mileage and direct diesel consumption is reported in Ecometrica as upstream emissions and is thus part of Scope 3 of the upstream emissions value chain.

Chart 8
Settings in Ecometrica to allow well-to-tank emissions calculation



Scope 2 emissions

Table 7
Activities from which Scope 2 emissions were estimated

Activity	Data source	Method	Methodological note
Electricity consumption	Invoices	AD	The Ecometrica tool uses what is known as dual reporting, i.e. both a market-based method and a location-based method.

Clarifications on Scope 2 emissions

Part of the emissions from electricity consumption is reported in Ecometrica as upstream emissions (emissions from generation and emissions from electricity distribution losses) and is thus part of Scope 3. NBS purchases electricity from a supplier and does not own the generation equipment or the distribution network.

[31] https://www.drivingelectric.com/volkswagen/id4/range

Scope 3 emissions

Table 8

Activities from which Scope 3 emissions were estimated (categories where NBS does not carry out activities are not included)

Activity	Activity categorisation	Data source	Method	Methodological note
Operating costs	Category 1 [Purchased goods and services]	NBS accounting records	SBM	Category 1 is classified as *Purchased goods and services* in Ecometrica. Activities in this category are found in both the CapEx and OpEx sub-accounts, which does not represent a methodological error. The fact that this is a capital expenditure is determined by the category name *Purchased goods and services*.
Capital expenditure	Category 2 [Capital Goods]	NBS accounting records	SBM	Category 2 is classified in Ecometrica as *Capital goods*'. Activities in this category are found in both the CapEx and OpEx sub-accounts, which does not represent a methodological error. The fact that it is a capital expenditure is determined by the category name *Capital goods*. The use of the cost method (SBM) does not replace the calculation of the Product Carbon Footprint (PCF). Emissions from the production and delivery of equipment use general categories (e.g. technical equipment, measuring equipment, car, etc.). The delivered calculation distinguishes between the total impact of an internal combustion engine and an electric motor through fuel consumption/distance travelled in km.
Electricity consumption, fleet mileage, diesel consumption	Category 3 [Fuel and energy-related activities]	Invoices, internal records	AD	The Ecometrica tool additionally calculates Scope 3 emissions from the above activities that are classified as Scope 1 and Scope 2 GHG-emitting activities. Emissions from drinking water treatment are also included in this category.
Waste quantities produced	Category 5 [Waste generated in operations]	Waste generation reports	HM	Data on waste quantities were obtained from waste reporting. Treatment method information is obtained from waste treatment service providers. *Closed loop* recycling is indicated for mineral oil, paper and cardboard and for recycled hazardous waste. Wood waste has been transferred for energy recovery.
Flights, number of overnight stays	Category 6 [Business travel]	Internal records	HM	For overnight stays, the Ecometrica tool distinguishes between the country of the overnight stay. The emission factor for flights contains a Radiative Force Index of 1.9. A long flight represents a distance above 3,700 km, a medium flight is between 785 km and 3,700 km. A short flight represents a distance below 785 km.
Number of days spent at home office	Category 7 [Employee commuting]	Internal records	HM	For estimating emissions according to worker location, eGRID sub-regions are used. These are geographic areas defined by the US Environmental Protection Agency (EPA).
Distance travelled	Category 7 [Employee Commuting]	Employee questionnaire survey	HM	The questionnaire asked employees to select the type of drive and size of car (small, medium, and large) if they commuted in their own car. Other modes of transport included car share, public transport, motorbike, coach, train, scooter and bicycle. Commuting on foot was considered non-emitting.
Rentals of premises and facilities for the needs of NBS	Category 8 [Leased assets (upstream)]	NBS accounting records	SBM	This category includes the accounts 65013060 lease costs, 65013040 building and room rentals, and 65013050 rentals for event purposes.
Energy recovery of used banknotes	Category 12 [End-of-life treatment of sold products]	Internal records	HM	For the 2023 reporting period, the previous years' emission factor (0.12 kg CO_2e per kilogram of material) is used for energy recovery of used banknotes. We do not report negative emissions from banknotes in the current 2023 period, as no relevant life cycle analysis is available. The method of reporting negative emissions using life cycle analysis and the related methodology is part of the Action Plan.

Leasing of premises owned by NBS	Category 13 [Leased assets (downstream)]	Audit of NBS financial statements	HM	The energy intensity per m^2 of leased space was used to estimate emissions.
Management of investment reserves	Category 15 [Investments]	Climate-related disclosures NBS's non-monetary policy portfolios	Normal-ised indic-ators (WACI[32] and CF[33]) and absolute indicator (TCE)[34]	The calculation is published annually in the Climate-Related Disclosures and is not performed using the Ecometrica tool.

Clarifications on Scope 3 emissions

In Ecometrica, the activity names from the CapEx (Scope 3) and OpEx (Scope 3) sub-accounts are used in both the *Capital goods* and *Purchased goods and services* categories, corresponding to capital and operating expenditure, respectively. These sub-accounts are continuously updated and are used by several financial institutions. Since the same activity can represent either a capitalised or a non-capitalised expenditure depending on the context, an activity from the OpEx sub-account may appear under the *Capital goods* category, and similarly, an activity from the CapEx sub-account may be classified under *Purchased goods and services*.

- **Operating expenses:**
  - Issues have been estimated using the cost-based method – the method with the lowest accuracy (year-on-year comparisons of results are affected by inflation). In future years, NBS plans to replace selected categories with more accurate methods depending on the availability of data from suppliers.
  - The cost of issuance was estimated at EUR 29 million, while the total operational expenditure (including items not related to issuance) amounted to EUR 39 million. A margin of error of 0.24% was applied in the cost estimation.
  - The cost of providing fire protection in 2023 amounted to EUR 53 thousand. To estimate the emissions from the new fire extinguishers delivered, we used the Ecometrica activity *All other miscellaneous manufacturing*. After additional screening, we concluded that all existing and new fire extinguishers do not contain high GWP mixtures,[35] but contain either ABC Powder 40 or carbon dioxide.[36] Therefore, there is no need to adjust the estimate of extinguisher emissions upwards.
  - The non-included items and the reason for their non-inclusion are as follows:
    - Waste costs, energy carriers, travel costs, rent, printing of euro notes: For these activities, we had more accurate data than the cost items and the emissions from them were estimated from non-cost items.
    - Catering expenditure: There are currently no records with the exact number and type of meals.
    - Car parking: We do not consider the expenditure of €93 to be significant.
    - Accounting adjustments and transactions that could not be assigned a physical dimension were excluded from the analysis.

- **Capital expenditure:**
  - Issues were estimated using the cost-based method – the method with the lowest accuracy (the year-on-year comparison of results is affected by inflation). In future years, NBS plans to replace selected categories with more accurate methods, depending on the availability of data from suppliers.

[32] Weighted average carbon intensity.
[33] The carbon footprint normalises the TCE value by the size of the portfolio and is expressed in tonnes of CO_2e per million euros invested.
[34] Total carbon emissions measures the carbon emissions associated with the portfolio and is expressed in tonnes of CO_2e.
[35] High GWP extinguishing agents (according to IPCC 1996 (IPCC archive), time horizon 100 years): Halon 1301 (GWP 5 400), HFC-227ea (GWP 2 900). According to the Chemours product brochure, FE-36 has a GWP of 6 300.
[36] The GWP of carbon dioxide is 1 and there are approximate estimates for ABC at 1.5 kg CO_2e per kg of extinguishant.

- The CapEx of the previous periods amounts to EUR 7 million, and the CapEx increments for the 2023 reference period (increments on the acquisition side) amount to EUR 6 million. We have not worked with any deviation in the treatment of capital expenditure.
- We also include capital expenditure of an intangible nature in Category 2 [Capital Goods], as an issue factor could be traced to it.

4.4 Data quality

The Ecometrica tool evaluates the quality of the data using two types of parameters:

- 'Actual/estimated/mixed' ratings in the *Data quality overview* bar of the T*echnical information from Ecometrica* file. Estimated/mixed ratings were obtained for the following data types:
  - Attendance (data obtained from the questionnaire; based on respondents' estimates).
  - Waste data (specific waste management confirmations from the contractor were not obtained for 2023).
  - All cases where emissions were estimated using the cost method.

  In all other cases, the underlying data is assessed as *actual*.

- Expressed uncertainty indicated in the *Technical information* file for each data point; two uncertainty values are used:
  - All data are assigned a minimum uncertainty of 5% (+/-5.00%).
  - Data marked as *estimated/mixed* are assigned an uncertainty of 30% (+/-30.00%)

4.5 Method of reporting selected activities monitored in 2023

In the 2023 emissions report, a comparison of various activities is provided for the period 2017–2023. In some cases, a single activity represents a composite of multiple NAICS classifications (the sub-emissions under each classification can be viewed in Ecometrica). Table 8 presents an overview of the sub-emissions that make up each activity in the year-to-year comparison.

Table 8
Partial emissions of selected activities

Paper (method: SBM)	**tCO_2e**
Office Supplies and Stationery Stores	12.57170945
Furniture (method: SBM)	
All Other Miscellaneous Manufacturing	2.730504753
Finish Carpentry Contractors	0.02935491
Service Establishment Equipment and Supplies Merchant Wholesalers	1.410379935
Other Commercial and Industrial Machinery and Equipment Rental and Leasing	7.69552652
Office Machinery and Equipment Rental and Leasing	6.297057356
Other Commercial and Industrial Machinery and Equipment Rental and Leasing	1.030255325
Other Commercial and Industrial Machinery and Equipment Rental and Leasing	3.316511848
Total	22.50959065

IT Equipment (method: SBM)	
Communication Equipment Repair and Maintenance	3.652857282
Computer and Office Machine Repair and Maintenance	28.6560442
Computer Storage Device Manufacturing	10.08297659
Custom Computer Programming Services	80.18378748
Electrical Apparatus and Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers	2.53476722
Electronic Computer Manufacturing	31.72554136
Electronics Stores	23.14249318
Hardware Stores	3.391006341
Other Electronic and Precision Equipment Repair and Maintenance	2.392605625
Total	185.7620793
CapEx: Building Operation Equipment (method: SBM)	
Other Building Finishing Contractors	2.43199555
Service Establishment Equipment and Supplies Merchant Wholesalers	1.410379935
Electrical Apparatus and Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers	2.53476722
Other Electronic and Precision Equipment Repair and Maintenance	2.392605625
Total	8.76974833
Services – Building Maintenance (method: SBM)	
Commercial and Industrial Machinery and Equipment Repair and Maintenance	72.45120058
Stationary Sources (method: AD, DM)	
Diesel	2.49543092
Natural Gas Consumption (gross CV)	1474.323604
Total	1476.819035
Waste (method: HM)	
Waste Generated in Operations	37.929
Wastewater (Method: AD)	
Water Consumption	4.487
Transport and Distribution of Banknotes (method: DM)	
Articulated HGV (3.5-33t) Average Load (50km + 1090 km --> 0.0093+0.038+0.2+0.84)	1.085175425
Employee Business Trips (Method: HM)	
Business Travel	415.198

4.6 Methodological differences from previous periods

Scope 3 emissions in the 2023 period have increased by a factor of approximately five compared with the previous period[37] (not including emissions from non-monetary portfolios). The reasons for the jump are as follows:

- In 2023, emissions were monitored in the locations described in the introduction to the methodology. In previous periods, the calculation of emissions included some data per exposure, but not at the 2023 level of complexity. Source data for multipurpose facilities were collected for the first time in 2023.

[37] For 2023, the ECB had a ratio of Scope 3 emissions to total emissions of 89%. In the case of NBS, this ratio increased year-on-year from 35 to 75%.

- In addition to the Scope 3 emission categories used in previous periods, the following were included in the calculation in the 2023 reporting period:
  - Category 8 Leased assets (upstream)
  - Category 13 Leased assets (downstream)
  - Category 15 Investments (reported outside Scope 3 NBS as f*inanced emissions*)

- By using the cost-based method, we have significantly expanded the scope of the data included in Category 1 Purchased goods and services and Category 2 Capital goods. In 2023, more than 85 NAICS[38] activities with a total value of 43.8 million were included in these categories. By comparison, no more than seven activities were classified in Categories 1 and 2 between 2017 and 2022.

- In addition, we estimated emissions from overnight stays in hotels in 2023.

- Chart 2 shows a comparison of the reported categories from 2017 to 2022 with 2023:
  1. Direct emissions: Fugitive GHG emissions.
  2. Direct emissions: GHG emissions from stationary sources.
  3. Direct emissions: GHG emissions from mobile sources.
  4. Indirect emissions: GHG emissions from the production of purchased power.
  5. Indirect emissions: GHG emissions related to the management of waste and wastewater generated.
  6. Indirect emissions: GHG emissions related to fuels and energy not already included in SCOPE 1 and SCOPE 2 (Scope 3 diesel + electricity consumption).
  7. Indirect emissions: GHG emissions related to purchased goods and services, including the purchase of fixed assets (excluding the activity of other NBS activities).
  8. Indirect emissions: GHG emissions related to business travel.
  9. Indirect emissions: GHG emissions related to the transport and distribution of purchased goods and services.

- In point 1, the deviations are due to the existence of years where zero leakages and refills of refrigerants were reported. Item 7 integrates paper and building maintenance activities – these two activities could also be expressed for 2023. The remaining activities (other-NBS activities and building operations) are not included in the 2023 data. In addition, the activity of overnight stays in hotels is included in the 2023 data under point 8.

- The following three activities that were not originally reported or were reported differently in 2017–2022 are newly included:
  - Not originally reported: Indirect emissions – GHG emissions from mobile sources (direct + indirect = well-to-tank emissions)
  - Well-to-tank also includes upstream emissions; in 2023, these emissions are already included in total mobile source emissions.

- Originally reported as a linked activity for employee commuting:
  - The employee commuting category for 2023 is based on identical data as in 2022. However, by changing the methodological approach, the emissions from this category are not identical, but are at the following levels:
    - Employee commuting 2023: 450 tCO_2e
    - Employee commuting 2022: 458 tCO_2e
  - The different emissions from this category in 2022 and 2023 are due to the following methodological differences:
    - Homeworking category: in 2022, the average electricity consumption during an eight-hour working day was estimated at 1.7 kWh. In 2023,

[38] North American Industry Classification System

this consumption is estimated at 1.2 kWh in the Ecometrica homeworker methodology document.

- Ecometrica uses other sources of emission factors for employees' commuting by different modes of transport. The sources of emission factors used by Ecometrica can be found in the annex 'Technical information' in the *Emissions factors* bar. The sources of emission factors used in the 2022 report are available in the 2017–2022 NBS report, starting on page 120. For instance, in 2022, an emission factor of 196.24 gCO_2/km was used for diesel vehicles above 110 kW. In 2023, the category *Car, diesel, large* was used with a factor of 206.91 gCO_2/km.
- Bicycle/Pedestrian/Scooter commuting: in 2022, non-zero emission factors were used for these categories; in 2023, zero emission factors were used.

When comparing past years' results with 2023, we did not observe any variations that were not explained by a change in methodological approach or a change in the source consumption data.

5 Appendices[39]

Appendix I Technical information from the Ecometrica tool

Appendix II Spend-based method

Appendix III Ecometrica homeworker methodology

Appendix IV Methodology for avoided GHG emissions calculation

[39] All appendices and technical information from the Ecometrica tool are available upon request in justified cases.