Greenhouse Gas Emissions of BNG's assets

Reporting year 2025

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Management summary

The Paris Climate Agreement, signed in 2015, set the goal of limiting global warming to less than two degrees Celsius above pre-industrial levels. The aim is to keep warming limited to one and a half degrees. Subsequently, the Netherlands set a specific target in the 2019 National Dutch Climate Agreement: to reduce greenhouse gas (GHG) emissions by 55% by 2030, compared to 1990 levels. The Netherlands aims to be carbon neutral by 2050.[1] Much remains to be done to make the transition to a low-carbon society. While many organisations are taking action, many others are still lagging behind.

Since the 2015 Paris Climate Conference, the banking sector has been actively engaged in helping to realise the ambitions of the Paris Agreement. Given the magnitude of the climate challenge and the critical role of the banking and financial sector in enabling the transition to net-zero carbon emissions, the Partnership for Carbon Accounting Financials (PCAF) was established.

BNG committed itself to PCAF in 2019. Using the PCAF methodology, the GHG emissions of BNG's loan portfolio have been calculated and disclosed in BNG's annual report from 2019 onwards.[2] The loan portfolio includes the following market segments: social housing sector, public sector, healthcare, education, public infrastructure, 'others' and energy. Identifying ways to improve the methodology, for example by using better data sources, is part of the PCAF project for BNG. These improvements can be seen as a contribution made by BNG to the further development of the PCAF methodology.

In this report, the summary tables include the results of the loan portfolio for the years 2018, 2023, and 2024 and the results of the bonds and medium-term notes for the years 2023 and 2024. The results are always one year behind due to data availability; therefore, the 2024 results are the most recent. Calculating and presenting GHG emissions over a period of time allows the bank to monitor the evolution of GHG emissions over time.

This report describes the methodology and results of the GHG emissions assessment of BNG's loan portfolio and bonds and medium-term notes for the year 2024. The climate impact has been (re)calculated in accordance with the latest available harmonised approach for the financial sector in the Netherlands[3] and the global GHG accounting & reporting standard.[4]

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[1] Rijksoverheid (n.d.). Klimaatverandering beperken (Dutch website).

[2] BNG (n.d.). Annual reports.

[3] Accounting GHG emissions and taking action: harmonised approach for the financial sector in the Netherlands PCAF The Netherlands, report 2019

[4] PCAF (2022). The Global GHG Accounting and Reporting Standard Part A: Financed Emissions. Second edition.

First, the results of the loan portfolio are discussed. As shown in Table S-1, 99.7% of BNG's loan portfolio is covered in this GHG emissions report. The coverage ratio increased by 0.1%point (%pt) compared to 2023. This increase in coverage ratio is due to an improved coverage ratio within the sectors educational institutions, drinking water companies and renewable energy. Increasing the coverage ratio continues to be a challenge, and although the calculated GHG footprint is now more complete, improving data quality remains an ongoing objective for the coming years. Although the coverage ratio for 2024 is 99.7%, not all sectors in Table S-2 include scope 1, 2 and 3 emissions. Where scope 3 emissions are included, they are not always fully captured, as is the case for the healthcare sector.

Table S-1 Total outstanding loans of BNG and part covered in the GHG assessment for the years 2018, 2023 and 2024[5]. – means no data are available

Market segment	Sector	Total loan portfolio (million euro)			Coverage ratio by GHG footprint of total loan portfolio (%)		
		2018	2023^	2024	2018	2023	2024
Housing	Social housing associations	38,947	45,957	50,013	94.0	100.0	100.0
	Housing related	496	784	884	-	100.0	100.0
Public sector	Municipalities	26,066	25,104	24,993	99.8	100.0	100.0
	Provinces	137	449	584	100.0	100.0	100.0
	Water boards	233	220	237	100.0	100.0	100.0
	Joint arrangements	1,362	1,303	1,290	-	100.0	100.0
	Other public institutions	768	510	493	-	100.0	100.0
Healthcare	Healthcare	7,031	6,629	6,329	87.7	100.0	99.7
Education	Educational institutions	979	1,035	1,002	55.9	100.0	100.0
Public infrastructure	Public transport	909	1,153	1,409	-	100.0	100.0
	Infrastructure	1,220	1,056	934	72.6	100.0	100.0
	Waste collection and processing	754	697	756	-	100.0	100.0
	Drinking water companies[#]	811	677	933	-	92.2	99.0
	Spatial planning	754	592	513	-	100.0	100.0
	Network operators (energy, telecom)	451	486	319	-	100.0	100.0
Others	Others	381	253	239	-	100.0	100.0
Energy	Wind and solar energy	255	690	647	-	77.2	82.3
	Biomass and geothermal	54	118	76	-	-	-
	Sustainability projects	19	52	49	-	-	-
Total	**All sectors**	**81,629***	**87,765***	**91,702***	**86.5**	**99.6**	**99.7**

[5] Reference date for the year 2024 is 31-12-2024, reference date for the year 2023 is 31-12-2023, and reference date for the year 2018 is 31-12-2018.

^ The current report does not include data for 2019, 2020, 2021 and 2022. It is decided to calculate 3 years: The reference year (2018) and the two most recent years, 2023 and 2024.

For drinking water companies, the reference year is not 2018, but 2020. Sector specific data are presented in chapter 16.

* Due to rounding, the figures and sums in these columns may not correspond exactly to the numbers presented in the report.

Table S-2 shows that for 99.7% of BNG's loan portfolio, the total financed GHG emissions are 2,363,094 tCO_2e, the relative financed GHG emissions are 26.0 tCO_2e per million euro and the overall data quality score is 2.7 on a scale of 1 (best) to 5 (poor). Both the total absolute and financed emissions decreased between 2023 and 2024. A direct comparison with 2018 is not possible due to the overall increase in the coverage ratio. Between 2023 and 2024, the total financed emissions decreased by 53,490 tCO_2e. The relative financed GHG emissions decreased from 27.8 tCO_2e/million euro to 26.0 tCO_2e/ million euro (Table S-2).

BNG has set targets under its climate action plan for the sectors social housing, municipalities, healthcare and education. When examining scope 1 and 2 emissions for these sectors in relation to the surface shows that for both the social housing and municipalities sectors, financed GHG emissions per financed square metre increased between 2023 and 2024. A year-on-year comparison for the healthcare sector cannot be made due to methodological changes. Within the four sectors, social housing exhibits the lowest financed GHG emissions per financed square metre (22.1 $kgCO_2e/m^2$; 2024), while healthcare institutions show the highest (46.1 $kgCO_2e/m^2$; 2024).

The sectors with the highest relative financed GHG emissions are waste collection and processing, infrastructure, network operators (energy, telecom) and spatial planning. Together, these sectors cover just 2.8% of BNG's loan portfolio, but the financed GHG emissions are 25.2% compared to the total emission.

BNG also finances renewable energy projects such as wind- and solar parks. These projects displace emissions that would otherwise have occurred without these projects. The net avoided emissions of these projects demonstrate a quantifiable positive contribution to decarbonisation. Financed avoided emissions are reported separately in Chapter 20. Net financed avoided GHG emissions were calculated for 73.6% of BNG's clients in the renewable energy sector.

Table S-2 Absolute and relative financed GHG emissions for the years 2018, 2023 and 2024. - indicates data are not available.

Market segment	Sector	Scopes	Loans of clients for which a GHG footprint was calculated (million euro)			Financed GHG emissions (ktCO2e)			Relative financed GHG emissions (tCO2e/million euro)			Data quality*
			2018	2023^	2024	2018	2023	2024	2018	2023	2024	2024
Housing	Social housing associations*	1-2	36,617	45,957	50,013	635	459	522	17.3	10.0	10.4	2.0
	Housing related	1-2-3	-	784	884	-	5	6	-	6.9	6.3	5.0
Public sector	Municipalities*&	1-2-3	26,006	25,104	24,993	1002	842	835	38.5	33.6	33.4	3.8
	Provinces	1-2-3	137	449	584	9	13	19	63.6	27.9	33.1	4.0
	Water boards	1-2-3	233	220	237	34	14	16	144.4	64.6	66.2	2.8
	Joint arrangements	1-2-3	-	1,303	1,290	-	86	80	-	66.1	62.0	5.0
	Other public institutions	1-2-3	-	510	493	-	32	30	-	62.7	61.5	5.0
Healthcare	Healthcare*^^	1-2-3	6,167	6,629	6,310	285	200	145	46.3	30.2	23.0	2.6
Education	Educational institutions*&	1-2	547	1,035	1,002	13	14	13	24.4	13.7	12.9	3.4
Public infra-structure	Public transport	1-2-3	-	1,153	1,409	-	46	64	-	40.0	45.3	3.6
	Infrastructure+	1-2-3	885	1,056	934	14	269	212	15.8	255.0	227.2	3.8
	Waste collection and processing	1-2-3	-	697	756	-	270	264	-	387.3	349.3	2.6
	Drinking water companies	1-2-3	-	624	923	-	22	35	-	34.8	37.5	2.3
	Spatial planning	1-2-3	-	592	513	-	66	61	-	112.2	118.8	5.0
	Network operators (energy, telecom)	1-2-3	-	486	319	-	74	59	-	152.7	185.6	4.0
Others	Others	1-2-3	-	253	239	-	3	2	-	10.9	10.2	4.4
Total	**All Sectors**	**1-2-3**	**70,593**	**86,856**	**90,900**	**1,992**	**2,417**	**2,363**	**28.2**	**27.8**	**26.0**	**2.7**
Energy	Renewable energy#	3	-	533	533	-	-	-	-	-	-	-

^ In current report, data of the years 2019, 2020, 2021 and 2022 are not included. It is decided to calculate 3 years: the reference year (2018) and the two most recent years, 2023 and 2024 current report.

* Weighted average data quality score. More details about the data quality score can be found in the sections Data Quality Estimate of every sector.

Net avoided emissions have been calculated for wind- and solar parks but are not included in this table because generated and avoided emissions may not be added together.

[&] For the calculation of emissions for 2024 for the municipalities and education sectors, changes in methodology and/or the use of improved data sources have been applied. To ensure consistency, comparability and relevance of reported GHG emissions over time, the comparative figures for 2023 and 2018 have been adjusted accordingly, where possible. See Chapter 2.5 for further details.

[^^] For the calculation of emissions for 2024 for the healthcare sector, changes in methodology and/or the use of improved data sources have been applied. As it was impossible to adjust the figures for 2023 and 2018, direct comparisons over time are not possible for the healthcare sector. See Chapter 11.2.1 for further details.

[+] The outstanding loan amount and the related emissions of one client have been reclassified from 'others' to the 'infrastructure' sector to better reflect the nature of the business activities. The comparative figures for 2023 have been adjusted accordingly.

Table S-3 Net avoided financed GHG emissions for the energy portfolio in 2023 and 2024

Year	Loans of clients for which a GHG footprint was calculated (million euro)	Net avoided financed GHG emissions (tCO_2e)	Relative net avoided financed GHG emissions (tCO_2e/million euro)	Data quality*
2023	533	380,410	714.3	3.0
2024	533	366,174	687.2	3.0

*Weighted average data quality score. More details about the data quality score can be found in section 2.3. This table only includes financed net avoided emissions of renewable energy projects and does not include avoided emissions from housing associations and drinking water companies (see Table 21-5 in chapter 21), as only gross financed avoided emissions are known for the housing associations and drinking water companies.

In addition to the calculated GHG footprint of BNG's loan portfolio, this report also includes the calculated GHG footprint of the bonds and medium-term notes. BNG holds debt securities of sovereigns, supranationals and multilateral development banks, municipalities, corporates, others and structured bonds and medium-term notes. Table S-4 shows the outstanding amounts and coverage ratio of the calculated GHG footprint by the type of bonds and medium-term notes. For all bonds and medium-term notes, except structured bonds and medium-term notes, the outstanding amounts increased between 2023 and 2024 (Table S-4 and S-6). The coverage ratio is 61.7% for 2024 (Table S-4). The total outstanding amounts for these bonds and medium-term notes with a calculated GHG footprint increased by 3,800 million euro.

Table S-4 Total outstanding value and coverage ratio of the bonds and medium-term notes in the GHG assessment for the years 2023 and 2024*

Type of bonds and medium-term notes	Total outstanding value (million euro)		Coverage ratio by GHG footprint of total bonds and medium-term notes (%)	
	2023	2024	2023	2024
Issued by municipalities	1,247	1,286	99.9	100.0
Issued by corporates	1,572	1,975	27.7	100.0
Structured bonds and medium-term notes	7,483	6,652	0.0	0.0
Other	791	1,260	0.0	0.0
Total excl. sovereigns	**11,093**	**11,173**	**15.2**	**29.2**
Issued by sovereigns, supranationals and multilateral development banks	9,270	10,781	87.1	95.5
Total incl. sovereigns	**20,363**	**21,954**	**47.9**	**61.7**

* Reference date for the year 2024 is 31-12-2024 and reference date for the year 2023 is 31-12-2023.

As shown in tables S-5a, the total financed GHG emissions for the bonds and medium-term notes issued by sovereigns, supranationals and multilateral development banks are 1,900,587 tCO_2e, the relative financed GHG emissions are 184.6 tCO_2e per million euro excluding Land Use, Land Use Change and Forestry (LULUCF) and the overall data quality score is 3.3 on a scale of 1 (best) to 5 (poor).

The total financed GHG emissions for these bonds and medium-term notes increased by 10,629 tCO_2e (excl. LULUCF) between 2023 and 2024. The total relative financed GHG emissions, both excluding and including LULUCF decreased by 49.5 tCO_2e per million euro and 31.5 tCO_2e per million euro, respectively (Table S-5a and S-5b). This shows that GHG emissions per million euro have reduced. These bonds and medium-term notes are relatively CO_2 intensive (relatively high CO_2e per million euros). It will be interesting to see if this will be reduced in the coming years.

Table S-5a Absolute and relative financed GHG emissions for bonds and medium-term notes issued by sovereigns, supranationals and multilateral development banks (MDB) in the years 2023 and 2024 excl. LULUCF. - means no data are available

Type of bonds and medium-term notes	Scopes	Bonds and medium-term notes for which a GHG footprint was calculated (million euro)		Financed GHG emissions (tCO2e)		Relative financed GHG emissions (tCO2e/ million euro)		Data quality *
		2023	2024	2023	2024	2023	2024	2024
Issued by sovereigns, supranationals and Multilateral Development Banks (MDB) excl. LULUCF**	1	-	-	1,303,109	1,240,537	161.4	120.5	3.0
Issued by sovereigns, supranationals and Multilateral Development Banks (MDB)	2	-	-	16,860	14,695	2.1	1.4	4.0
Issued by sovereigns, supranationals and Multilateral Development Banks (MDB)	3	-	-	569,989	645,354	70.6	62.7	4.0
Total excl. LULUCF	**1-2-3**	**8,074**	**10,294**	**1,889,958**	**1,900,587**	**234.1**	**184.6**	**3.3**

*Weighted average data quality score. More details about the data quality score can be found in Chapter 22.

**LULUCF is Land Use, Land Use Change and Forestry. LULUCF is the only sector where net removal of CO2 from the atmosphere is possible through carbon sequestration in biomass (wood, plants) and soil. GHG emissions including LULUCF are lower than those excluding LULUCF.

Table S-5b Absolute and relative financed GHG emissions for bonds and medium-term notes issued by sovereigns, supranationals and multilateral development banks (MDB) in the years 2023 and 2024 incl. LULUCF. - means no data are available

Type of bonds and medium-term notes	Scopes	Bonds and medium-term notes for which a GHG footprint was calculated (million euro)		Financed GHG emissions (tCO2e)		Relative financed GHG emissions (tCO2e/ million euro)		Data quality *
		2023	2024	2023	2024	2023	2024	2024
Issued by sovereigns, supranationals and Multilateral Development Banks (MDB) incl. LULUCF**	1	-	-	1,216,840	3.0	150.7	127.7	3.0
Issued by sovereigns, supranationals and Multilateral Development Banks (MDB)	2	-	-	16,860	4.0	2.1	1.4	4.0
Issued by sovereigns, supranationals and Multilateral Development Banks (MDB)	3	-	-	569,989	4.0	70.6	62.7	4.0
Total incl. LULUCF	**1-2-3**	**8,074**	**10,294**	**1,803,689**	**3.3**	**223.4**	**191.9**	**3.3**

*LULUCF is Land Use, Land Use Change and Forestry. LULUCF is the only sector where net removal of CO2 from the atmosphere is possible through carbon sequestration in biomass (wood, plants) and soil. GHG emissions including LULUCF are lower than those excluding LULUCF.

The total financed GHG emissions for the bonds and medium-term notes issued by municipalities and corporates are 337,198 tCO_2e, the relative financed GHG emissions are 103.4 tCO_2e per million euro and the overall data quality score is 1.8 on a scale of 1 (best) to 5 (poor). The total financed GHG emissions increased by 196,823 tCO_2e between 2023 and 2024 (Table S-6). The total relative financed GHG emissions also increased by 19.9 tCO_2e per million euro (Table S-6). This shows that GHG emissions per million euro have increased.

Table S-6 Absolute and relative financed GHG emissions for bonds and medium-term notes issued by municipalities, issued by corporates, structured bonds and medium-term notes and others for 2023 and 2024. - means no data are available

Type of bonds and medium-term notes	Scopes	Bonds and medium-term notes for which a GHG footprint was calculated (million euro)		Financed GHG emissions (tCO2e)		Relative financed GHG emissions (tCO2e/million euro)		Data quality*
		2023	2024	2023	2024	2023	2024	2024
Issued by municipalities	1-2-3	1,246	1,286	29,974	27,717	24.1	21.6	3.9
Issued by corporates	1-2-3	436	1,975	110,401	309,481	253.2	156.7	1.7
Structured bonds and medium-term notes (mtn)	1-2-3	-	-	-	-	-	-	-
Other	1-2-3	-	-	-	-	-	-	-
Total	**1-2-3**	**1,682**	**3,261**	**140,375**	**337,198**	**83.5**	**103.4**	**1.8**

*Weighted average data quality score. More details about the data quality score can be found in Chapter 22.
#Reference date for the year 2024 is 31-12-2024 and reference date for the year 2023 is 31-12-2023.

External factors will always have an impact on GHG emissions. In the last five years, events such as the global pandemic and the conflicts around the world have affected energy prices, energy consumption and travel patterns. Changes in weather conditions, especially in winter, also have an impact on GHG emissions, as colder temperatures often lead to increased heating demand and higher energy consumption. The energy consumption of social housing associations, municipalities, healthcare, and education institutions has been adjusted for weather conditions. In other sectors, however, the figures are not corrected. For instance, rainfall affects the energy use of water boards, as wetter conditions increase the amount of water that must be treated and pumped, leading to higher energy demand. Long-term monitoring of the GHG footprint of BNG's loan portfolio will reveal whether the reduction is temporary (e.g. due to external factors) or whether it is a long-term positive development resulting from structural changes in behaviour or investments in sustainable energy sources and/or investments in more sustainable real estate.

This year, 99.7% of BNG's loan portfolio is included in the calculated GHG footprint. Now that the coverage ratio is close to 100%, the focus in the coming years will be more on improving data quality and completing scope 3.

Index

1 Introduction

The Paris Climate Agreement, signed in 2015, set the goal of limiting global warming to less than two degrees Celsius above pre-industrial levels. The aim is to limit warming to one and a half degrees. Subsequently, the Netherlands set a specific target in the 2019 National Dutch Climate Agreement: to reduce greenhouse gas (GHG) emissions by 55% by 2030, compared to 1990 levels. The Netherlands aims to be carbon neutral in 2050.[6]

Achieving these targets requires a fundamental transition to a new energy system. An increasing share of electricity is already being generated from renewable sources such as wind and solar, complemented by geothermal energy, hydrogen and biogas. However, the transition to renewable energy alone is not sufficient. Improving energy efficiency and reducing overall energy consumption are equally important pillars of climate policy, as also emphasised in the Paris Climate Agreement. Energy savings contribute directly to lowering emissions, reducing pressure on natural resources and limiting environmental impacts associated with the production of renewable technologies, such as wind turbines, solar panels and batteries, which often rely on scarce materials and resource-intensive processes.

At the same time, electricity demand is expected to rise in the near future due to the electrification of transport, the shift of industry away from fossil fuels, and the transition of buildings to district heating or electric heating systems. This makes energy efficiency even more critical. Although many organisations are actively working towards these goals, substantial efforts are still required to complete the transition to a low-carbon society, as a significant number of actors continue to lag behind.

Since the 2015 Paris Climate Conference, the Dutch financial sector has been involved in contributing to the realisation of the ambitions of the Paris Agreement. Banks play a crucial role in realising these ambitions. This is not only because they represent the majority of the world's available capital, but also because the largest banks have still invested almost $4.6 trillion in the fossil fuel sector since the Paris Climate Agreement in 2015. This is equivalent to $1.8 billion every day since the end of 2015, with no downward trend or assessment of the carbon impact of this funding.[7]

In 2019, 54 financial institutions signed the Climate Commitment. These banks, insurers, pension funds and asset managers agreed on how they ,will actively contribute to the Paris Climate Agreement and the Dutch Climate Agreement as the

[6] Rijksoverheid (n.d.). Klimaatverandering beperken (Dutch website).

[7] PCAF (n.d.) About PCAF.

financial sector.[8] The participating institutions agreed to take four actions: to participate in financing the energy transition, to measure the GHG emissions of their relevant financing and investments, to prepare action plans including GHG emission reduction targets, and to organise consultations with relevant stakeholders on the progress of the GHG emission reductions.

1.1 A Partnership for Carbon Accounting Financials: PCAF

PCAF is a global partnership of financial institutions that work together to develop and implement a harmonised approach to assessing and disclosing the GHG emissions associated with their loans and investments.[9] In 2015, the Dutch Carbon Pledge started with eleven institutions under the leadership of ASN Bank. These financial institutions wanted to take responsibility and take new and meaningful steps to help keep global warming below safe levels. Since then, more financial institutions have joined forces under PCAF to develop and implement open-source methodologies to measure the GHG emissions of all asset classes within their loan and investment portfolios.[10] In 2019, BNG formally committed to the PCAF initiative.

Based on the GHG accounting activities in the Netherlands and North America, ABN AMRO, Amalgamated Bank, ASN Bank, Global Alliance for Banking on Values (GABV), and Triodos Bank launched a global initiative to develop a global GHG accounting standard and increase the number of financial institutions applying this standard to over 250 institutions worldwide. This will ultimately make GHG accounting common practice in the financial industry and facilitating the transition in line with the Paris Climate Agreement.[11]

In November 2025, 674 financial institutions have committed to measure and disclose the GHG emissions associated with their portfolio of loans and investments, representing a total financial asset of $ 97.6 trillion.[12]

All of these financial institutions have found it valuable to assess and disclose the GHG emissions of their loans and investments, as this stimulates an institution-

[8] Klimaatakkoord (2019). Commitment van de financiële sector (Dutch article).

[9] PCAF (n.d.) About PCAF.

[10] Ibid.

[11] Ibid.

[12] PCAF (n.d.). Financial institutions taking action.

wide discussion about climate change and the role of the financial institutions in facilitating the transition to reach net zero emissions by 2050.

1.2 BNG and PCAF

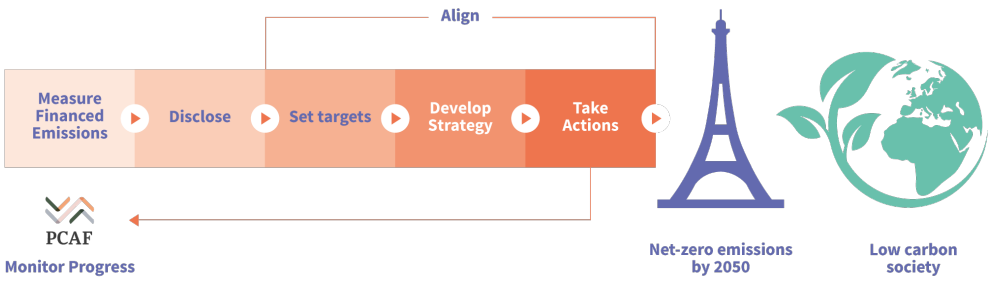
In 2018, in preparation for joining the PCAF initiative, BNG asked Telos[13] to measure the GHG emissions related to the BNG's public loan portfolio, using the PCAF methodology. The first GHG emissions report covered the year 2018. Since then, the GHG emissions have been reported annually and disclosed in BNG's annual report.[14] Each year, BNG reports on the reference year (2018) as well as the two most recent consecutive years.

For this report, the GHG footprint was calculated for BNG's loan, bond and medium-term notes portfolio.

1.3 From GHG footprint to action

Measuring and disclosing the GHG emissions associated with the financial institutions' lending and investment activities is necessary for transparency and accountability. But PCAF is not only about measuring and disclosing the GHG emissions of a financial institution's portfolio. It is also about identifying and setting targets for reducing the carbon footprint and taking action (Figure 1).

Figure 1. Visualisation from GHG footprint to action



[13] At that time Telos was an independent research institute, based at Tilburg University. In January 2020 Het PON and Telos have merged into one organisation called Het PON & Telos. At the same moment this new institute, Het PON & Telos, became official partner of Tilburg University.

[14] https://www.bngbank.nl/over-BNG-Bank/Kerncijfers-en-jaarverslagen BNG (n.d.). Annual reports.

BNG has published its **climate action plan** in 2022. This plan sets out the BNG's strategy to reduce GHG emissions in the sectors social housing, municipalities, healthcare and education. In its annual progress report, BNG tracks its progress on its targets.

1.4 Reading guide

This report describes the methodology and results of the GHG emissions assessment of BNG's loan, bond and medium-term notes portfolio.

Chapter 2 describes the PCAF methodology in general. In chapter 3, the loan portfolio of BNG is presented. Chapters 4 to 20 describe the results of the coverage ratio, absolute and relative financed GHG emissions, and a description of the methodology for the sectors that are part of BNG's loan portfolio.

The following market segments of the loan portfolio are included in this report:

- Housing: Social housing sector and Housing related
- Public sector: Municipalities, Provinces and Water boards, Joint Arrangements and other public institutions
- Healthcare sector
- Educational institutions
- Public infrastructure: Public transport, Infrastructure, Waste collection and processing, Drinking water companies, Spatial planning and Network operators (energy and telecom)
- Sector 'others'
- Energy: Renewable energy and sustainability projects.

Chapter 21 summarises the results for all sectors of the loan portfolio.

Chapter 22 summarises the results for the bonds and medium-term notes. The following bonds and medium-term notes are part of the calculated GHG footprint:

- Issued by sovereigns
- Issued by supranationals and multilateral development banks
- Issued by municipalities
- Issued by corporates
- Structured bonds and medium-term notes
- Others

Compared to last year, the methodology has been further improved for the following sectors:

- Municipalities
- Educational institutions
- Healthcare sector

The details of the reasoning behind and the justification for the methodological improvements in the above-mentioned sectors are discussed in the individual chapters. If the financed GHG emissions are recalculated for 2018 and 2023, the files for these years are also included in the calculation sheets per chapter. However, if only 2024 is calculated, only that year is included in the calculation sheets per chapter.

This report presents the GHG emissions of the loan portfolio for 2018 (reference year), 2023 and 2024. In the management summary and in chapter 21, the loan portfolio, the coverage ratio, and financed GHG emissions are presented for the years 2018, 2023, and 2024. This enables the Bank to monitor the development of GHG emissions over time. For each year, the reference date of the loan portfolio was the end of the year. GHG emissions were calculated using the most recent available data, which for 2024 are from either 2023 or 2024. Where data from 2023 are used, this is explained in the relevant chapter.

This report also presents GHG emissions of the bonds and medium-term notes for 2023 and 2024. In the management summary and in chapter 22, the bonds and medium-term notes portfolio, the coverage ratio, and financed GHG emissions are presented for the years 2023 and 2024.

Please note that due to rounded values in tables, small differences between values mentioned in the text and values in the table can be expected.

2 PCAF methodology

The methodology used in the current study, is based on several reporting standards: *The Greenhouse Gas Protocol (A corporate accounting and reporting standard, revised edition)*[15] *, The harmonized approach for the financial sector in the Netherlands*[16] *and The global GHG accounting & reporting standard*.[17] The overall reporting requirements and recommendations are as follows:

- Principles: GHG accounting and reporting by financial institutions shall be based on the following principles: relevance, completeness, consistency, transparency, and accuracy.
- Purpose: A financial institution's reporting should be aligned with its specific business objectives; for instance, to identify and manage climate-related transition risks or to achieve a specific emissions reduction target.
- Frequency: Financial institutions shall disclose information at least annually and at a fixed point in time in line with the financial accounting cycle. They shall ensure that this point in time provides a representative view of emissions for the reporting year and transparently disclose any major changes close to (before or after) the reporting date that have affected the results.
- Recalculation and significance thresholds: In accordance with the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard, financial institutions shall establish a baseline recalculation policy to define under which circumstances a recalculating of (reference year) financed emissions is necessary to ensure the consistency, comparability, and relevance of the reported GHG emission data over time. As part of this reference year emissions recalculation policy, financial institutions shall establish and disclose the significance threshold that triggers reference year emissions recalculations.
- Form of reporting: Financial institutions shall disclose information in publicly available reports such as (semi) annual reports, website articles, or other publicly available sources as deemed appropriate by the financial institution.

[15] GHG Protocol: A Corporate Accounting and Reporting Standard – Revised Edition (2004).

[16] PCAF (2022). The Global GHG Accounting and Reporting Standard Part A: Financed Emissions. Second edition.

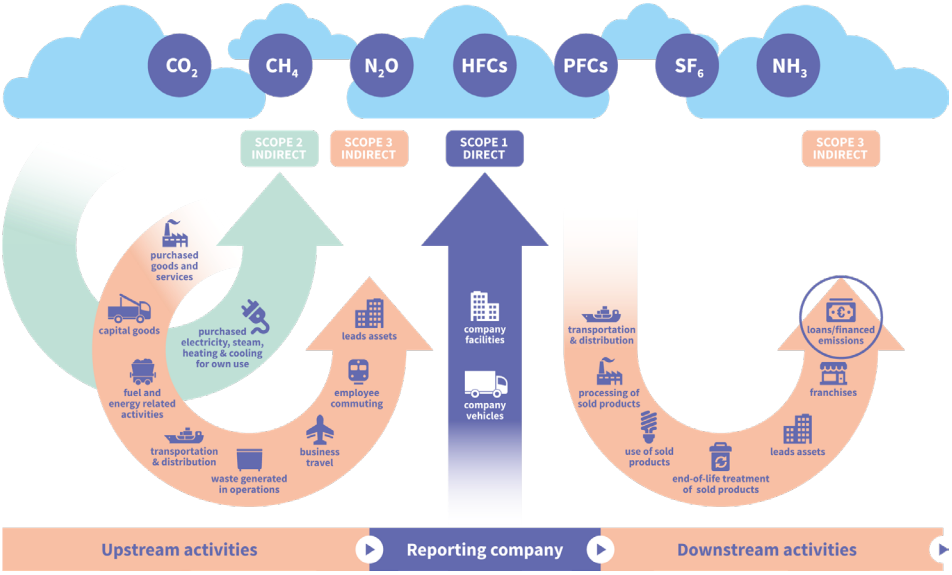
[17] Ibid.

- Past performance: Where appropriate and relevant to their business objectives, financial institutions should disclose their financed emissions for multiple comparable time periods, e.g., years.

2.1 Scopes

The GHG Protocol is the most widely used GHG accounting standard. The GHG Protocol defines three different scopes that all entities can report on separately (see Figure 2). As shown in Figure 2, GHG emissions include CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6. In the current report these scopes are defined from the perspective of the reporting financial institution such as BNG and focus on all the direct and indirect GHG emissions for which BNG is responsible for financing different types of organisations. Emissions resulting from a reporting company's loans and investments fall under Scope 3 downstream emissions (see blue circle in Figure 2). In the PCAF methodology, scopes 1, 2 and 3 refer to the scope from the perspective of the investee, project, company or government.

Figure 2. The scope definitions from the GHG protocol (Image created from GHG protocol)



According to the GHG Protocol Corporate Value Chain Accounting and Reporting Standard, a financial institution's GHG footprint should include:

- Scope 1: All direct GHG emissions that occur from sources owned or controlled by the reporting company, such as natural gas use and fuel for company cars of the investee, project, company or government.
- Scope 2: Indirect emissions from the generation of purchased or acquired electricity, steam, heating, or cooling consumed by the investee, project, company or government. Scope 2 emissions physically occur at the facility where the electricity, steam, heat, or cooling is generated.
- Scope 3 covers all other indirect emissions (not included in Scope 2) that occur in the value chain of the investee, project, company or government. Scope 3 can be divided into upstream emissions that occur in the supply chain (for example, from production or extraction of purchased materials) and downstream emissions that occur because of the use of the organisation's products or services.

Disclosure of total generated emission data are mandatory for scopes 1 and 2. Disclosure of emission intensity data (tCO_2e per million euro) for scope 1 and 2 is voluntary. For scope 3 emissions, disclosure of total generated emission data are mandatory if relevant and available (i.e., recommended by the methodology). Disclosure of scope 3 emission intensity data (tCO_2e per million euro) is voluntary. If this data are not provided, institutions should explain why they are unable to provide it.

Scope 2 and scope 3 location-based and market-based emissions

Scope 2 and some scope 3 emissions can be calculated in two ways: location-based or market-based. Location-based emissions refer to what the company physically consumes at its sites. This method is based only on the average emission intensity of the local energy grid from which the electricity originates. It does not consider any sustainable energy purchase contracts that the company might have. The way to reduce the emissions using the location-based method is to use less energy or to use more energy directly from your own solar panels, for example.

Unlike the location-based method, the calculation of market-based emissions focuses on the individual company and its contractual arrangements in the market. Market-based emissions are associated with the energy a company buys, which is different from the energy generated by the local grid.

The location-based method shows what the company physically puts into the air, while the market-based method shows the emissions a company is responsible for through its purchasing decisions.

The method used in this report depends on the availability of data. For the social housing sector, municipalities, provinces, healthcare and education, the location-based emissions are calculated because for these sectors it is not known what type of energy contracts the clients have.

For water boards and drinking water companies, however, it is largely known what type of energy contracts the companies have. For these sectors, market-based emissions are calculated. According to the method recommended by CO2emissiefactoren.nl, a distinction is made in the calculation between sustainable energy sources from the Netherlands (emission for sustainable energy source used) and sustainable energy sources outside the Netherlands (grey electricity emission factor used).

2.2 Attribution

The GHG footprint of BNG's loan portfolio and bonds and medium-term notes issued to municipalities and public infrastructure was calculated using the attribution approach. The attributed GHG emissions are calculated by using the following formula:

$$\sum \boldsymbol{CO_2eq} \times \frac{\boldsymbol{Outstanding\ loan\ volume}}{\boldsymbol{Total\ balance\ sheet\ (equity + debt)}}$$

The GHG emissions from all individual organisations are added together at sector level to calculate the total emissions in CO_2 equivalent per sector. Together, all sectors together account for the total CO_2 equivalent emissions of BNG's loan portfolio.

When interpreting the results in this report, it is important to note that due to the methodology used (especially for smaller sectors), changes in the ratio of outstanding loan volume to total balance sheet between years will affect the change in GHG emissions attributable to the bank (financed GHG emissions).

Therefore, an increase or decrease in the absolute GHG emissions between years may be the result of a change in the ratio of outstanding loan volume to total balance sheet rather than, for example, structural changes in energy consumption at sector level. The total balance sheet has an impact on both absolute and relative GHG emissions. If the ratio of outstanding loan volume to total balance sheet affects the financed GHG emissions this is indicated in the results section.

2.3 Data quality

An important element of carbon accounting is ensuring the quality of emission data attributed to loans and investments. Different asset classes present unique challenges and opportunities with respect to emission data. This section outlines some overarching principles regarding the quality and preferred hierarchy of emission data.

High quality emission data are defined as follows:

- Emission data are consistent, both across entities and over time
- Emission data reflect the underlying emissions generating activities of the entity and are not influenced by unrelated factors
- Emission data are accompanied by a relevant level of assurance.

It is possible that emission data may not meet all the criteria listed above. This depends on the specific characteristics of the loan or investment and the best practice in the sector or market. In order to comply with the PCAF reporting guidelines, participating institutions are asked to publish the existing PCAF hierarchy in accordance with Table 2-1. This table provides guidance on the disclosure of data quality scores overall and per asset class. In addition, the PCAF (2022) report provides a more detailed table presented by asset class, which can be used to determine the data quality by sector.[18] These asset class tables are used as a reference for this report.

The data quality presented in each chapter refers to the data quality of the most recent year (2024). In Table S-2 (Management summary) and Table 21-2 (Chapter 21) the data quality scores are presented to one decimal place and are calculated according to the percentage of emissions per sector per scope.

The average data score for each sector is generated in several ways:

1. If the same data quality score is given for each scope within a sector, this is also the average score. This is the case for sectors housing related, joint arrangements, other public institutions, spatial planning and wind- and solar parks.
2. When different scopes within a sector have different data quality scores, the average data score is calculated by multiplying the data score for each scope by its percentage of GHG emissions. This is the case for sectors municipalities (loans, bonds and medium-term notes),

[18] PCAF (2022). The Global GHG Accounting and Reporting Standard Part A: Financed Emissions. Second edition.

provinces, water boards and sovereigns bonds and medium-term notes.

3. If, within a sector, a data quality score differs between clients, the data quality score per client is multiplied by the loan amount, then summed and finally divided by the total loan amount within the sector, as indicated in Chapter 6 of the *Financed Emissions The Global GHG Accounting & Reporting Standard Part A.*[19] This applies to social housing associations, education institutions, public transport, infrastructure and sector 'others'.
4. If, within a sector, a data quality score for a specific scope differs between clients, the data quality score per client is multiplied by the loan amount, then summed and finally divided by the total loan amount within the sector, as indicated in Chapter 6 of the *Financed Emissions The Global GHG Accounting & Reporting Standard Part A.*[20] Afterwards the average data score is calculated by multiplying the data score per scope by the percentage of GHG emissions per scope. This applies to healthcare institutions, drinking water companies, waste collection and processing, network operators (energy, telecom) and supranationals and public infrastructure bonds and medium-term notes.

As the data source and calculation method may differ between scopes and between items within a scope, several data quality scores are given for different scopes within a sector. The general factsheets in the sector specific chapters provide a detailed explanation of the reasons behind the data quality scores.

Table 2-1 Generic data quality table

Data quality (highest to lowest)	Description
1	Audited GHG emission data or actual primary energy data
2	Non-audited GHG emission data, or other primary data
3	Averaged data that is peer/(sub)-sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

[19] PCAF (2022). The Global GHG Accounting and Reporting Standard Part A: Financed Emissions. Second edition.

[20] Ibid.

2.4 Emission factors

To calculate the GHG footprint of BNG's loan portfolio, emission factors have been used to calculate emissions per tonne GHG emissions. Choosing the right emission factors is crucial. For this publication, the emission factors from CO2emissiefactoren.nl have been used in most cases. This list of emission factors is developed by the Dutch government, SKAO, Stimular, Connekt and Milieu Centraal.[21] This list is frequently updated and includes information on the system boundaries used, as well as providing a list of widely accepted and consistent emission factors.

PCAF has chosen to use the emission factors expressed in the 'Tank to Wheel' (TTW) column on CO2emissiefactoren.nl. This emission factor only includes emissions from the use of the energy source and not the production of the energy source. Where the term emission factor is used, this refers to CO_2-equivalents per unit.

An emission factor may change over time. Factors may change due to changes in methodology based on scientific evidence or due to changes in the context of the emission factor (gradual changes over time). For example, the emission factor for electricity from an unknown source. This emission factor is calculated based on the national energy production mix (e.g. the ratio between coal, nuclear, and renewable energy sources). This factor changes every year due to changes in the national energy mix.

Changes in CO_2 emission factors can affect the development of GHG emissions. Therefore, when calculating GHG emissions, it may be necessary to recalculate the GHG footprint of previous years in order to make an accurate comparison between them. CO2emissiefactoren.nl advises whether the revised emission factor should be used retroactively and specifies the effective date.

In this report, when emission data are presented longitudinally, the following three basic principles have been used to determine the emission factor:

[21] In March 2014, the Green Deal CO_2 equivalent emission factors were signed by the Dutch national government, SKAO, Stimular, Connekt and Milieu Centraal. Due to an increase in attention for CO_2 emission factors, more tools are created to calculate a footprint. However, confusion arises when companies and organisations use different figures. Creating a uniform list is a solution to this and that is why the Green Deal CO_2 equivalent emission factors was developed. The aim of the Green Deal is to arrive at a single, widely supported and scientifically substantiated list of CO_2 emission factors, based on generally accepted principles. The list concerns CO_2 data of energy carriers, passenger transport, goods transport and refrigerants. The primary target group consists of companies and organisations that use CO_2 equivalent emission data or calculation tools in their communications or reports. This shifts the discussion about the accuracy of the figures to what really matters: reducing GHG emissions.

1. Changes in emission factors over time due to changes in the national energy mix: use the emission factor corresponding to the year of the data. E.g. Use the 2024 emission factor for 2024 data.
2. Changes in emission factors over time due to technological development: use the emission factor corresponding to the year of the data. E.g. Use the 2024 emission factor for 2024 data.
3. Changes in emission factors over time due to new methodology or scientific evidence: use the most recent emission factor. E.g. Use the 2024 emission factor for 2023 data.

An overview of the emission factors used per year is provided in Appendix A. In general, emission factors have been chosen for each calculation and approach according to the data year.

An exception was made for district heating in the social housing sector. Two years ago, it was decided that the emission factor for 2022 would also be used for 2018 when calculating the GHG emissions for district heating.

Prior to 2022, the list of emission factors on CO2emissiefactoren.nl only contained one emission factor for a combined heat and power plant (heat from a large or small gas-fired CHP plant). This had to be used when the heat source of the heat network was unknown. The emission factor for this was 32.53 $kgCO_2e$ per GJ. However, since 2022, the list of emission factors on CO2emissiefactoren.nl includes an emission factor for average heat networks. This emission factor is 23.4 $kgCO_2e$ per GJ for 2022, which is much lower than the emission factor for before 2022. Because of this large difference and the lack of another emission factor for 2018, it was decided two years ago to apply the 2022 emission factor to 2018.

The sustainable performance of heating networks improves over time. Using the same emission factor for years prior to 2022 unfortunately does not take this improvement in performance into account.

This year, the specific heat network emission factor has been used as much as possible. Emission factors are available for large and medium-sized heat networks, but not for smaller heat networks. For the smaller networks, the average emission factor from CO2emissiefactoren.nl for 2024 was used. The specific emission factor used for large and medium-sized heat networks can be found in Appendix B of this report.

2.5 Methodology development is an ongoing process

Comparability and transparency of carbon accounting require consistent disclosure, following the same guidelines and methods, and ideally using the same metrics.[22] However, the methodology for carbon accounting is not yet set in stone. As data availability improves and/or methodologies evolve, more accurate calculations will become possible. Therefore, the total calculated GHG footprint that is presented throughout this report is not conclusive. Each time the methodology and used data improve, the results of previous years are recalculated where possible, so that comparisons can be made over time. BNG's baseline recalculation policy is that financed emissions, subject to feasibility, are normally recalculated for prior years (and including the reference year) unless specifically mentioned otherwise.

As attention to the reduction of GHG emissions grow and more organisations report on their GHG footprint, there is an increasing demand for reliable data and key metrics. It is also becoming increasingly important that organisations within the same sectors use consistent standards. As a result, the development of sector-specific metrics and the public availability of data continues to progress. These developments are leading to better data and metrics across various sectors. Due to the lack of sufficiently comprehensive and reliable data across several sectors, scope 3 emissions have not been included in this analysis for all sectors. This applies for example for the social housing sector and the educational institutions.

For this report, all developments have been closely monitored and improvements have been implemented wherever possible in the calculations of the GHG footprint. This year improvements were made for scopes 1 and 2 of municipalities and educational institutions and for the total healthcare sector.

For municipalities and educational institutions, the calculations now make use of key metrics from Vivet.[23] The inclusion of these figures introduces several enhancements to the carbon accounting methodology. Firstly, these standardised, sector-specific indicators support continuity and consistency in reporting across the sector. Furthermore, their national scope ensures broader recognition, as they are developed and validated through sector-wide collaboration.

[22] PCAF (2022). The Global GHG Accounting and Reporting Standard Part A: Financed Emissions. Second edition.

[23] VIVET (n.d.). Energieverbruik maatschappelijk vastgoed (Dutch website).

In the healthcare sector, key metrics from the Environmental barometer are applied, offering sector-specific emission factors and benchmarks tailored to healthcare providers.

The GHG footprint for municipalities and educational institutions has also been recalculated for the years 2018 and 2023. For the healthcare sector this was not possible due to the fact that the necessary data to calculate the GHG emissions with the new methodology are not available for the reference year.

3 BNG's loan portfolio

BNG's loan portfolio comprises several market segments. These segments cover several sectors or subsectors. Table 3-1 provides an overview of the loan portfolio for these sectors.

Table 3-1 Overview of BNG's loan portfolio in 2018, 2023 and 2024[24]

Market segment	Sector	Total loan portfolio (million euro)			Percentage of all loans (%)		
		2018	2023^	2024	2018	2023	2024
Housing	Social housing associations	38,947	45,957	50,013	47.7	52.4	54.5
	Housing related	496	784	884	0.6	0.9	1.0
Public sector	Municipalities	26,066	25,104	24,993	31.9	28.6	27.3
	Provinces	137	449	584	0.2	0.5	0.6
	Water boards	233	220	237	0.3	0.3	0.3
	Joint arrangements	1,362	1,303	1,290	1.7	1.5	1.4
	Other public institutions	768	510	493	0.9	0.6	0.5
Healthcare	Healthcare	7,031	6,629	6,329	8.6	7.6	6.9
Education	Educational institutions	979	1,035	1,002	1.2	1.2	1.1
Public infrastructure	Public transport	909	1,153	1,409	1.1	1.3	1.5
	Infrastructure	1,220	1,056	934	1.5	1.2	1.0
	Waste collection and processing	754	697	756	0.9	0.8	0.8
	Drinking water companies#	811	677	933	1.0	0.8	1.0
	Spatial planning	754	592	513	0.9	0.7	0.6
	Network operators (energy, telecom)	451	486	319	0.6	0.6	0.3
Others	Others	381	253	239	0.5	0.3	0.3
Energy	Renewable energy	309	808	724	0.4	0.9	0.8
	Sustainability projects	19	52	49	0.0	0.1	0.1
Total		**81,628**	**87,767**	**91,702**	**100.0**	**100.0**	**100.0**

^The current report does not include data for 2019, 2020, 2021 and 2022. It is decided to calculate 3 years: The reference year (2018) and the two most recent years, 2023 and 2024.

#For drinking water companies, the reference year is not 2018, but 2020. Sector specific data are presented in chapter 16.

As can be seen in Table 3-1, the social housing associations and municipalities represent the largest sectors within BNG's loan portfolio. The total loan portfolio increased by 3,935 million euro between 2023 and 2024.

[24] Reference date for the year 2024 is 31-12-2024, reference date for the year 2023 is 31-12-2023, and reference date for the year 2018 is 31-12-2018.

The final overview of all the calculations for 2018, 2023, and 2024 can be found in the data files referenced in the factsheet below.

List of the calculation sheets	Location
BNGDOCS-#3693552-v1-Kredietportefeuille per 31-12-2024.xlsx	\Werkmap\2_Data\2.1_Origineel met AVG\Leningportefeuille BNG
250212 Bankcijfers 2018 BNG.xlsx 251008 Bankcijfers 2023 BNG.xlsx	\Werkmap\2_Data\2.1_Origineel met AVG\Leningportefeuille BNG\Cijfers uit rapportage 2024

4 Housing: social housing sector

4.1 Results Social housing sector

The social housing sector is the largest sector within the loan portfolio of BNG. In 2024, the sector accounts for 54.5% of BNG's loan portfolio.

4.1.1 Coverage ratio and attribution

The GHG footprint was calculated for 100% of the social housing loan portfolio in 2024. Between 2023 and 2024, the outstanding loan volume increased by 4,055 million euro. The total balance sheet of clients for which a GHG footprint was calculated decreased by 17,079 million euro. As a result, the ratio of the loan portfolio to the total balance sheet slightly increased. Meaning the attribution to BNG slightly increased compared to last year. For 2018, 2023 and 2024, the loan portfolio, the total balance sheet and the coverage ratio are shown in Table 4-1.

Table 4-1 Loan portfolio, coverage ratio and ratio loan portfolio versus total balance sheet for the social housing sector in 2018, 2023 and 2024.

Year	Total loan portfolio (million euro)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)[&]	Coverage ratio of total loan portfolio (%)	Total balance sheet of clients for which a GHG footprint was calculated (million euro)[#]	Ratio loan portfolio / total balance sheet of clients for which a GHG footprint was calculated
2018	38,947	47.7	36,617	94.0	308,088	0.12
2023	45,957	52.4	45,957	100.0	429,014*	0.11*
2024	50,013	54.5	50,013	100.0	411,935**	0.12**

[&] To make sure that the coverage ratio for all three years is comparable, the loans and total balance sheet of social housing associations that have merged in the past few years have been summed and it is assumed that the energy consumption of the merged social housing associations are the same as the sum of the original ones.

[#] For 2023, total balance sheet data from 2022 were used, and for 2024, total balance sheet data from 2023 were used. This was because more recent data were not available in time for the calculations for each respective year.

*In 2023, 0.5% of the loan portfolio is excluded from this figure, as the GHG emissions were calculated using a less precise method rather than based on energy consumption.

** In 2024, 0.3% of the loan portfolio is excluded from this figure, as the GHG emissions were calculated using a less precise method rather than based on energy consumption.

4.1.2 Energy consumption and financed GHG emissions

Table 4-2 shows the total energy consumption of the social housing sector in 2018, 2023 and 2024. The total consumption of natural gas increased and the consumption of electricity decreased between 2023 and 2024. The emission factors for natural gas and electricity from an unknown source also decreased and the attribution to BNG slightly increased (Appendix A). These changes affect GHG emissions.

Table 4-2 Total energy consumption of the social housing sector in 2018, 2023 and 2024

Year	Natural gas consumption (m^3)	Electricity consumption (kWh)	Consumption of district heating (GJ)
2018	1,873,720,360	4,527,016,472	4,416,458
2023*	1,620,152,621	4,359,728,210	3,579,247
2024*	1,679,050,848	4,209,809,304	3,457,648

* In 2023, 0.5% of the loan portfolio is excluded from this figure, as the GHG emissions were calculated using a less precise method rather than based on energy consumption. In 2024, this applies to 0.3% of the loan portfolio.

Table 4-3 shows the calculated GHG footprint results for the social housing sector in 2018, 2023 and 2024.

Tabel 4-3 Absolute and relative financed GHG emissions for the social housing sector in 2018, 2023 and 2024

Source of emissions	Scopes	Financed GHG emissions (tCO_2e/year)			Financed GHG emissions (%)			Relative financed GHG emissions (tCO_2e/million euro)		
		2018	2023	2024	2018	2023	2024	2018	2023	2024
Natural gas	1	401,874	312,552	369,216	63.3	68.1	70.8	11.0	6.8	7.4
Electricity	2	221,620	137,986	141,177	34.9	30.1	27.1	6.1	3.0	2.8
District heating	2	11,748	8,453	11,185	1.8	1.8	2.1	0.3	0.2	0.2
Total	**1-2**	**635,242**	**458,990**	**521,577**	**100.0***	**100.0***	**100.0***	**17.3**	**10.0**	**10.4**

*The sum in these columns is not always exactly 100% due to rounding per sector

Table 4-4 Financed GHG emissions per financed floor area (m²) for the social housing sector in 2018, 2023 and 2024

Year	Financed GHG emissions real estate related ($kgCO_2e$) / financed m^2
2018	29.3
2023*	22.0
2024*	22.1

*In 2023, 0.5% of the loan portfolio is excluded from this figure, as the GHG emissions were calculated using a less precise method rather than based on energy consumption. In 2024, this applies to 0.3% of the loan portfolio.

Between 2023 and 2024, the financed GHG emissions increased for all scopes. Total financed GHG emissions increased by 62,587 tonnes. This increase is mainly due to the increase in scope 1 natural gas. The financed GHG emissions per financed m^2 increased by 0.1 $kgCO_2e/m^2$.

Due to an increase in loans of clients for which a GHG footprint was calculated and an increase in financed GHG emissions, the relative financed GHG emissions increased from 10.0 to 10.4 tonnes per million euro. In conclusion, both the absolute and relative financed GHG emissions for the social housing sector increased between 2023 and 2024. The decrease in energy prices may have led to increased energy consumption by households.

Housing associations are facing several challenges. By the end of 2028, no homes will be permitted to have an energy label of E, F or G. [25] By 2034, 450,000 existing properties must be gas-free. This will require alternative sources of heat. And by 2050, all housing association stock must be gas-free. To meet these goals, social housing providers are working hard to improve insulation and reduce energy consumption. Results indicate that these challenges remain.

[25] Aedes (2024). Nationale prestatieafspraken 2025 - 2035 (Dutch article).

4.1.3 Scopes 1 and 2

General factsheet

Scopes covered

For the social housing sector, scopes 1 and 2 are covered. Scope 1 covers natural gas consumption and scope 2 covers electricity and district heating consumption.

Portfolio covered

The social housing coverage ratio is 100% for 2024.

For 99.7% of the social housing loan portfolio, energy consumption data were available. For the remaining 0.3%, this data was not available and a less accurate calculation method was used.

Data

Data used for the housing associations with energy consumption data

Data on electricity and natural gas consumption are based on the connection registers from the three largest network operators in the Netherlands: Enexis, Liander, and Stedin. Due to privacy legislation, it is not possible to collect these data for individual dwellings. The data are therefore collected for small clusters of similar dwellings. The data are disaggregated to the level of a housing association.

The housing association's property data source is 'Kadaster'. [26]

The source for the floor area data is the Basic Registration of Addresses and Buildings (BAG).

Data on the presence of district heating comes from a data inventory performed by Republiq.

Consumption data of district heating are based on the connection registers of the energy network operators, collected by Statistics Netherlands (CBS). It is based on actual energy consumption and is therefore reliable. District heating consumption is available at the level of municipalities. For each municipality, the district heating consumption by dwellings owned by the social housing associations is known.

Data used for the housing associations lacking energy consumption data

For four social housing associations energy consumption data was not available (0.3 % of outstanding loans to this sector). The emissions of these clients have been calculated based on the outstanding loan amount and a PCAF emission factor.

[26] The Kadaster maintains registers of all real estate in the Netherlands, including land and buildings, detailing ownership and other rights.

Loan-specific information includes:

- NACE codes: Used to classify economic activities and map loans to the corresponding sectors and subsectors.
- Outstanding loan amounts: The nominal value of loans provided to clients, which serves as the basis for GHG emissions calculations.
- Subsector classifications: Detailed breakdowns of financed activities

Emission Factors:
Emission factors are applied according to the PCAF guidelines, using sector-specific data to estimate scope 1 (direct) and scope 2 (indirect from electricity) emissions. These factors are sourced from reputable databases and methodologies, including DEFRA, FAOSTAT, IPCC EFDB, Joint European Commission, Exiobase, and Probas. These emission factors are expressed in terms of tCO_2e per million euros financed.

Revenue and total balance sheet of the client:
For two housing associations the revenue and the total balance sheet over 2024 have been collected from their annual report.

Indexing of outdated climate data:
Data has been indexed based on the principle that in the adjustment of economic emissions intensities only the monetary value is adjusted, not the emissions in line with PCAF guidance. A CPI index for the Netherlands was used to adjust this.

Grid emission factors

Grid emission factors for the housing associations with energy consumption data

Appendix A provides further information on emission factors.

The following emission factors from Appendix A have been used:

- Natural gas
- Electricity (unknown source)
- Average heating networks

In addition, for some heating networks their own emission factors are used (see Appendix A).

Grid emission factors for the housing associations lacking energy consumption data

Grid emission factors represent the average GHG emissions associated with the generation and delivery of electricity consumed by financed organisations. For scope 2 emissions, these factors reflect the carbon intensity of the power grid in the region where the financed activities take place.

The grid emission factors are embedded within the sector-specific averages used for PCAF Classification Level 1. These factors ensure that the scope 2 emissions for the loan portfolio account for the electricity consumption of each sector, adjusted for regional variations in energy mix and grid intensity.

For this portfolio, grid emission factors are expressed as tCO_2e per million euros financed, providing a standardised approach to estimate indirect emissions from purchased electricity.

Calculation steps

Calculation steps for the housing associations with energy consumption data

Scope 1 natural gas use & scope 2 electricity use

The following steps have been taken by Republiq:

1. Inventory of dwellings owned by social housing associations
2. Joining energy consumption data

1. Inventory of dwellings owned by social housing associations

   Republiq has acquired the housing association's property data from 'Kadaster'. For each housing association Republiq knows the number of dwellings it owns, the floor area of each dwelling, and the energy class to which it belongs. Republiq has calculated the number of dwellings owned by each housing association and the total floor area of these dwellings. From BNG, Republiq obtained an overview of which housing associations are clients according to the loan portfolio as of 31-12-2024. Republiq combined this list from BNG with data from 'Kadaster' to add the number of dwellings and floor area owned by each housing association, where possible.

2. Joining energy consumption data

   Energy consumption data were requested from the three largest network operators (Enexis, Liander, and Stedin) in the Netherlands. For privacy reasons, the network operators are not allowed to provide energy consumption data for individual buildings. However, data for clusters of buildings (10 to 15 buildings) can be provided: per cluster the standard annual consumption (in Dutch 'standaard jaarafname' (SJA)[27]) has been provided. Republiq has divided the annual energy consumption data by the average floor area of the buildings in a cluster to obtain energy

[27] 'Standaard jaarafname' is the actual energy consumption recalculated to the expected energy consumption in a standard year. The actual energy consumption is corrected for a warmer or colder year, energy in one m^3, and the gas pressure.

consumption data per m^2. The energy consumption data per m^2 were assigned to the individual dwellings in a cluster. Republiq then performed an outlier check to ensure that only reliable data remained. The average energy consumption data per m^2 per housing association is multiplied by the total floor area owned by the housing association to obtain an estimate of the total consumption of electricity and gas. Republiq also provided an estimate of the electricity fed back into the grid.

Republiq provided Het PON & Telos with the following data per social housing association for the calculation of GHG emissions:

- Total electricity consumption (in kWh)
- Total gas consumption (in Nm^3)
- Total electricity fed back in the grid (kWh
- Floor area (m^2)

The next step was carried out by Het PON & Telos:
Het PON & Telos used these data to make the final calculations for both scope 1 natural gas consumption and scope 2 electricity consumption. The total electricity and natural gas consumption was multiplied by the emission factor from the same year as the data. For scope 1 natural gas consumption, the emission factor natural gas (Nm^3) was used. For scope 2 electricity consumption, the emission factor electricity (unknown source) (kWh) was used.

Floor area

The source for the floor area data is the Basic Registration of Addresses and Buildings (BAG). The reference date for the total floor area per housing association for the 2024 calculations is 1-1-2025. To calculate the financed GHG emissions per financed m^2 the total financed GHG emissions in tCO_2e for the social housing sector are divided by the total financed floor area (m^2) of the social housing sector.

Scope 2: District heating

The consumption of district heating per social housing association is not known. It was therefore necessary to make an estimate. The calculation consists of a few steps.

The CBS Microdata contains information on the use of district heating by all Dutch houses. Within the CBS Microdata database, **this dataset** was combined with another dataset containing information on the owners of these houses. Only dwellings owned by social housing associations were included in the calculation. CBS defines a dwelling as: the smallest unit within one or more buildings that is suitable for living in and is accessible through a private entrance from the public street, a yard or a common area. Examples include detached dwellings, single-family dwellings, apartments or terraced dwellings and student accommodations.

A dwelling is considered to be any residential property in the Basic Register of Addresses and Buildings (BAG) with at least one residential function and possibly one or more other functions. Thus, both self-contained and non-self-contained dwellings are included in these data.

For each municipality, district heating consumption was calculated for all dwellings owned by social housing associations. Outside the CBS Microdata database, district heating consumption was calculated for each social housing association. To calculate this, data from Republiq has been used. Republiq has obtained the property data of the housing associations from 'Kadaster'. For each housing association, Republiq estimated the number of dwellings it owns that is connected to district heating. These data were used to create the distribution key that allocates the GJ of district heating per municipality to the different housing associations.

The consumption of district heating per municipality for all dwellings owned by social housing associations was multiplied by the ratio of the number of dwellings with district heating of a given social housing association to the total number of dwellings with district heating of all social housing associations in a municipality. For each social housing association, the district heating consumption per municipality was added to give the total district heating consumption for that particular social housing association.

The use of district heating in GJ was multiplied by the emission factor for the specific heat network (large heat networks and only one per municipality) or the average heating networks (source: CO2emissiefactoren.nl) to obtain kg of GHG emissions. These emissions were divided by 1,000 to obtain tonnes of GHG emissions.

After calculating scope 1 and scope 2 GHG emissions, these GHG emissions were multiplied by the ratio of outstanding loan to total balance sheet ratio per client. For example, if the ratio of outstanding loan to total balance sheet is 25%, 25% of the social housing association's scope 1 and 2 GHG emissions are attributed to BNG. The financed GHG emissions per client are added up to result in the total financed GHG emissions per sector.

Unfortunately, the 2024 total balance sheet data were not available at the time of these calculations. Therefore, the financed GHG emissions for 2024 have been calculated based on the total balance sheet for 2023.

To make sure that the coverage ratio for all three years is comparable, the loans and total balance sheet of social housing associations that have merged in the past few years have been summed and it is assumed that the energy consumption of the merged social housing associations are the same as the sum of the original ones.

The financed GHG emissions and relative financed emissions are reported per scope. The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume in million euro of the clients for which a GHG footprint was calculated in this report.

Calculation steps for the housing associations lacking energy consumption data

The calculation of GHG emissions follows a standardised approach based on the PCAF methodology, utilizing the 3b method for business loans and unlisted equity. For two social housing associations, the 3a method has been used, which links emissions to the borrower's revenue.

Both methods apply emission factors based on economic activity, using sector-specific averages provided through recognised databases. These emission factors are aligned with the primary business activities of the financed organisation and reflect emissions per unit of assets. Data quality is assessed in alignment with PCAF standard.

1. *Emission factor assignment:*

The NACE code of each social housing association is used to find the sector-specific emission factors.

2. *Loan attribution:*

The GHG emissions for each loan are attributed based on the outstanding loan amount relative to the total emissions associated with the financed activity. This ensures that the GHG emissions reflect the financial share of the organisation covered by the loan.

For two social housing associations the GHG emissions are based on the client's revenue. An attribution factor is applied: outstanding loan amount (€) / client's total balance sheet (€).

3. *Indexing of outdated climate data:*

The emission factor has been adjusted by using a CPI index for the Netherlands.

4. *Financed GHG Emissions:*

For each loan, GHG emissions are calculated using the formula:

Financed GHG Emissions (tCO_2e) = Outstanding Loan Amount (€) * Emission Factor (tCO_2e/M. Euro)

In case of the 3a method (revenue) the emissions are calculated using the formula:

Financed GHG Emissions (tCO_2e) = (Outstanding Loan Amount (€) / Balance Total (€)) * Revenue (€) * Emission Factor (tCO_2e/M. Euro)

5. *Data Quality assessment:*

Each calculation is assigned a Data Quality (DQ) score based on the PCAF standards. Higher scores indicate reliance on sector averages rather than borrower-specific data.

Avoided emissions

If housing associations generate their own electricity, for example through solar panels, and use it directly, this energy consumption is not included in the calculation of GHG emissions or avoided emissions.

Self-generated electricity that is fed back into the grid represents avoided emissions. For the housing associations in the BNG's portfolio, this amounts to 491,521,931 kWh of electricity and 27,088 tonnes financed GHG emissions for 2024.

These data were provided by Republiq per housing association and the kWh was multiplied by the grey energy emission factor for 2024 and the ratio of loans to total balance sheet to result in the avoided financed emissions.

Asset class specific considerations

For the calculation based on energy consumption data, the approach for the social housing associations is in line with the approach of asset class 'Mortgages'. Energy consumption of financed buildings (scope 1 and 2) is covered.

Attribution

Attribution for the housing associations with energy consumption data

To calculate the GHG footprint according to the PCAF principles, a general approach has been developed. First, the GHG emissions of the different entities in the sector are calculated. Then, the BNG's share of the total balance sheet is used to determine the share of GHG emissions for which BNG is responsible.

$$\sum \boldsymbol{CO_2eq} \times \frac{\boldsymbol{Outstanding\ loan\ volume}}{\boldsymbol{Total\ balance\ sheet\ (equity + debt)}}$$

Finally, the individual scopes and the sum of the scopes of all individual organisations have been aggregated.

Attribution for the housing associations lacking energy consumption data

Method 3a (revenue):
GHG emissions are attributed to BNG based on the following attribution factor:

Outstanding Loan Amount (€)/ Client's total balance sheet (€))

This formula ensures emissions are accurately scaled to BNG's financial contribution and the borrower's economic output.

Method 3b (outstanding loan amount): GHG emissions are attributed to BNG based on its proportional financial involvement in the borrower's operations. For business loans, this is calculated as the outstanding loan amount relative to the borrower's total financial needs. This ensures that reported GHG emissions correspond to BNG's share of responsibility for the financed activities, in alignment with the PCAF methodology.

Absolute vs. relative emissions

For the social housing sector, the total financed GHG emissions were calculated in tonnes CO_2e.

The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume of the clients for which a GHG footprint was calculated in this report.

Limitations

Limitations for the housing associations with energy consumption data

For several social housing associations data on the total balance sheet were not available. For these associations, the total balance sheet was calculated based on the average ratio outstanding loan volume / total balance sheet. However, this may have been over- or underestimated.

Scope 1 natural gas use & scope 2 electricity use

Some of the housing associations in BNG's loan portfolio were not included in Republiq's data set because these housing associations are not members of the Aedes trade association. For those housing associations that are not members of the Aedes trade association, property data has not been retrieved from Kadaster. Therefore, no data are available on the number of dwellings and floor area owned.

Energy consumption data were only collected from the three largest network operators. No data are available for housing associations operating outside the regions in which these operators are active.

For privacy reasons it is not possible to collect energy consumption data for individual dwellings. Data has been collected for small clusters of comparable dwellings within a housing association. These data have been aggregated to the housing association level.

For energy consumption, the standard annual consumption (in Dutch 'standaard jaarafname'(SJA) was used. 'Standaard jaarafname' is the actual energy consumption recalculated to the expected energy consumption in a standard year. The actual energy consumption is adjusted for annual temperature variations, energy density per m^3 and gas pressure.

Scope 2 District heating

Unfortunately, Het PON & Telos does not have data on the allocation of dwellings to specific social housing associations. Therefore, the district heating per social housing association had to be estimated based on the ratio of the number of dwellings per social housing association with district heating to the total number of dwellings of all social housing associations with district heating in a municipality. Factors such as the type of dwelling are not considered in the allocation key. The accuracy of the data can be improved by identifying which dwellings are owned by specific social housing associations. However, these data are not available. This will not affect the total GHG emissions of the sector but will affect the sector level GHG emissions attributed to the Bank.

The most recent data available from CBS on district heat consumption from a social housing association is for the year 2022. Therefore, the data on heat consumption from a heat network used in this report is from 2022 instead of 2023.

The GHG emissions of the social housing associations themselves (scopes 1, 2, and 3) are not included in this report.

Limitations for the housing associations lacking energy consumption data

Data availability: for many loans, borrower-specific data are not available. Especially relatively smaller companies do not disclose information on GHG emissions. Therefore, a method with a lower PCAF data quality score has been used.

Data quality: PCAF recommends using the Classification Level 2 emission factors for internal analysis only. As a result, Classification level 2 cannot be used for this calculation. Within Classification level 1, it is not possible to distinguish between subsectors. This results in the reliance on the more aggregated Classification Level 1 emission factors, which introduces inherent uncertainties, particularly for sectors with high variability in emissions profiles.

Data quality estimate

Data quality score for the housing associations with energy consumption data

Scope 1 natural gas use & scope 2 electricity use

For 99.7% of the outstanding loans to this sector, the data quality score is 2.

Primary data on actual building energy consumption (adjusted for annual temperature variations, energy density per m^3 and gas pressure) are available.

According to option 1b in Table 5-14 on page 92 of the PCAF (2022) report[28] , the data quality is 2.

Part of the data are based on energy consumption data provided by the three largest energy suppliers in the Netherlands for clusters of buildings. Due to privacy regulations, it is not possible to collect these data for individual dwellings. The data are therefore collected for small clusters (10 to 15 buildings) of similar dwellings, which is sub-sector specific. The data has been aggregated to the level of a housing association. However, as the energy consumption data are more specific than sector specific, the data score is 2.

Scope 2 District heating

For the outstanding loans to this sector where district heating applies, the data quality score is 2. Primary data on actual heat consumption per building is available and has been aggregated at the level of housing associations. The number of dwellings connected to district heating networks is known for each housing association and each municipality. In addition, consumption data for district heating is available per dwelling and has been aggregated to the municipal level before being allocated to the relevant portfolios. As these data are more specific than sector-level information and are based on actual energy consumption per building, the data quality is assessed as score 2 in line with option 1b in Table 5-14 on page 92 of the PCAF (2022) report.

The emission factors used are specific to the major district heating networks. Although the data are not verified by an external auditor, they are calculated at the level of individual housing associations (i.e. institution-specific) and therefore meet the criteria for data quality score 2.

Data quality score for the housing associations lacking energy consumption data

For 0.5% of outstanding loans to this sector, the data quality score is 5. GHG emissions were calculated based on the outstanding loan amount and emission factor. This results in data quality score 5, reflecting the exclusive use of sector-specific emission factors in the absence of borrower-specific information.

[28] PCAF (2022). The Global GHG Accounting and Reporting Standard Part A: Financed Emissions. Second edition.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data files mentioned in the factsheet below.

List of the calculation sheets	Location
bBNG.tWOCO_Leningportefeuille.csv bCBSMicordata.tWOCO_Stadsverwarming_versie2025 bCO2Emissiefactoren.tEmissiefactorenStadsw2023 bDVI.tWOCO_Passiva_BNG bRepubliq.tBNG_WOCO_Enerigevebruik_versie2025 emissiefactoren - PCAF 2025.csv	\Werkmap\Woningcorporaties\d. Data voor SQL \Werkmap\Emissiefactoren\c. Voorbewerkte data
250829_BNG_WOCO_2024_versie2025.ipynb	\Werkmap\Woningcorporaties\e. SQL notebooks
251019 pBNG.tWOCO_2024_CO2voetafdruk_Absoluut_Totaal_versie2025.xlsx 251019 pBNG.tWOCO_2024_CO2voetafdruk_Relatief_Totaal_versie2025.xlsx 251019 pBNG.tWOCO_2024_IndividueleKlanten_versie2025.xlsx 251019 pBNG.tWOCO_2024_Ratio_Lening_Passiva_versie2025.xlsx	\Werkmap\Woningcorporaties\f2. Data uit SQL BNG
BNGDOCS-#3705647-v3-Totaaloverzicht berekende emissies door S&S _ Kredietportefeuille	\Werkmap\2_Data\2.1_Origineel met AVG\Leningportefeuille BNG\Berekeningen door BNG aangeleverd
251021 samenvoeging pBNG.tWOCO_2024_IndividueleKlanten_versie2025.xslx	\Werkmap\Woningcorporaties\f4. Berekening BNG

5 Housing: housing related

5.1 Results housing related sector

The housing related sector is a small sector within the loan portfolio of BNG. In 2024, the sector accounts for 1.0% of BNG's loan portfolio.

Tables 5-1 and 5-2 show the results for the housing related sector in 2023 and 2024. The GHG footprint was calculated for 100% of the housing related loan portfolio in 2024. Between 2023 and 2024, the outstanding loan volume increased by 100 million euro. The loan portfolio of clients for which a GHG footprint was calculated increased by 100 million euro as well.

Between 2023 and 2024, the financed GHG emissions increased for all scopes. Total financed GHG emissions increased by 180 tonnes. This increase is mainly due to an increase in scope 3. Even though there was an increase in loans of clients for which a GHG footprint was calculated and an increase in financed GHG emissions, relative financed GHG emissions decreased from 6.9 to 6.3 tonnes per million euro.

In conclusion, the absolute financed GHG emissions for the housing related sector increased between 2023 and 2024, while the relative financed GHG emissions decreased between 2023 and 2024.

The relative financed GHG emissions (Table 5-2) show that this is not a GHG intensive sector.

Table 5-1 Loan portfolio and coverage ratio of the housing related sector in 2023 and 2024

Year	Total loan portfolio (million euro)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)	Coverage ratio of total loan portfolio (%)
2023	784	0.9	784	100
2024	884	1.0	884	100

Table 5-2 Absolute and relative financed GHG emissions for the housing related sector in 2023 and 2024

Scope	Financed GHG emissions (tCO_2e/year)		Financed GHG emissions (%)		Relative financed GHG emissions (tCO_2e/million euro)	
	2023	2024	2023	2024	2023	2024
1	735	777	13.6	13.9	0.9	0.9
2	295	320	5.5	5.7	0.4	0.4
3	4,364	4,479	80.9	80.3	5.6	5.1
Total	**5,395**	**5,575**	**100.0***	**100.0***	**6.9**	**6.3**

*The sum in these columns is not always exactly 100% due to rounding per sector

5.2 Housing related approach

General factsheet

Scopes covered

For the housing related sector, scopes 1, 2 and 3 are covered.

Portfolio covered

The housing related sector coverage ratio is 100% for 2024.

Data

Loan-specific information includes:

- NACE codes: Used to classify economic activities and map loans to the corresponding sectors and subsectors.
- Outstanding loan amounts: The nominal value of loans provided to clients, which serves as the basis for GHG emissions calculations.
- Subsector classifications: Detailed breakdowns of financed activities

Emission Factors:
Emission factors are applied according to the PCAF guidelines, using sector-specific data to estimate scope 1 (direct) and scope 2 (indirect from electricity) and scope 3 (other indirect) emissions. These factors are sourced from reputable databases and methodologies, including DEFRA, FAOSTAT, IPCC EFDB, Joint European Commission, Exiobase, and Probas. These emission factors are expressed in terms of tCO_2e per million euros financed.

Indexing of outdated climate data:
Data has been indexed based on the principle that in the adjustment of economic

emissions intensities only the monetary value is adjusted, not the emissions in line with PCAF guidance. A CPI index for the Netherlands was used to adjust this.

Grid emission factors

Grid emission factors represent the average GHG emissions associated with the generation and delivery of electricity consumed by financed organisations. For scope 2 emissions, these factors reflect the carbon intensity of the power grid in the region where the financed activities take place.

The grid emission factors are embedded within the sector-specific averages used for PCAF Classification Level 1. These factors ensure that the scope 2 emissions for the loan portfolio account for the electricity consumption of each sector, adjusted for regional variations in energy mix and grid intensity.

For this portfolio, grid emission factors are expressed as tCO_2e per million euros financed, providing a standardised approach to estimate indirect emissions from purchased electricity.

Calculation steps

The calculation of GHG emissions follows a standardised approach based on the PCAF methodology, utilizing the 3b method for business loans and unlisted equity to ensure consistency in the assessment of financed emissions. This methodology applies emission factors based on economic activity, using sector-specific averages provided through recognised databases. These emission factors are aligned with the primary business activities of the financed organisation and reflect emissions per unit of assets.

The 3b method ensures emissions are attributed proportionally to BNG's share of financing, relative to the borrower’s total financial needs. This approach leverages emission factors validated through established methodologies, ensuring they are consistent with the activities financed by the bank. Data quality is assessed in alignment with PCAF standard.

1. *Emission factor assignment:*

The NACE code of each company in the loan portfolio is used to determine the sector-specific emission factors. In addition, expert judgement was used when the mapping based on NACE codes seemed less reliable. In these cases, a better fit was made based on the subsector classification or more detailed information on the activities of the company. This information was largely derived from internal documents prepared by our credit department.

2. *Loan attribution:*

The GHG emissions for each loan are attributed based on the outstanding loan amount relative to the total emissions associated with the financed activity. This ensures that the GHG emissions reflect the financial share of the organisation covered by the loan.

3. *Indexing of outdated climate data:*

The emission factor has been adjusted by using a CPI index for the Netherlands.

4. *Financed GHG Emissions:*

For each loan, GHG emissions are calculated using the formula:

Financed GHG Emissions (tCO_2e) = Outstanding Loan Amount (€) * Emission Factor (tCO_2e/M. Euro)

5. *Data Quality assessment:*

Each calculation is assigned a Data Quality (DQ) score based on the PCAF standards. Higher scores indicate reliance on sector averages rather than borrower-specific data.

Avoided emissions

Not applicable

Asset class specific considerations

No additional considerations

Attribution

GHG emissions are attributed to BNG based on its proportional financial involvement in the borrower's operations. For business loans, this is calculated as the outstanding loan amount relative to the borrower's total financial needs. This ensures that reported GHG emissions correspond to BNG's share of responsibility for the financed activities, in alignment with the PCAF methodology.

Absolute vs. relative emissions

For the housing related sector, the total financed GHG emissions were calculated in tonnes CO_2eq.

The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume of the clients for which a GHG footprint was calculated in this report.

Limitations

Data availability: for many loans, borrower-specific data are not available. Especially relatively smaller companies do not disclose information on GHG emissions. Therefore, emissions were calculated based on outstanding loan amounts, resulting into a lower PCAF data quality score.

Scope 3 complexity: indirect emissions, particularly for scope 3, are estimated using economic activity data, which may not fully capture the variability in emissions across borrowers.

Data quality: PCAF recommends using the Classification Level 2 emission factors for internal analysis only. As a result, Classification level 2 cannot be used for this calculation. Within Classification level 1, it is not possible to distinguish between subsectors. This results in the reliance on the more aggregated Classification Level 1 emission factors, which introduces inherent uncertainties, particularly for sectors with high variability in emissions profiles.

Data quality estimate

Data quality score is 5. GHG emissions were calculated based on the outstanding loan amount and an emission factor. This results in data quality score 5, reflecting the exclusive use of sector-specific emission factors in the absence of borrower-specific information.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data file mentioned in the factsheet below.

List of the calculation sheets	Location
BNGDOCS-#3705647-v3-Totaaloverzicht berekende emissies door S&S _ Kredietportefeuille	\Werkmap\2_Data\2.1_Origineel met AVG\Leningportefeuille BNG\Berekeningen door BNG aangeleverd

6 Public sector: municipalities

6.1 Results public sector: municipalities

In 2024, municipalities represent 27.3% of BNG's total loan portfolio, making them the second-largest sector within BNG's loan portfolio.

6.1.1 Coverage ratio and attribution

As in previous years, the coverage ratio for municipalities is 100%. Between 2023 and 2024, the outstanding loan volume decreased by 111 million euro. The total balance sheet of clients for which a GHG footprint was calculated increased. As a result, the ratio of the loan portfolio to the total balance sheet decreased. The attribution to BNG decreased compared to last year. For 2018, 2023 and 2024, the loan portfolio, the total balance sheet and the coverage ratio are shown in Table 6-1.

Table 6-1 Loan portfolio, coverage ratio and ratio loan portfolio versus total balance sheet for the municipalities in 2018, 2023 and 2024

Year	Total loan portfolio (million euro)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)	Coverage ratio of total loan portfolio (%)	Total balance sheet of clients for which a GHG footprint was calculated (million euro)	Ratio loan portfolio / total balance sheet of clients for which a GHG footprint was calculated
2018	26,066	31.9	26,006	99.8	87,394	0.30
2023	25,104	28.6	25,104	100.0	103,361	0.24
2024	24,993	27.3	24,993	100.0	109,134	0.23

6.1.2 Energy consumption and financed GHG emissions

Natural gas decreased and electricity consumption increased between 2023 and 2024. The emission factors for natural gas and electricity (unknown source) also decreased and the attribution to BNG decreased. These changes affect GHG emissions.

Table 6-2 Total energy consumption of the municipalities in 2018, 2023 and 2024

Year	Natural gas consumption (m^3)	Electricity consumption (kWh)
2018	225,887,479	664,431,175
2023	235,771,303	905,556,362
2024	229,299,418	999,173,805

Table 6-3 shows the calculated GHG footprint results for the Dutch municipalities in 2018, 2023 and 2024.

Table 6-3 Absolute and relative financed GHG emissions for municipalities in 2018, 2023 and 2024

Source of emissions	Scopes	Financed GHG emissions (tCO_2e/year)			Financed GHG emissions (%)			Relative financed GHG emissions (tCO_2e/million euro)		
		2018	2023	2024	2018	2023	2024	2018	2023	2024
Natural gas	1	123,532	100,608	91,296	12.3	11.9	10.9	4.8	4.0	3.7
Fossil fuel (cars)	1	3,631	2,338	2,453	0.4	0.3	0.3	0.1	0.1	0.1
Electricity	2	82,130	63,521	60,907	8.2	7.5	7.3	3.2	2.5	2.4
Purchased goods and services	3	792,474	675,974	680,519	79.1	80.2	81.5	30.5	26.9	27.2
Total	**1-2-3**	**1,001,767**	**842,442**	**835,176**	**100.0***	**100.0***	**100.0***	**38.5**	**33.6**	**33.4**
Total	**1-2**	**209,293**	**166,467**	**154,656**	**20.9**	**19.8**	**18.5**	**8.0**	**6.6**	**6.2**

*The sum in these columns is not always exactly 100% due to rounding per sector

Table 6-4 Financed GHG emissions per financed floor area (m^2) for the municipalities in 20218, 2023 and 2024

Year	Financed GHG emissions real estate related ($kgCO_2e$) / financed m^2
2018	35.6
2023	24.0
2024	22.4

Between 2023 and 2024 the financed GHG emissions decreased for scope 1 natural gas consumption and scope 2 electricity consumption. The financed GHG emissions increased for both scope 1 fossil fuel (cars) and scope 3. As mentioned above, the total consumption of natural gas decreased between 2023 and 2024, while the total consumption of electricity increased (Table 6-2). Overall, the ratio loan portfolio to total balance sheet decreased between 2023 and 2024. These changes resulted in an increase in financed GHG emissions for scope 3, but a decrease in financed GHG emissions for both scope 1 and 2.

The total financed GHG emissions decreased by 7,266 tCO2e. This decrease is mainly due to a decrease in scope 1 GHG emissions for natural gas consumption, which decreased by 9,312 tonnes. The scope 3 change is due to a decrease in the emission factor per sector and due to an increase in the expenditure on procurement of goods and services between 2023 and 2024. Municipal expenditure on goods and services increased between 2023 and 2024. Using the spend-based calculation method for scope 3, these increased expenditures result in higher GHG emissions, but it is not possible to say with certainty whether these increased expenditures are associated with higher GHG emissions in practice.

The relative GHG emissions decreased from 33.6 to 33.4 tonnes per million euro. This is due to a decrease in relative financed GHG emissions for scope 1 natural gas consumption and scope 2 electricity use. The GHG emissions for scope 3 increased and influenced both the absolute (>80%) and relative financed GHG emissions. Because the data quality of scope 3 is poor (score 4), no hard conclusions can be drawn from these numbers.

The financed GHG emissions per m^2 of scope 1 natural gas consumption and scope 2 electricity consumption decreased between 2023 and 2024 and between 2018 and 2024 (Table 6-4).

6.2 Public sector: municipalities approach

6.2.1 Scopes 1 and 2

Adjustments in methodology

To estimate energy consumption, Republiq uses key figures provided by Vivet.[29] These figures became available this year for 2022 and 2023. As the methodology differs from that used in previous years, the GHG emissions for 2018 and 2023 have also been recalculated using these updated figures. For 2018 and 2024, an estimate has been made based on the trends in energy consumption as published by CBS.[30]

The differences between the results of the new and previous methodology are shown in Table 6-5.

Table 6-5 Effect of change in methodology on the GHG emissions in tCO_2e

Source of emissions	Scopes	New 2023	Previous 2023	Difference (%)* 2023	New 2018	Previous 2018	Difference (%)* 2018
Natural gas	1	100,608	149,619	-32.8	123.532	161.209	-23.4
Electricity	2	63,521	85,357	-25.6	82.130	122.617	-33.0

*The difference is calculated with the following formula: (New-Previous)/Previous*100

General factsheet scopes 1 and 2

Scopes covered

For municipalities, scope 1 natural gas consumption, scope 1 fossil fuel use by company cars, scope 2 electricity consumption and scope 3 purchased goods and services are covered.

Portfolio covered

Data are collected for all municipalities in the Netherlands. This means that the coverage ratio for this sector is 100%.

[29] VIVET (n.d.). Energieverbruik maatschappelijk vastgoed (Dutch website).
[30] CBS (2025). Energiebalans; aanbod en verbruik, sector (Dutch website).

Loans are issued by the bank to municipalities. BNG also holds debt securities for municipality bonds and medium-term notes. Bonds and medium-term notes are not included in 2018 but are included in 2023 and 2024. Therefore, a distinction has been made between loans and bonds and medium-term notes within the municipal loan portfolio. The carbon footprint has been calculated separately for bonds and medium-term notes and loans so that the calculated GHG footprint of the loan portfolio in 2018 can be compared to the loan portfolio in 2023 and 2024.

Data

For scope 1 natural gas consumption and scope 2 electricity consumption, 2024 data were used. For scope 1 fossil fuel consumption of company cars, the calculation was made with partial use of 2023 data.

The data used in this approach comes from several sources.

For scope 1 natural gas consumption and scope 2 electricity consumption, energy consumption data for buildings owned by municipalities were used. Republiq provided the energy consumption data to Het PON & Telos. When specific information on building function or construction was not available, Republiq used estimates based on similar building types and characteristics

Het PON & Telos calculated the GHG emissions for scope 1 fossil fuel consumption of company cars, using several data sources. Ideally, the litres of fuel consumed, or kilometres driven by the company cars would be multiplied by the corresponding emission factor to obtain the GHG emissions of company cars. However, data on fuel consumption or kilometres driven are not available for each individual municipality, but only in total for all municipalities. Therefore, a calculation was made to estimate the GHG emissions of company cars by using several data sources. The data used for this calculation are summarised in this section. More information on the calculation can be found in the calculation steps section.

The data on the number of employees working for SBI-code 8411 (general government administration, which includes municipalities, as well as provinces and ministries) and the data on the number of employees working for the entire public administration and government services sector come from Lisa. Lisa serves as the national information system on jobs in the Netherlands and maintains a comprehensive database with information on all places where paid work is performed. The data are provided based on the 2024 municipality classification. Consequently, all other data used were reclassified to match the 2024 municipality classification to ensure coverage of all municipalities present in the Lisa dataset.

Data on the number of employees working for the provincial government organisation come from 'A&O fonds provincies'. ‘A&O fonds provincies' is an organisation that provides governments with practical tools, knowledge and subsidies. These data are available at the aggregated level of the provinces.

Data on the number of passenger cars owned by enterprises per sector come from the Dutch Central Bureau of Statistics (CBS). The data originate from the vehicle register (RDW), which ensures their reliability and accuracy.

Data on the number of kilometres travelled by car per year comes from the Dutch Central Bureau of Statistics (CBS) and covers the average number of kilometres travelled per year by a passenger car registered in the Netherlands. The original data come from the RDW's Online Kilometre Registration (OKR), which ensures its reliability.

Grid emission factors

Appendix A contains more information on emission factors. The following emission factors from Appendix A have been used:

- Natural gas
- Electricity (unknown source)
- Passenger transport, Car, Fuel type unknown, weight class unknown.

Calculation steps

Scope 1 natural gas use & scope 2 electricity use

The following steps have been performed by Republiq:

1. Inventory of buildings owned by municipalities
2. Estimate energy consumption data

1. Inventory of buildings owned by municipalities

Republiq has a dataset called 'dataset maatschappelijk vastgoed'. This dataset contains all buildings owned by municipalities and/or used for public purposes such as education, sports, welfare and culture. Republiq filtered out all buildings owned by municipalities. Republiq has acquired the property data from ‘Kadaster’.[31]

[31] The Kadaster maintains registers of all real estate in the Netherlands, including land and buildings, detailing ownership and other rights.

2. Estimate energy consumption data

To estimate energy consumption, Republiq uses key figures provided by Vivet.[32] In the Vivet project, CBS and Kadaster collaborated to provide insights into energy consumption across various sectors of public real estate. The key figures are available for the years 2022 and 2023. For 2024 and 2018, an estimate has been made on the trends in energy consumption as published by CBS.[33]

Republiq combines these estimates with the dataset from step 1 on the function and construction period of the buildings. The result of this step is a dataset containing all buildings owned by municipalities with an estimated value for energy consumption in 2018, 2023 and 2024.

Republiq provided Het PON & Telos with the following data:

- Total electricity consumption (in kWh)
- Total gas consumption (in Nm^3)
- Floor area (m^2)

The next step was carried out by Het PON & Telos:

To make the final calculations for both scope 1 natural gas consumption and scope 2 electricity consumption, the total electricity and natural gas consumption was multiplied by the corresponding emission factor from the same year as the data. For scope 1 natural gas consumption, the emission factor natural gas (Nm^3) was used. For scope 2 electricity consumption, the emission factor electricity (unknown source) (kWh) was used.

Floor area

The source of the floor area data is the Basic Registration of Addresses and Buildings (BAG). The reference date for the total floor area of buildings owned by municipalities is 1-1-2025. To calculate the financed GHG emissions per financed m^2, the total attributed GHG emissions in tCO_2e for the municipalities were divided by the total financed floor area (m^2) of the municipalities.

Scope 1 fossil fuel for company cars

Scope 1 emissions also include fossil fuel emissions from company cars. For this calculation, the number of employees working for the total public administration and government services sector and the number of employees working for a general government administration (SBI code 8411: general government

[32] VIVET (n.d.). Energieverbruik maatschappelijk vastgoed (Dutch website).

[33] CBS (2025). Energiebalans; aanbod en verbruik, sector (Dutch website).

administration, which includes municipalities as well as provinces and ministries), both per municipality, were used.

The number of company cars used in the entire public administration and government services sector is known (CBS Statline). To calculate the total number of company cars for the municipalities, the number of company cars used by the total public administration and government services sector was multiplied by the percentage of employees working for the municipalities in relation to all employees working for the Dutch public administration and government services sector.

Company cars owned by Dutch municipalities were distributed to each municipality according to its share of municipal employees. This was multiplied by the number of kilometres travelled per company car (all fuel types) and multiplied by the emission factor for passenger transport, car, fuel type unknown, weight class unknown (Table 2-4). The GHG emissions were divided by a factor of 1,000 to obtain the GHG emissions in tonnes for company cars.

After calculating scope 1 and scope 2 GHG emissions, these GHG emissions were multiplied by the ratio of outstanding loan to total balance sheet ratio per client. For example, if the ratio of outstanding loan to total balance sheet is 25%, 25% of the municipality's scope 1 and 2 GHG emissions are attributed to BNG. The financed GHG emissions per client are added up to result in the total financed GHG emissions per sector.

The financed GHG emissions and relative financed GHG emissions are reported per scope. The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume in million euro of the clients for which a GHG footprint was calculated in this report.

The final calculated values for scopes 1 and 2 and the total balance sheet have been reallocated to the 2024 municipal division for all calculated years.

Avoided emissions

For municipalities, avoided emissions are unknown. It is unknown whether municipalities generate their own renewable energy and feed it back into the grid.

Asset class specific considerations

The approach for municipalities is in line with the public loan approach in the PCAF methodology.

Attribution

To calculate the GHG footprint according to the PCAF principles, a general approach has been developed. First, the GHG emissions of the different entities in the sector are calculated. Then, the BNG's share of the total balance sheet is used to determine the share of GHG emissions for which BNG is responsible.

$$\sum \boldsymbol{CO_2eq} \times \frac{\boldsymbol{Outstanding\ loan\ volume}}{\boldsymbol{Total\ balance\ sheet\ (equity + debt)}}$$

Finally, the individual scopes and the sum of the scopes of all individual organisations have been aggregated.

Absolute vs. relative emissions

For the municipalities, the total financed GHG emissions were calculated in tonnes.

The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume of the clients for which a GHG footprint was calculated in this report.

Limitations

Scope 1 natural gas use & scope 2 electricity use

The key figures are not available for specific functions. Therefore, the actual consumption of a building may differ from the key figures used.

Some municipal buildings have multiple functions, including a school. It is therefore possible that a small number of schools are included in the municipality buildings.

Scope 1 fossil fuel for company cars

No recorded data are available per municipality on company cars, including details such as number of cars, car types and fuel types. The best possible result is achieved by using the current model(s). Many municipalities are actively working to improve the sustainability of their operations. As part of this effort, they are focusing on making their vehicle fleets more sustainable. However, the calculation method used in this project does not reflect this development. As a result, the GHG emissions from company cars are a relatively rough estimate and may differ from the actual situation due to developments in making the local authority fleet more sustainable. In addition to cars, municipalities also have other means of transport such as scooters and (electric) bicycles. The use of these means of transport is not included in the calculated GHG emissions for company cars.

Data quality estimate

Scope 1 natural gas use & scope 2 electricity use

Data quality score 3. Key figures of public real estate are used. The key figures are available for the years 2022 and 2023. For 2024 and 2018, an estimate has been made on the trends in energy consumption as published by CBS.[34]

[34] CBS (2025). Energiebalans; aanbod en verbruik, sector (Dutch website).

Scope 1 fossil fuel for company cars

The GHG emissions calculations are based on average car information. Brand, model, and type are not known, and distance travelled is based on local or regional statistical data. See option 3b in Table 5-16 on page 106 of the report PCAF (2022).[35] Therefore, the data quality score is 5.

Calculation sheets

The final overview of all the calculations for 2018, 2023 and 2024 can be found in the data files mentioned in the factsheet below.

List of the calculation sheets	Location
250925 energiedata BNG onder elkaar gezet.xlsx 250902 bewerking aantal banen sector O gemeente.xlsx 250902 berekening sbi 8411 zonder provincie 2024.xlsx 250919 leningportefeuille BNG gemeente 2018.xlsx	\Werkmap\Gemeenten\c. Voorbewerkte data
bBNG.tGemeente_Leningportefeuille_Loans.csv bCBSstatline.tGemeente_Passiva.csv bGemeenteBerekeningen.tGemeente_Scope3_versie2025.csv bLISA.tGemeente_Banen_sbi8411.csv bLISA.tGemeente_Banen_SectorO.csv bRepubliq.tBNG_Gemeente_Energieverbruik_versie2025.csv	\Werkmap\Gemeenten\d. Data voor SQL
250925_BNG_Gemeente_2018_versie2025.ipynb 250925_BNG_Gemeente_loans_2023_versie2025.ipynb 250925_BNG_Gemeente_loans_2023_versie2025.ipynb	\Werkmap\Gemeenten\e. SQL notebooks\BNG
250930 pBNG.tGemeente_2018_Ratio_Lening_Passiva_versie2025.xlsx 250930 pBNG.tGemeente_2018_IndividueleKlanten_versie2025.xslx	\Werkmap\Gemeenten\f2. Data uit SQL BNG

[35] PCAF (2022). The Global GHG Accounting and Reporting Standard Part A: Financed Emissions. Second edition.

250930 pBNG.tGemeente_2018_CO2voetafdruk_Relatief_Totaal_versie2025.xlsx 250930 pBNG.tGemeente_2018_CO2voetafdruk_Absoluut_Totaal_versie2025.xlsx 250930 pBNG.tGemeente_2023_Ratio_Lening_Passiva_Loans_versie2025.xlsx 250930 pBNG.tGemeente_2023_IndividueleKlanten_Loans_versie2025.xlsx 250930 pBNG.tGemeente_2023_CO2voetafdruk_Relatief_Totaal_Loans_versie2025.xlsx 250930 pBNG.tGemeente_2023_CO2voetafdruk_Absoluut_Totaal_Loans_versie2025.xlsx 251019 pBNG.tGemeente_2024_Ratio_Lening_Passiva_Loans_versie2025.xlsx 251019 pBNG.tGemeente_2024_IndividueleKlanten_Loans_versie2025.xlsx 251019 pBNG.tGemeente_2024_CO2voetafdruk_Relatief_Totaal_Loans_versie2025.xlsx 251019 pBNG.tGemeente_2024_CO2voetafdruk_Absoluut_Totaal_Loans_versie2025.xlsx	

6.2.2 Scope 3

General factsheet scope 3

Scopes covered

Scope 3 covers all indirect GHG emissions except for the indirect GHG emissions that are already covered in scope 2. Scope 3 emissions per municipality are not known but can be estimated by using a spend-based method based on the annual spending of municipalities (IV3/COFOG; classification of the function of government).

Portfolio covered

Data are collected for all municipalities in the Netherlands. This means that the coverage ratio for this sector is 100%.

Data

The data on municipal expenditure (IV3 data) come from the Dutch Central Bureau of Statistics (CBS). The data come directly from the municipalities themselves. Municipalities deliver the data directly to CBS in a uniform, prescribed format. CBS does not check or edit the data.

The OECD has developed the Classification of the Function of Government (COFOG), a system that categorises government expenditure data from the System of National Accounts according to the specific purposes for which funds are allocated. Municipal budgets are divided into 9 main task fields (first level) and 48 tasks (second level).

The tasks indicate the purpose of the expenditure. The following main task fields are included: management and support; safety; traffic, transport and water management; economy; education; sport, culture and recreation; social domain; public health and environment; public housing, spatial planning and urban renewal.

The expenditures are also classified by economic categories. These categories indicate the type of expenditure. The following categories are included: salaries and social charges; taxes; goods and services; transfers; interest and dividends; financial transactions; settlements.

Data about the International Standard Industrial Classification of All Economic Activities (ISIC Rev. 3) were used to link the 17 sectors from the PCAF database to the different task fields and tangible assets of municipalities (see Calculation steps in this factsheet for more information).

The emission factors from the PCAF database need to be corrected for inflation. The emission factor has been adjusted using the inflation index for the Netherlands from the PCAF database.

Grid emission factors

No emission factors have been used from Appendix A. A database of emission factors that is often used for a spend-based method is the EXIOBASE database. These emission factors are also available in the PCAF database (March 2024) which were derived from EXIOBASE v3.9. For 17 sectors, the PCAF database provides an emission factor based on tCO_2e per million euro revenue. Emission factors are available per country and region (EU member states). PCAF recommends using the regional emission factors as it is more accurate than country emission factors. In the PCAF database, the emission factors are only available for the year 2019. Emission factors are corrected for inflation from 2019 to 2018, 2023 and 2024 using an inflation factor for the Netherlands.

Calculation steps

For the scope 3 calculation, a selection of relevant task fields per economic subcategory and relevant tangible assets was made. Only those task fields, subeconomic categories and tangible assets relevant for GHG emissions were selected.

The following subeconomic categories were selected:

- Durable goods
- Other goods and services

Two economic subcategories were included in the scope 3 calculations: 3.2 purchases of sustainable goods and services and 3.8 purchases of other goods and services. Within the economic subcategories the following task fields are relevant for the calculation of GHG emissions:

The letter between brackets corresponds to a sector in the International Standard Industrial Classification of All Economic Activities (ISIC Rev. 3). According to the detailed description of the task fields and tangible assets, the most appropriate production sector(s) has/have been linked.

- 2.1 Traffic and transport: this includes the maintenance of roads, squares, cycle paths, bridges and tunnels. Also includes street cleaning. This is related to Construction (F).
- 2.4 Commercial harbours and waterways: this includes work such as dredging, but also maintenance of shorelines and ice control on the water. This is related to Construction (F).
- 2.5 Public transport: this includes mainly a financial contribution to the province for public transport, but also major infrastructure facilities. In the case of large municipalities, this includes own public transport such as trams or metro. This is related to a combination of Construction (F), Transport equipment (D34-35), Transport (I).
- 3.2 Physical business infrastructure: this includes the maintenance of roads in business parks. This includes contributions to activities aimed at creating physical conditions for all forms of business activity, including maintenance of facilities. This is related to Construction (F).
- 5.7 Public green areas and (outdoor) recreation: this item includes the maintenance of natural areas and waterways. It includes the cost of maintaining green areas and playgrounds. This is related to Other services (O).
- 7.2 Sewerage: this item includes the maintenance of sewers, but also the prevention of groundwater problems and the treatment of wastewater. This is related to Other services (O).

- 7.3 Waste: this includes the collection and processing of commercial and household waste. It also includes activities such as waste separation. This is related to Other services (O).
- 7.4 Environmental management: this includes pest control, but also the protection and remediation of soil quality. It also includes activities such as noise control and radiation protection. This is related to Other services (O).
- 8.2 Land development (non-industrial sites): this relates to land for non-industrial sites. It includes the cost of responsibly preparing land for eventual residential development. This is related to Construction (F).

The iv3 data include seven items of tangible assets. Six of these were included in the scope 3 calculation: only the item Land (A121) was not included. This item only covers purchase of (bare) land, without buildings. Therefore, this item was not relevant for this calculation. The other items concern the purchase of buildings (both residential and non-residential), the construction of new buildings, the purchase of machinery, means of transport and public roads. These items are relevant for the calculation of GHG emissions and are therefore included.

The following tangible assets are relevant for the calculation of GHG emissions:

- Housing (A122), Commercial Buildings (A123) and Land, civil engineering works (A124) all relate to Construction (F). They include the purchase of residential properties as well as commercial buildings such as offices and construction work such as the construction of a bridge.
- Transportation equipment (A125) is related to Transport equipment (D34/35). This includes the purchase of, for example, bicycles and (company) cars.
- Machinery, equipment and installations (A126) covers purchases of items such as computers and printers, among other things. This item is related to Electrical & machinery (D29/33).
- The item Others (A129) is related to Other services (O).

After the task fields and tangible assets were linked to an ISIC code, the corresponding emission factor from the PCAF database was selected. The expenditures in the IV3 data for the mentioned task fields per economic subcategory and for the mentioned tangible assets were multiplied by 1,000 to have the expenditures in euro. Then, these expenditures were multiplied with the emission factor corrected for the inflation index for a particular year (2018, 2023 or 2024). For those task fields where multiple sectors are involved, one composite emission factor is created based on an equal distribution of the different sectors. For example, when three sectors are involved, the emission factor used for the calculation consists of one third of the individual emission factor per sector. For each municipality, the calculated tCO_2e emissions per item were added up to result in tCO_2e per municipality.

After calculating scope 3 GHG emissions, the GHG emissions were multiplied by the ratio of outstanding loan to total balance sheet ratio per client. For example, if the ratio of outstanding loans to total balance sheet is 25%, 25% of the social housing association's scope 1 and 2 GHG emissions are attributed to BNG. The financed GHG emissions per client are added up to result in the total financed GHG emissions per sector.

The financed GHG emissions and relative financed emissions are reported per scope. The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume in million euro of the clients for which a GHG footprint was calculated in this report.

Avoided emissions

Not applicable

Asset class specific considerations

The approach for municipalities is in line with the public loan approach in the PCAF methodology.

Attribution

To calculate the GHG footprint according to the PCAF principles, a general approach has been developed. First, the GHG emissions of the different entities in the sector are calculated. Then, the BNG's share of the total balance sheet is used to determine the share of GHG emissions for which BNG is responsible.

$$\sum \boldsymbol{CO_2eq} \times \frac{\boldsymbol{Outstanding\ loan\ volume}}{\boldsymbol{Total\ balance\ sheet\ (equity + debt)}}$$

Finally, the individual scopes and the sum of the scopes of all individual organisations have been aggregated.

Limitations

The spend-based method was used to calculate Scope 3 for municipalities. The spend-based method calculates GHG emissions based on an organisation's expenditure. A database with emission factors that are often used for a spend-based method is the EXIOBASE database. These emission factors are also available in the PCAF database. The unit of the emission factor is tCO_2e/million euro. The emission factors are available per country, but PCAF recommends using the region emission factors as it is more accurate than country emission factors. In the PCAF database, the emission factors are only available for the year 2019. Emission factors are corrected for inflation from 2019 to 2018, 2023 and 2024 using an inflation factor for the Netherlands.

The spend-based method and the use of Dutch-level emission factors from 2019 are far from ideal. Apart from inflation, sustainable choices are often more expensive. As a result, expenditure is higher, and because expenditure is higher, the calculated GHG emissions are also higher under the spend-based method, while emissions are lower.

Data quality estimate

Data quality score 4. The PCAF database gives a quality score of 4 when emissions are calculated using an emission factor based on tCO_2e/million euro revenue.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data file mentioned in the factsheet below.

List of the calculation sheets	Location
251006 scope 3 gemeente 2024.xlsx	\Werkmap\Gemeenten\f4. Berekening BNG

7 Public sector: provinces

7.1 Results public sector: provinces

In 2024, the provinces account for a small share of BNG's loan portfolio, representing 0.6% of the total.

7.1.1 Coverage ratio and attribution

As in previous years, the coverage ratio of provinces is 100%. Between 2023 and 2024, the outstanding loan volume has increased by 134 million euro. The total balance sheet of clients for which a GHG footprint was calculated also increased. As a result, the ratio of the loan portfolio to the total balance sheet has slightly decreased compared to last year. For 2018, 2023 and 2024, the loan portfolio, the total balance sheet and the coverage ratio are shown in Table 7-1.

Table 7-1 Loan portfolio, coverage ratio and ratio loan portfolio versus total balance sheet for the provinces in 2018, 2023 and 2024

Year	Total loan portfolio (million euro)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)	Coverage ratio of total loan portfolio (%)	Total balance sheet of clients for which a GHG footprint was calculated (million euro)	Ratio loan portfolio / total balance sheet of clients for which a GHG footprint was calculated*
2018	137	0.2	137	100.0	8,390	0.02
2023	449	0.5	449	100.0	4,392	0.10
2024	584	0.6	584	100.0	6,397	0.09

7.1.2 Energy consumption and financed GHG emissions

Table 7-2 shows the estimated total energy consumption of the provinces that are clients of BNG. Both natural gas consumption and electricity consumption increased between 2023 and 2024. This is primarily due to the addition of a new client. The emission factors for natural gas and electricity (unknown source) decreased. These changes affect GHG emissions. Given the sector’s small client base, each individual client can have a substantial impact on overall performance and outcomes.

Table 7-2 Total energy consumption of provinces in 2018, 2023 and 2024

Year	Natural gas consumption (m^3)	Electricity consumption (kWh)
2018	2,288,722	27,864,912
2023	797,107	14,938,557
2024	1,051,950	24,231,699

Table 7-3 shows the calculated GHG footprint results for the provinces in 2018, 2023, and 2024.

Table 7-3 Absolute and relative financed GHG emissions for the provinces in 2018, 2023 and 2024

Source of emissions	Scopes	Financed GHG emissions (tCO_2e/year)			Financed GHG emissions (%)			Relative financed GHG emissions (tCO_2e/million euro)		
		2018	2023	2024	2018	2023	2024	2018	2023	2024
Natural gas	1	93	159	170	1.1	1.3	0.9	0.7	0.4	0.3
Fossil fuel (cars)	1	7	15	21	0.1	0.1	0.1	0.1	0.0	0.0
Electricity	2	345	547	688	4.0	4.4	3.6	2.5	1.2	1.2
Purchased goods and services	3	8,258	11,825	18,441	94.9	94.2	95.5	60.4	26.3	31.6
Total	**1-2-3**	**8,703**	**12,546**	**19,320**	**100.0***	**100.0***	**100.0***	**63.6**	**27.9**	**33.1**
Total	**1-2**	**445**	**721**	**879**	**5.1**	**5.8**	**4.5**	**3.3**	**1.6**	**1.5**

*The sum in these columns is not always exactly 100% due to rounding per sector

Due to the addition of one new client, energy consumption is higher in 2024 than in 2023 (Table 7-2), as well as the financed GHG emissions (Table 7-3). The ratio of the loan portfolio to total balance sheet is slightly lower in 2024 than in 2023 (Table 7-1).

Between 2023 and 2024, the absolute financed GHG emissions increased for all three scopes. In total, the financed GHG emissions increased by 6,774 tonnes. This increase is mainly due to an increase in Scope 3 (6,616 tonnes). Besides the addition of a client, this is attributable to the increase in total expenditure on procurement of goods and services between 2023 and 2024.

The relative financed GHG emissions increased by 5.2 tonnes per million euro. For both Scope 1 and 2 the relative financed emissions stayed similar for fossil fuel use and electricity use but slightly decreased in 2024 in comparison to 2023 for natural gas use (Table 7-3). The financed GHG emissions for Scope 3 increased and

influenced both the total absolute (>90%) and total relative GHG emissions. Because the data quality of Scope 3 is poor (score 4), no hard conclusions can be drawn from these figures.

7.2 Public sector: provinces approach

The method to calculate scope 3 for provinces is almost the same as the method to calculate scope 3 for municipalities. For details about this approach see section 6.2.2. For the differences in calculation methodology between province and municipality, see the calculation steps in the general factsheet below.

General factsheet

Scopes covered

For provinces, scope 1 natural gas consumption, scope 1 fossil fuel use by company cars, scope 2 electricity consumption and scope 3 purchased goods and services are covered.

Scope 1 emissions include the direct GHG emissions of the organisation. For provinces, these emissions result from the use of natural gas for heating buildings and the use of fossil fuels for cars. The exact figures for these sources are not known for each province, so estimates were made using several calculation steps to obtain the best possible result.

Scope 2 emissions include the indirect GHG emissions from the consumption of purchased electricity, heat or steam. The use of heat and steam per province is not known, so scope 2 only includes the use of purchased electricity. As the exact numbers per province are not known, estimates were made using several calculation steps.

Scope 3 covers all indirect GHG emissions except for the indirect GHG emissions that are already covered in scope 2. Scope 3 emissions per province are not known but can be estimated by using a spend-based method based on the annual spending of provinces (IV3/COFOG; classification of the function of government).

Portfolio covered

Data are collected for all provinces that are client at BNG. This means that the coverage for this sector is 100%.

Data

For scope 1 natural gas consumption and scope 2 electricity consumption, 2024 data were used. For scope 1 fossil fuel consumption of company cars, the calculation was made with partial use of 2023 data.

The data used in this approach comes from several sources.

For provinces energy data and the litres of fuel consumed or driven kilometres by company cars are not available per province. Therefore, calculations are performed based on several data sources to estimate the GHG emissions due to natural gas use, electricity use, and the use of company cars. Data used for these calculations are summarised here and the used calculations are explained below at the section calculation steps.

Data on the number of employees working for SBI-code 8411 (general government administration, which includes municipalities, provinces and ministries) and data on the number of employees working for the entire public administration and government services sector comes from Lisa. Lisa serves as the national information system on jobs in the Netherlands and contains a comprehensive database with information on all places where paid work is performed.

Data on the number of employees working for the provincial government organisation come from 'A&O fonds provincies'. ‘A&O fonds provincies' is an organisation that provides governments with practical tools, knowledge and subsidies. These data are available at the aggregated level of the provinces.

The source of the data on the supply of energy to the public administration and government services sector is Statistics Netherlands (CBS). The data covers the supply of electricity and natural gas to enterprises and other public buildings. The data are based on the energy network connection register and are therefore reliable. Data are on sector and region level.

Data on the number of passenger cars owned by enterprises per sector come from the Dutch Central Bureau of Statistics (CBS). The data originate from the vehicle register (RDW), which ensures their reliability and accuracy.

Data on the number of kilometres travelled by car per year comes from the Dutch Central Bureau of Statistics (CBS) and covers the average number of kilometres travelled per year by a passenger car registered in the Netherlands. The original data comes from the RDW's Online Kilometre Registration (OKR), which ensures its reliability.

Data on provincial expenditure (IV3 data) come from the Dutch Central Bureau of Statistics (CBS). The data come directly from the provinces themselves. Provinces deliver the data directly to CBS in a uniform, prescribed format. CBS does not check or edit the data.

The OECD has developed the Classification of the Function of Government (COFOG), a system that categorises government expenditure data from the System of National Accounts according to the specific purposes for which funds are allocated. Provincial expenditures are divided into task fields.

The tasks indicate the purpose of the expenditure. The following main task fields are included: general resources, governance, traffic and transport, water, environment, nature, regional economics, culture and society, space.

The expenditures are also classified by economic categories. These categories indicate the type of expenditure. The following categories are included: salaries and social charges; taxes; goods and services; transfers; interest and dividends; financial transactions; settlements.

Data about the International Standard Industrial Classification of All Economic Activities (ISIC Rev. 3) were used to link the 17 sectors from the PCAF database to the different task fields and tangible assets of provinces.

The emission factor has been adjusted using the inflation index for the Netherlands from the PCAF database, in order to express it in real terms.

Grid emission factors

Appendix A contains more information on emission factors.

The following emission factors from Appendix A have been used:

- Natural gas
- Electricity (unknown source)
- Passenger transport, Car, Fuel type unknown, Weight class unknown.

For scope 3 no emission factors have been used from Appendix A.

A database of emission factors that is often used for a spend-based method is the EXIOBASE database. These emission factors are also available in the PCAF database (March 2024) which were derived from EXIOBASE v3.9. For 17 sectors, the PCAF database provides an emission factor based on tCO_2e per million euro revenue. Emission factors are available per country and region (EU member states). PCAF recommends using the regional emission factors as it is more accurate than country emission factors. In the PCAF database, the emission factors are only available for the year 2019. Emission factors are corrected for inflation from 2019 to 2018, 2023 and 2024 using an inflation factor for the Netherlands.

Calculation steps

Scope 1 natural gas and scope 2 electricity

For the public administration and government services sector, the supply of natural gas and electricity is known (CBS) at the aggregated level of provinces and includes both provinces and other governmental authorities, such as municipalities.

To calculate scopes 1 and 2 for the provinces, several calculation steps were taken. The number of employees working for the total public administration and government services sector is known at the level of the province (Lisa), as well as the number of employees working for the province as an organisation (A&O fonds Provincies).

The supply of natural gas and electricity to the public administration and government services sector is known for each province (CBS). The percentage of the number of employees working for each provincial organisation (A&O fonds Provincies) relative to the number of employees working for the total public administration and government services sector in each province (Lisa) was multiplied by the supply of natural gas and electricity to the public administration and government services sector (CBS).

This results in the supply of natural gas and electricity to the province as an organisation. The amount of natural gas was multiplied by the emission factor for natural gas (Appendix A) and the amount of electricity was multiplied by the emission factor for electricity (unknown source; Appendix A). The amount of GHG emissions was divided by a factor of 1,000 to obtain tonnes of GHG emissions for scope 1 (natural gas) and scope 2 (electricity).

Scope 1 fossil fuel for company cars

Scope 1 emissions also include fossil fuel emissions from company cars. For this calculation, the number of employees working for the total public administration and government services sector at the province level (Lisa) and the number of employees working for the provincial organisation (A&O Fonds Provincies) were used.

The number of company cars used in the total public administration and government services sector is known (CBS Statline). To calculate the total number of company cars for the provinces, the number of company cars used by the total public administration and government services sector was multiplied by the percentage of employees working at provinces relative to all employees working for the Dutch public administration and government services.

To obtain the number of company cars per province the total number of company cars for Dutch provinces was multiplied by the percentage of employees working for the province in relation to all employees working for Dutch provinces. This was multiplied by the number of kilometres travelled per company car (all fuel types) and multiplied by the emission factor for passenger transport, car, fuel type unknown, weight class unknown (Appendix A). The GHG emissions were divided by a factor of 1,000 to obtain the GHG emissions in tonnes for company cars.

After calculating scopes 1 and 2 GHG emissions, these GHG emissions were multiplied by the ratio of outstanding loan to total balance sheet ratio per client. For example, if the ratio of outstanding loan to total balance sheet is 25%, 25% of the provinces' scope 1 and 2 GHG emissions are attributed to BNG. The financed GHG emissions per client are added up to result in the total financed GHG emissions per sector.

The financed GHG emissions and relative financed GHG emissions are reported per scope. The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume in million euro of the clients for which a GHG footprint was calculated in this report.

Scope 3 are all indirect GHG emissions except for the indirect GHG emissions that are already covered in scope 2. With a few exceptions, the calculation method for scope 3 provinces is the same as for scope 3 municipalities.

For the scope 3 calculation, a selection of relevant task fields per economic subcategory and relevant tangible assets was made. Only those task fields, subeconomic categories and tangible assets relevant for GHG emissions were selected. For provinces the same economic subcategories and tangible assets were included in the calculation as for municipalities. However, the task fields are different than those of the municipalities.

Within the economic subcategories the following task fields are relevant for the calculation of GHG emissions:

The letter between brackets corresponds to a sector in the International Standard Industrial Classification of All Economic Activities (ISIC Rev. 3). According to the detailed description of the task fields and tangible assets, the most appropriate production sector(s) has/have been linked.

- 2.1 Land roads: this includes the management and maintenance of land roads. Other activities under this heading include traffic surveys, ice control, road marking, and installation of traffic control devices. This is related to Construction (F).
- 2.2 Waterways: this covers the construction, management and maintenance of waterways. It includes items such as dredging, shoreline maintenance, construction and replacement of waterway structures. This is related to Construction (F).
- 2.3 Public Transportation: this includes all activities related to public transport, such as trains, trams, metros, buses, boats, and ferries. This is related to a combination of Construction (F), Transport equipment (D34-35), and Transport (I).

- 4.1 Soil Protection: Includes costs related to soil protection measures and soil decontamination. This is related to Other community, social and personal service activities (O).
- 5.2 Management of natural areas: this item includes activities related to nature management and the protection of nature and landscapes. This is related to Other community, social and personal service activities (O).
- 5.3 Management of flora and fauna: this item includes control of invasive exotic species and management of goose damage. This is related to Other community, social and personal service activities (O).

For further details see the general factsheet of scope 3 municipalities.

Avoided emissions

The CBS table on supply of natural gas and electricity through public grit, states the following:

This table gives figures for electricity and gas supplied to enterprises and other commercial buildings. This includes supply via the public grid, including supply from the public grid to the company's own grid. Electricity produced by enterprises for their own consumption is therefore not included in these figures.

If a province invests in renewable electricity, it will reduce the amount of electricity it consumes from the grid. Indirectly, therefore, investments in renewable electricity should be reflected in a reduction of scope 2 electricity in this report.

Asset class specific considerations

The approach for provinces is in line with the public loan approach in the PCAF methodology.

Attribution

To calculate the GHG footprint according to the PCAF principles, a general approach has been developed. First, the GHG emissions of the different entities in the sector are calculated. Then, the BNG's share of the total balance sheet is used to determine the share of GHG emissions for which BNG is responsible.

$$\sum \boldsymbol{CO_2eq} \times \frac{\boldsymbol{Outstanding\ loan\ volume}}{\boldsymbol{Total\ balance\ sheet\ (equity + debt)}}$$

Finally, the individual scopes and the sum of the scopes of all individual organisations have been aggregated.

Absolute vs. relative emissions

For the provinces, the total financed GHG emissions were calculated in tonnes.

The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume of the clients for which a GHG footprint was calculated in this report.

Limitations

Scope 1 natural gas use and scope 2 electricity use

The actual natural gas - and electricity consumption by provinces as an organisation are not known. It is therefore calculated according to the estimated number of employees working for the province and the total number of employees working for the whole public administration and government services sector per province.

Scope 1 fossil fuel by company cars

There is no recorded data per province on company cars, including details such as number of cars, car types and fuel types. The best possible result is achieved by using the current model(s). Many provinces are actively working to improve the sustainability of their operations. As part of this effort, they are focusing on making their vehicle fleets more sustainable. The calculation method used in this project does not reflect this development. As a result, the GHG emissions from company cars are a relatively rough estimate and may differ from the actual situation due to developments in making the local authority fleet more sustainable. In addition to cars, provinces also have other means of transport such as scooters and (electric) bicycles. The use of these means of transport is not included in the calculated GHG emissions for company cars.

Scope 3

For scope 3 limitations see limitations scope 3 municipalities.

Data quality estimate

Scope 1 natural gas and scope 2 electricity

Data quality score 4. The GHG emissions are calculated based on the energy supply to the public administration and government services sector at the aggregated level of provinces. This includes not only the energy supply to the provinces, but also to other government authorities such as municipalities. Therefore, the data are used based on region and the data quality score is 4.

Scope 1 company cars

Data quality score 5. The GHG emissions are calculated based on average car information. Brand, model, and type are not known and distance travelled is based on local or regional data. See option 3b in Table 5-16 on page 106 of the PCAF report (2022)[36]. Therefore, the data quality score is 5.

Scope 3

Data quality score 4. The PCAF database gives a quality score of 4 when emissions are calculated using an emission factor based on tCO_2e/million euro revenue.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data files mentioned in the factsheet below.

List of the calculation sheets	Location
251101_bewerking passiva provincie 2018_2021_2022_2024.xlsx 251105_BewerkingAardgasElektra.xlsx	\Werkmap\Provincies\c. Voorbewerkte data
bAenO.tProvincie_BanenbijProvincie.csv bBNG.tProvincie_Leningportefeuille.csv bCBSstatline.tAardgasElektraProvincie.csv bLISA.tProvincie_Banen_SectorO.csv bProvincieBerekeningen.tProvincie_Scope3_versie2025.csv bCBSstatline.tProvincie_Passiva.csv	\Werkmap\Provincies\d. Data voor SQL
251105_BNG_Provincie_2024_versie2025.ipynb	\Werkmap\Provincies\e. SQL notebooks
251006 provincie berekening scope 3 2024.xlsx	\Werkmap\Provincies\f4. Berekening BNG
251112_pBNG.tProvincie_2024_CO2voetafdruk_Absoluut_Totaal_versie2025.xlsx 251112_pBNG.tProvincie_2024_CO2voetafdruk_Relatief_Totaal_versie2025.xlsx 251112_pBNG.tProvincie_2024_IndividueleKlanten_versie2025.xlsx 251112_pBNG.tProvincie_2024_Ratio_Lening_Passiva_versie2025.xlsx	\Werkmap\Provincies\f2. Data uit SQL BNG

[36] PCAF (2022). The Global GHG Accounting and Reporting Standard Part A: Financed Emissions. Second edition..

8 Public sector: water boards

8.1 Results public sector: water boards

In 2024, the water boards account for a small share of BNG's loan portfolio, representing only 0.3%.

8.1.1 Coverage ratio and attribution

The coverage ratio for water boards is 100%, as for previous years. Between 2023 and 2024 the outstanding loan volume increased by 17 million euro. The total balance sheet of clients decreased by 1,002 million euro. As a result, the ratio of the loan portfolio to the total balance sheet increased meaning that the attribution to BNG increased compared to last year. For 2018, 2023 and 2024, the loan portfolio, the total balance sheet and the coverage ratio are shown in Table 8-1.

Table 8-1 Loan portfolio, coverage ratio and ratio loan portfolio versus total balance sheet for the water boards in 2018, 2023 and 2024

Year	Total loan portfolio (million euro)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)	Coverage ratio of total loan portfolio (%)	Total balance sheet of clients for which a GHG footprint was calculated (million euro)	Ratio loan portfolio / total balance sheet of clients for which a GHG footprint was calculated
2018	233	0.3	233	100	5,122	0.05
2023	220	0.3	220	100	5,960	0.04
2024	237	0.3	237	100	4,958	0.05

8.1.2 Financed GHG emissions

Table 8-2 shows the calculated GHG footprint results for water boards in 2018, 2023 and 2024.

Table 8-2 Absolute and relative financed GHG emissions for the water boards in 2018, 2023 and 2024
- means no data are available

Systems	Source of emissions	Scopes	Financed GHG emissions (tCO_2e/year)			Financed GHG emissions (%)			Relative financed GHG emissions (tCO_2e/million euro)		
			2018	2023	2024	2018	2023	2024	2018	2023	2024
Water treatment management	Natural gas	1	111	47	44	0.3	0.3	0.3	0.5	0.2	0.2
	Other fuels	1	50	4	4	0.1	0.0	0.0	0.2	0.0	0.0
Water systems	Natural gas	1	30	19	9	0.1	0.1	0.1	0.1	0.1	0.0
	Other fuels	1	111	35	26	0.3	0.2	0.2	0.5	0.2	0.1
Other	Natural gas	1	50	41	35	0.1	0.3	0.2	0.2	0.2	0.1
	Other fuels	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
-	Own mobility, transport and maintenance	1	502	145	141	1.5	1.0	0.9	2.2	0.7	0.6
-	GHG sewage treatment plant	1	17,139	11,280	11,976	50.9	79.4	76.2	73.5	51.3	50.5
Water treatment management^	Electricity	2	12,291	690	1,274	36.5	4.9	8.1	52.7	3.1	5.4
	Heat	2	70	43	40	0.2	0.3	0.3	0.3	0.2	0.2
Water systems^	Electricity	2	-	73	119	0.0	0.5	0.8	0.0	0.3	0.5
	Heat	2	-	0	0	0.0	0.0	0.0	0.0	0.0	0.0
Other^	Electricity	2	-	10	23	0.0	0.1	0.1	0.0	0.0	0.1
	Heat	2	-	3	2	0.0	0.0	0.0	0.0	0.0	0.0
-	Own mobility, transport and maintenance#	2	-	3	3	0.0	0.0	0.0	0.0	0.0	0.0
-	Commuting	3	484	222	214	1.4	1.6	1.4	2.1	1.0	0.9
-	Outsourced transport and maintenance	3	1,377	704	906	4.1	5.0	5.8	5.9	3.2	3.8
-	Materials and raw materials	3	1,462	895	894	4.3	6.3	5.7	6.3	4.1	3.8
-	**Total**	**1-2-3**	**33,677**	**14,214**	**15,710**	**100.0***	**100.0***	**100.0***	**144.4**	**64.6**	**66.2**
-	**Total**	**1-2**	**30,354**	**12,393**	**13,696**	**90.1**	**87.2**	**87.2**	**130.2**	**56.3**	**57.7**

^For 2018 the indirect GHG emissions for water treatment management, water systems, and other within scope 2 are reported as one value under Water treatment management electricity and heat.

#Own mobility, transport, and maintenance were not in the data of 2018.

*The sum in these columns is not always exactly 100% due to rounding per sector.

Between 2023 and 2024 the absolute GHG emissions decreased for the following segments in scope 1: 'water treatment management', 'water systems', 'other segments' and 'own mobility, transport and maintenance'. For scope 2, the segments 'heat of water treatment management' and 'heat of other segments' decreased. For scope 3, the segments 'Commuting' and 'Materials and raw materials' decreased. However, for all scopes the absolute GHG emissions increased resulting in a total increase of 1,496 tonnes. For scope 1 the segment that contributes most to this increase is 'GHG sewage treatment plant'. Despite efforts taken by water authorities to achieve reductions in both methane and nitrous oxide emissions, an increase was established[37]. For scope 2 the segment 'electricity of water treatment management' increased.

The total relative financed GHG emissions increased from 64.6 to 66.2 tonnes per million euro. Scope 2 shows the biggest increase in relative financed GHG emissions. Just as for the increase in absolute emissions, the segment 'electricity of water treatment management' is the biggest contributing factor. However, not all scopes show an increase in relative financed GHG emissions. Scope 1 shows a decrease, suggesting that the absolute increase is partially caused by the attribution factor (ratio loan to total balance sheet).

The 'Klimaatmonitor Waterschappen, verslagjaar 2024' (Arcadis, 2025)[38] confirms ongoing progress in sustainable energy production and emissions management since 2018.

[37] Arcadis (2025). Klimaatmonitor Waterschappen Verslagjaar 2024 (Dutch article).
[38] Ibid.

8.2 Public sector: water boards' approach

8.2.1 Scopes 1, 2 and 3

The Klimaatmonitor waterschappen, verslagjaar 2024 (Arcadis, 2025)[39] forms the basis for the calculations of water boards. This monitor was developed by Arcadis for the Unie van Waterschappen and the NWB Bank. This monitor describes in detail the emissions per scope and per individual water board. The description of this approach is therefore brief. More information can be found in the 'klimaatmonitor waterschappen, verslagjaar 2024' (Arcadis, 2025)[40].

Adjustments in methodology

For the year 2023 some (minor) adjustments have been made in the numbers for some emission sources by Arcadis, resulting in a recalculation of the 2023 emissions. Methane and nitrous oxide numbers of 2023 has been finalised by the Central Bureau of Statistics. As a result, three emission sources changed for 2023 in comparison to last year calculations: GHG emission from the sewage plant (scope 1), outsourced transport and maintenance (scope 3) and materials and raw materials (scope 3).

Table 8-3 Effect of change in methodology on the GHG emissions in tCO_2e

Source of emissions	Scopes	New 2023	Previous 2023	Difference (%) * 2023
GHG sewage treatment plant	1	11,280	11,200	0.7
Outsourced transport, and maintenance	3	704	947	-25.7
Materials and raw materials	3	895	761	17.7

*The difference is calculated with the following formula: (New-Previous)/Previous*100

[39] Arcadis (2025). Klimaatmonitor Waterschappen Verslagjaar 2024 (Dutch article).

[40] Ibid.

General factsheet

Scopes covered

The report 'Klimaatmonitor waterschappen, verslagjaar 2024' (Arcadis, 2025)[41] covers all three scopes in detail. Table 8-4 shows the underlying themes of the scopes. All scopes presented by Arcadis in the report 'Klimaatmonitor Waterschappen, verslagjaar 2024' (Arcadis, 2025)[42] in Table 1 are also used for this report.

Table 8-4 The different scopes included in the water boards' approach

Direct or indirect emissions	Source of emissions	Scopes
Direct GHG emissions	Water treatment management	1
	Water systems	1
	Other	1
	Own mobility, transport and maintenance	1
	GHG emissions of the sewage treatment plant	1
Indirect GHG emissions	Water treatment management	2
	Water systems	2
	Other	2
	Own mobility, transport and maintenance	2
	Commuting	3
	Outsourced transport and maintenance	3
	Materials and raw materials	3

Portfolio covered

Data are collected for all 21 water boards in the Netherlands; the portfolio coverage ratio is 100%.

Data

Data were used from the report 'Klimaatmonitor Waterschappen, verslagjaar 2024' (Arcadis, 2025)[43]. This monitor was developed by Arcadis for the Union of Water Boards (Unie van Waterschappen) and NWB Bank. This monitor describes in detail the emissions in the three scopes for each individual water board.

[41] Ibid.

[42] Arcadis (2025). Klimaatmonitor Waterschappen Verslagjaar 2024 (Dutch article).

[43] Ibid.

For the report 'Klimaatmonitor Waterschappen, verslagjaar 2024' (Arcadis, 2025)[44] the calculations were made by using emission factors based on 'well to wheel' (WTW). The PCAF methodology prescribes the use of 'tank to wheel' (TTW) based emission factors. Therefore, Arcadis provided Het PON & Telos with the data from the 'Klimaatmonitor Waterschappen, verslagjaar 2024' (Arcadis, 2025)[45] calculated based on 'tank to wheel' (TTW) emission factors.

Arcadis obtained the data from the water boards by means of a questionnaire that collected both quantitative and qualitative data.

The data on the total balance sheet per water authority comes from the WAVES database and is provided to the Unie van Waterschappen by the water boards themselves.

Grid emission factors

The 'Klimaatmonitor waterschappen verslagjaar 2024' (Arcadis, 2025)[46] uses emission factors from www.CO2emissiefactoren.nl. The only difference is that the monitor uses the 'well to wheel' (WTW) factors, and not the 'tank to wheel' factors (TTW). The PCAF harmonised approach prescribes the use of the TTW values. Therefore, Arcadis has provided Het PON & Telos with the data from the 'Klimaatmonitor Waterschappen, verslagjaar 2024' (Arcadis, 2025)[47] calculated based on 'tank to wheel' (TTW) emission factors.

Calculation steps

The GHG emissions based on TTW emission factors were summed up to obtain the categories per scope that are shown in Table 8-4. The exact calculation steps per scope can be found in the Arcadis (2025) report.[48]

After calculating scopes 1, 2 and 3 GHG emissions, these GHG emissions were multiplied by the ratio of outstanding loan to total balance sheet ratio per client. For example, if the ratio of outstanding loans to total balance sheet is 25%, 25% of the water boards' scope 1 and 2 GHG emissions are attributed to BNG. The financed GHG emissions per client are added up to result in the total financed GHG emissions per sector.

The financed GHG emissions and relative financed emissions are reported per scope. The relative financed emissions in tCO_2e / million euro were calculated by

[44] Ibid.

[45] Ibid.

[46] Arcadis (2025). Klimaatmonitor Waterschappen Verslagjaar 2024 (Dutch article).

[47] Ibid.

[48] Ibid.

dividing the financed GHG emissions by the outstanding loan volume in million euro of the clients for which a GHG footprint was calculated in this report.

Avoided emissions

Data on renewable energy use per water board are available in the Arcadis (2025) report.[49]

Asset class specific considerations

The approach for water boards is in line with the public loan approach in the PCAF methodology.

Attribution

To calculate the GHG footprint according to the PCAF principles, a general approach has been developed. First, the GHG emissions of the different entities in the sector are calculated. Then, the BNG's share of the total balance sheet is used to determine the share of GHG emissions for which BNG is responsible.

$$\sum \boldsymbol{CO_2eq} \times \frac{\boldsymbol{Outstanding\ loan\ volume}}{\boldsymbol{Total\ balance\ sheet\ (equity + debt)}}$$

Finally, the individual scopes and the sum of the scopes of all individual organisations have been aggregated.

Absolute vs. relative emissions

For the water boards, the total financed GHG emissions were calculated in tonnes CO_2e.

The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume of the clients for which a GHG footprint was calculated in this report.

Limitations

Not all scope 3 emissions are yet monitored by the water boards.

Data quality estimate

The data quality score is 2, the GHG emissions are calculated based on data provided by the water boards themselves, but the data are not audited.

The data quality score for scope 1 GHG emissions from the sewage treatment plant is 3. The GHG emissions of methane and nitrous oxide from sewage treatment plants were calculated based on an IPCC model. This does not consider the

[49] Ibid.

individual situation of the sewage treatment plants. However, the data are sector specific.

Calculation sheets

The final overview of all the calculations for 2023 and 2024 can be found in the data files mentioned in the factsheet below.

List of the calculation sheets	Location
250915_Waterschappen_BNG_bank_verslagjaar2023.xlsx	Werkmap\Waterschappen\f4. Berekening BNG
250915_Waterschappen_BNG_bank_verslagjaar2024.xlsx	Werkmap\Waterschappen\f4. Berekening BNG

9 Public sector: joint arrangements

9.1 Results joint arrangements

The joint arrangements are a small sector within the loan portfolio of BNG. In 2024, the sector accounts for 1.4% of BNG's loan portfolio.

Tables 9-1 and 9-2 show the results for the joint arrangements in 2023 and 2024. The GHG footprint was calculated for 100% of the joint arrangements loan portfolio in 2024. Between 2023 and 2024, the outstanding loan volume decreased by 13 million euro. The loan portfolio of clients for which a GHG footprint was calculated decreased by 13 million euro as well.

Between 2023 and 2024, the financed GHG emissions decreased for all scopes. Total financed GHG emissions decreased by 6,118 tonnes. This decrease is mainly due to the decrease in scope 1 and 3. The decrease in loans of clients for which a GHG footprint was calculated and the decrease in financed GHG emissions, lead to a decrease in financed GHG emissions from 66.1 to 62.0 tonnes per million euro.

In conclusion, both the absolute and relative financed GHG emissions for the joined arrangements sector decreased between 2023 and 2024.

Table 9-1 Loan portfolio and coverage ratio of joint arrangements in 2023 and 2024

Year	Total loan portfolio (million euro)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)	Coverage ratio of total loan portfolio (%)
2023	1,303	1.5	1,303	100
2024	1,290	1.4	1,290	100

Table 9-2 Absolute and relative financed GHG emissions for joint arrangements in 2023 and 2024

Scopes	Financed GHG emissions (tCO_2e/year)		Financed GHG emissions (%)		Relative financed GHG emissions (tCO_2e/million euro)	
	2023	2024	2023	2024	2023	2024
1	28,911	26,827	33.5	33.5	22.2	20.8
2	4,547	4,217	5.3	5.3	3.5	3.3
3	52,717	49,014	61.2	61.2	40.4	38.0
Total	**86,175**	**80,058**	**100.0***	**100.0***	**66.1**	**62.0**

*The sum in these columns is not always exactly 100% due to rounding per sector

9.2 Joint arrangement approach

See for the joint arrangement approach the general factsheet and factsheets per data source in section 5.2 (Housing related approach). The coverage ratio for the joint arrangements is 100%. For the joint arrangements, the loans of this sector were selected from the loan portfolio of 31-12-2023 and 31-12-2024.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data file mentioned in the factsheet below.

List of the calculation sheets	Location
BNGDOCS-#3705647-v3-Totaaloverzicht berekende emissies door S&S _ Kredietportefeuille	\Werkmap\2_Data\2.1_Origineel met AVG\Leningportefeuille BNG\Berekeningen door BNG aangeleverd

10 Public sector: other public institutions

10.1 Results other public institutions

The other public institutions, such as libraries, are a small sector within the loan portfolio of BNG. In 2024, the sector accounts for 0.5% of BNG's loan portfolio.

Tables 10-1 and 10-2 show the results of the other public institutions in 2023 and 2024. The GHG footprint was calculated for 100% of the other public institutions loan portfolio in 2024. Between 2023 and 2024, the outstanding loan volume decreased by 17 million euro. The loan portfolio of clients for which a GHG footprint was calculated decreased by 17 million euro as well.

Between 2023 and 2024, the financed GHG emissions decreased for all scopes. Total financed GHG emissions decreased by 1,656 tonnes. This decrease is due to a decrease in all three scopes. The decrease in loans of clients for which a GHG footprint was calculated and the decrease in financed GHG emissions, lead to a decrease in financed GHG emissions from 62.7 to 61.5 tonnes per million euro.

In conclusion, both the absolute and relative financed GHG emissions for the other public institutions sector decreased between 2023 and 2024.

Table 10-1 Loan portfolio and coverage ratio of other public institutions in 2023 and 2024

Year	Total loan portfolio (million euro)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)	Coverage ratio of total loan portfolio (%)
2023	510	0.6	510	100
2024	493	0.5	493	100

Table 10-2 Absolute and relative financed GHG emissions for other public institutions in 2023 and 2024

Scopes	Financed GHG emissions (tCO_2e/year)		Financed GHG emissions (%)		Relative financed GHG emissions (tCO_2e/million euro)	
	2023	2024	2023	2024	2023	2024
1	10,522	9,990	32.9	32.9	20.6	20.2
2	1,812	1,717	5.7	5.7	3.6	3.5
3	19,674	18,645	61.5	61.4	38.6	37.8
Total	**32,008**	**30,352**	**100.0***	**100.0***	**62.7**	**61.5**

*The sum in these columns is not always exactly 100% due to rounding per sector

10.2 Other public institutions approach

See for the other public institutions approach the general factsheet and factsheets per data source in section 5.2 (Housing related approach). The coverage ratio for the other public institutions is 100%. For the other public institutions, the loans of this sector were selected from the loan portfolio of 31-12-2023 and 31-12-2024.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data file mentioned in the factsheet below.

List of the calculation sheets	Location
BNGDOCS-#3705647-v3-Totaaloverzicht berekende emissies door S&S _ Kredietportefeuille	\Werkmap\2_Data\2.1_Origineel met AVG\Leningportefeuille BNG\Berekeningen door BNG aangeleverd

11 Healthcare sector

11.1 Results healthcare sector

In 2024, the healthcare sector accounts for 6.9% of the BNG's total loan portfolio.

11.1.1 Coverage ratio and attribution

Between 2023 and 2024, the outstanding loan volume of BNG in the healthcare sector decreased by 300 million euro. Because of this decrease in outstanding loan volume and a coverage ratio of 99.7%, the loan portfolio of clients for which a GHG footprint was calculated decreased by 319 million euro. The total balance sheet of clients for which a GHG footprint was calculated also decreased. As a result, the ratio of the loan portfolio to the total balance sheet remained stable compared to last year, which means that the attribution to BNG remained largely stable. For 2018, 2023 and 2024, the loan portfolio, the total balance sheet and the coverage ratio are shown in Table 11-1.

Table 11-1 Loan portfolio, coverage ratio and ratio loan portfolio versus total balance sheet for the healthcare sector in 2018, 2023 and 2024

Year	Total loan portfolio (million euro)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)	Coverage ratio of total loan portfolio (%)	Total balance sheet of clients for which a GHG footprint was calculated (million euro)	Ratio loan portfolio / total balance sheet of clients for which a GHG footprint was calculated^
2018	7,031	8.6	6,167	87.7	42,209	0.15
2023	6,629	7.6	6,629	100.0	56,614*	0.12*
2024	6,329	6.9	6,310	99.7	51,856#	0.12#

^In 2023 and 2024, the total balance sheets for 11 and 12 healthcare institutions, respectively, were unavailable. For these institutions, a loan-to-balance-sheet ratio was calculated using the average loan-to balance sheet ratio of the other institutions. An average ratio of 0.14 was applied for 2023, and 0.14 for 2024.

*In 2023, 1.4% of the loan portfolio is excluded from this figure, as the GHG emissions were calculated using a less precise method rather than based on energy consumption.

#In 2024, 1.0% of the loan portfolio is excluded from this figure, as the GHG emissions were calculated using a less precise method rather than based on energy onsumption.

11.1.2 Energy consumption and financed GHG emissions

The total energy consumption of the healthcare sector in 2018, 2023 and 2024 is shown in Table 11-2. Due to different sets of clients and changes in the methodology in 2024, the data for the different years are not directly comparable (for an explanation, see section 11.2.1).

Table 11-2 shows the total energy consumption of the healthcare sector in 2018, 2023 and 2024. However, to enable comparison across years, the natural gas and electricity consumption for the 2018 and 2023 loan portfolios have been recalculated using the current methodology (see section 11.2.1). These recalculated values are not included in the table below. According to the new method, the estimated natural gas consumption was 303,124,055 m^3 in 2018 and 287,988,032 m^3 in 2023, while the estimated electricity consumption was 1,689,101,762 kWh in 2018 and 1,675,225,146 kWh in 2023. Although these recalculated figures for natural gas consumption still indicate a decline, the reduction is less pronounced than what Table 11-2 suggests.

Table 11-2 Total energy consumption of the healthcare sector in 2018, 2023 and 2024

Year	Natural gas consumption (m^3)	Electricity consumption (kWh)
2018	583,236,160	1,302,739,082
2023*	531,745,272	1,324,961,406
2024#	239,000,224^	1,671,754,459^

* In 2023, 1.4% of the loan portfolio is excluded from this figure, as the GHG emissions were calculated using a less precise method rather than based on energy consumption.

In 2024, 1.0% of the loan portfolio is excluded from this figure, as the GHG emissions were calculated using a less precise method rather than based on energy consumption.

^ In 2024, natural gas and electricity consumption are calculated using a different methodology. Therefore, 2024 figures cannot be compared directly with previous years.

Table 11-3 shows the calculated GHG footprint results for the healthcare sector in 2018, 2023 and 2024. The emission factors for natural gas and electricity (unknown source) decreased. The attribution to BNG remained stable. Both affect GHG emissions.

Table 11-3 Absolute and relative financed GHG emissions for the healthcare sector in 2018, 2023 and 2024. - means no data are available

Source of emissions	Scopes	Financed GHG emissions (tCO_2e/year)			Financed GHG emissions (%)			Relative financed GHG emissions (tCO_2e/million euro)		
		2018	2023	2024	2018	2023	2024	2018	2023	2024
Natural gas	1	153,476	119,642	51,565	53.8	59.9	35.6	24.9	18.0	8.2
Other	1	-	-	409	-	-	0.3	-	-	0.1
Electricity	2	78,711	51,496	54,150	27.6	25.8	37.4	12.8	7.8	8.6
Other	2	-	-	545	-	-	0.4	-	-	0.1
Commuting	3	53,058	28,748	-#	18.6	14.4	-#	8.6	4.3	-#
Travel and transport	3	-	-	37,870	-	-	26.1	-	-	6.0
Other	3	-	-	392	-	-	0.3	-	-	0.1
Total	**1-2-3**	**285,245**	**199,885**	**144,931**	**100.0***	**100.0***	**100.0***	**46.3**	**30.2**	**23.0**
Total	**1-2**	**232,187**	**171,137**	**106,669**	**81.4**	**85.6**	**73.6**	**37.7**	**25.8**	**16.9**

*The sum in these columns is not always exactly 100% due to rounding per sector

Due to the adjustment in methodology, from 2024 onwards scope 3 will contain more than just commuting (see section 11.2). Therefore, commuting and other forms of travel and transportation will be covered in 'Travel and transport'.

In 2024, the methodology for calculating scope 1, 2, and 3 emissions was adjusted (see section 11.2.1). As a result, 2018, 2023, and 2024 results in Tables 11-3 and 11-4 cannot be directly compared. The impact of the methodological change on scope 1 natural gas and scope 2 electricity is presented in Table 11-5 in section 11.2.1 and should be taken into account when interpreting the results in this chapter. For scope 3, it was not possible to recalculate the 2018 and 2023 data using the current methodology; therefore, the 2024 financed scope 3 emissions are not comparable to those of previous years.

Taking the methodological change into account highlights important nuances in the emission trends (see Table 11-5 in section 11.2.1). For scope 1 natural gas, financed GHG emissions have decreased over the reported period, although the reduction is less pronounced than indicated in Table 11-3. For scope 2 electricity, the updated methodology shows higher financed GHG emissions for 2018 and 2023 (see Table 11-5), suggesting that the decline from 2018 to 2024 is actually larger than Table 11-3 indicates.

Due to a decrease in loans to clients for which a GHG footprint was calculated and lower reported financed GHG emissions, relative financed GHG emissions also appear lower in 2024 compared to 2023. However, taking into account the effect of the change in methodology, the actual decrease in relative financed GHG emissions is probably lower than suggested in Table 11-3.

Table 11-4 Financed GHG emissions per financed floor area (m²) for the healthcare sector in 2018, 2023 and 2024

Year	Financed GHG emissions real estate related ($kgCO_2e$) / financed m^2
2018	87.2
2023	72.4*
2024	46.1#

* In 2023, 1.4% of the loan portfolio is excluded from this figure, as the GHG emissions were calculated using a less precise method rather than based on energy consumption.

In 2024, 1.0% of the loan portfolio is excluded from this figure, as the GHG emissions were calculated using a less precise method rather than based on energy consumption.

To be able to compare energy consumption regardless of differences in client sets and surface, financed GHG emissions are expressed in relation to financed surface of buildings. This number is much lower in 2024 (46.1 kgCO2e/m2) than it was in 2023 (72.4 kgCO2e/m2). The total floor area owned by healthcare institutions is higher in 2024 than in 2023. The floor area in m^2 was gathered from the healthcare institutions themselves for 16.7% of the institutions. For the other 78.9% for which scope 1 and 2 were calculated, a new inventory of property data was carried out by the 'Kadaster'.[50] The increase in total floor area combined with the lower energy consumption data through the adjustment in methodology in 2024 has led to the difference in financed GHG emissions in relation to the financed floor area.

Financed emissions per financed m^2 are relatively high for healthcare institutions compared to other sectors. Many healthcare institutions operate 24 hours a day, resulting in higher energy consumption compared to institutions that operate only part of the day. In addition, the intensive use of medical equipment and devices, which require substantial energy, further contributes to their above-average emissions. There is a strong emphasis on reducing GHG emissions from healthcare institutions, which is also a key component of the Green Deal Healthcare 3.0.

[50] The Kadaster maintains registers of all real estate in the Netherlands, including land and buildings, detailing ownership and other rights.

11.2 Healthcare sector approach

11.2.1 Scopes 1, 2 and 3

Adjustment in methodology

This year, efforts in the healthcare sector have focused primarily on improving data quality by making use of the publicly available Environmental Barometers[51] from as many healthcare institutions as possible. This data comes directly from the institutions themselves and is therefore assigned a data quality score of 2. Since an Environmental Barometer is not available for all healthcare institutions, a combination of methods has been used this year, with the aim of gradually increasing the use of publicly available Environmental Barometers in the coming years. It was not possible to apply the same method for 2018 and 2023; therefore, the 2024 CO_2 footprints cannot be directly compared with those of previous years. This should be considered when interpreting the results in section 11.1.2.

An indication of the differences between the results of the new and previous methodology are shown in Table 11-5. Only scope 1 natural gas and scope 2 electricity were recalculated for the same set of healthcare institutions with GHG emissions of the loan portfolios of 2018 and 2023, using the current methodology. This way, the effect of the change in methodology can be identified. For scope 1 natural gas, the current methodology would have resulted in lower GHG emissions in 2023 and 2018. Scope 2 electricity GHG emissions would have been higher in 2023 and 2018 using the current methodology.

Table 11-5 Effect of change in methodology on the financed GHG emissions in tCO_2e

Source of emissions	Scopes	Current method 2023	Previous method 2023	Difference (%)* 2023	Current method 2018	Previous method 2018	Difference (%)* 2018
Natural gas	1	68.935[^]	119.642	-42.4	88.702[#]	153.476	-42.2
Electricity	2	62.185[^]	51.496	20.8	107.171[#]	78.711	36.2

*The difference is calculated with the following formula: (New-Previous)/Previous*100

[^] For 1 healthcare institution it was not possible to recalculate the scope 1 and 2 emissions for 2023. The coverage rate compared to the currently used 2023 loan portfolio with GHG emissions is 99.9%. In 2023, for 1.4% of the loan portfolio, the GHG emissions were calculated with a less precise method. For the recalculation, the 2023 GHG emissions were used for this part of the loan portfolio as for these healthcare institutions emissions could not be recalculated.

[51] Milieubarometer (n.d.). Openbare footprints (Dutch website).

[#] For 19 healthcare institutions it was not possible to recalculate the scope 1 and 2 emissions for 2018. The coverage rate compared to the currently used 2018 loan portfolio with GHG emissions is 98.3%.

This year, three methods were used to calculate Scopes 1 and 2 emissions for healthcare institutions:

1. For the majority of healthcare institutions (78.9%), key figures per square metre from Environmental Barometer were applied as a baseline to calculate natural gas and electricity consumption, based on five different types of healthcare institutions (care for the disabled, mental healthcare, nursing care, general practitioners and hospitals). These key figures were adjusted using institution-specific data that were received from public Environmental Barometers. This year, the key figures used by Republiq to calculate natural gas and electricity consumption are taken from Environmental Barometer[52], which was not the case in previous years.
2. For 15,8 % of the healthcare institutions , scope 1 and 2 data from the publicly accessible Environmental Barometers were used[53] and floor area data were obtained via Stimular, following written consent from these institutions.
3. For a few healthcare institutions (0.9% — mainly hospitals) that do have an Environmental Barometer but not publicly accessible, data on natural gas, electricity consumption, and heat consumption were obtained via Stimular.

Two methods were used to calculate scope 3 emissions for healthcare institutions:

1. For most healthcare institutions (29.8%), commuting and business travel were calculated based on key figures in kilometres per FTE from Environmental Barometer[54], using five different types of healthcare institutions (care for the disabled, mental healthcare, nursing care, general practitioners, and hospitals). Unfortunately, no key figures were available for business travel of hospitals; therefore, this sector only includes GHG emissions from commuting within Scope 3.
2. For 18.4% of the healthcare institutions, scope 3 data from the publicly available Environmental Barometers were used.[55] All categories were included except for waste and raw materials, visitor kilometres and feed-in electricity as these were only covered in a few Environmental Barometers. Self-generated electricity (for example from solar panels) has not been included, as it is unclear whether the institutions consume all of the

[52] Milieubarometer (n.d.). Branchegemiddeldes van de zorg (Dutch website).

[53] Milieubarometer (n.d.). Openbare footprints (Dutch website).

[54] Milieubarometer (n.d.). Branchegemiddeldes van de zorg (Dutch website).

[55] Milieubarometer (n.d.). Openbare footprints (Dutch website).

generated electricity themselves or feed some of it back into the grid. For healthcare institutions with a public Environmental Barometer, travel by vehicle (commuting, business travel, passenger cars, delivery vans, freight transport etc.) is included under Scope 3 because these institutions did not make a clear distinction between vehicles owned or leased (Scope 1) and public transport or private cars (Scope 3).

General factsheet

Scopes covered

The healthcare approach covers scopes 1, 2, and part of scope 3. Scope 1 emissions are direct GHG emissions resulting from the consumption of natural gas for heating buildings or other on-site purposes. For healthcare institutions with a publicly available Environmental Barometer, emissions from machinery, diesel used for heating, refrigerants, and other specific sources were also included in scope 1. However, not all healthcare institutions report these additional emissions under scope 1.

Scope 2 emissions represent indirect GHG emissions associated with the consumption of purchased electricity, heat, or steam. Data on heat and steam consumption are only available for healthcare institutions that have a publicly accessible Environmental Barometer, and therefore not for all institutions.

Scope 3 emissions in the current healthcare approach include estimated emissions from commuting and business travel when no Environmental Barometer, data were available. In cases where healthcare institutions did have an Environmental Barometer, scope 3 emissions could also include emissions from drinking water, wastewater, commuting, business travel, passenger transport, and freight transport. Again, not all healthcare institutions report the same emissions under scope 3.

Portfolio covered

The healthcare sector coverage ratio is 99.7% for 2024. For 98.7% of the healthcare loan portfolio energy consumption data were available. For 1.0% of the healthcare portfolio no energy consumption data were available, and a less accurate calculation method was used. For 0.3% of the healthcare loan portfolio no energy consumption data were available, and thus no GHG emissions are calculated.

Of the loans of clients for which a GHG footprint was calculated, scope 3 is part of the GHG footprint for 77.2% in 2024.

Data

Data used for healthcare institutions with energy consumption data

Data for scopes 1, 2 and 3 are coming from publicly available Environmental Barometers reported by the healthcare institutions themselves, or from key figures for the sector reported by Stimular on the website of the Environmental Barometer.[56] These key figures were adjusted using institution-specific data that were received from public Environmental Barometers.

Data on the total balance sheet per healthcare institution per year come from CIBG; Ministerie van Volksgezondheid, Welzijn en Sport.

Data used for healthcare institutions lacking energy consumption data

For fifteen healthcare institutions energy consumption data was not available. For thirteen of these institutions, the GHG emissions have been calculated based on the outstanding loan amount and a PCAF emission factor.

Loan-specific information includes:

- NACE codes: Used to classify economic activities and map loans to the corresponding sectors and subsectors.
- Outstanding loan amounts: The nominal value of loans provided to clients, which serves as the basis for GHG emissions calculations.
- Subsector classifications: Detailed breakdowns of financed activities.

Emission Factors:

Emission factors are applied according to the PCAF guidelines, using sector-specific data to estimate scope 1 (direct) and scope 2 (indirect from electricity) emissions. These factors are sourced from reputable databases and methodologies, including DEFRA, FAOSTAT, IPCC EFDB, Joint European Commission, Exiobase, and Probas. These emission factors are expressed in terms of tCO_2e per million euros financed.

Indexing of outdated climate data:

Data has been indexed based on the principle that in the adjustment of economic emissions intensities only the monetary value is adjusted, not the emissions in line with PCAF guidance. A CPI index for the Netherlands was used to adjust this.

[56] Milieubarometer (n.d.). Branchegemiddeldes van de zorg (Dutch website).

Grid emission factors

Grid emission factors for healthcare institutions with energy consumption data

Appendix A contains more information on emission factors. The following emission factors from Appendix A have been used:

- Natural gas
- Electricity (unknown source)
- Electricity (Wind Power/Hydropower/Solar Energy/Biomass)
- Electricity (green)
- Electricity (grey)
- Electricity (average heating networks)
- Public transport in general (traveled kms; Bus, Tram, Metro average)
- Public transport by bus (traveled kms; unknown bus type)
- Public transport by train (traveled kms; unknown train type)
- Minibus, Diesel.
- Car, unknown fuel & weight
- Car, Electric
- Car, Petrol hybrid.
- Car, Petrol, weight class middle.
- Car, Diesel, weight class middle.
- Car, LPG, weight class middle.
- Motorcycle, Petrol.
- Moped, average.
- Electric bikes/moped/scooter/motor bikes
- Refrigerants (R407c, R404a, R507, R410a, R449a, R448a, R744, R134a, R32)
- Nitrous oxide
- Sulphur Hexafluoride
- Diesel (B7) (NL)
- Petrol (E10) (NL)
- Propane
- Bio-diesel (HVO)

For some emission types, the grid emission factors from the Environmental Barometer were used, as these emission types were not available at CO2emissiefactoren.nl.

Grid emission factors for healthcare institutions lacking energy consumption data

Grid emission factors represent the average GHG emissions associated with the generation, and delivery of electricity consumed by financed organisations. For scope 2 emissions, these factors reflect the carbon intensity of the power grid in the region where the financed activities take place.

The grid emission factors are embedded within the sector-specific averages used for PCAF Classification Level 1. These factors ensure that the scope 2 emissions for the loan portfolio account for the electricity consumption of each sector, adjusted for regional variations in energy mix and grid intensity.

For this portfolio, grid emission factors are expressed as tCO_2e per million euros financed, providing a standardised approach to estimate indirect emissions from purchased electricity.

Calculation steps

Calculation steps for healthcare institutions with energy consumption data

Scopes 1 & 2

Scope 1 emissions are the direct GHG emissions of organisations. For healthcare institutions, these emissions result from the use of natural gas to heat buildings or to disinfect medical instruments. Scope 2 emissions include the indirect GHG emissions from the generation of purchased or acquired electricity, steam, heating or cooling consumed by the healthcare institution.

This year, three methods were used to calculate scope 1 and 2 emissions for healthcare institutions:

1. For the majority of healthcare institutions (78.9%), key figures per square metre from the Environmental Barometer were applied to calculate natural gas and electricity consumption, based on five different types of healthcare institutions (care for the disabled, mental healthcare, nursing care, general practitioners and hospitals). Republiq carried out these calculations through the following steps:
    a. Inventory of buildings owned by healthcare institutions.
    BNG provided an overview of the healthcare institutions in its loan portfolio. Using Kadaster data, Republiq has inventoried the properties of these healthcare institution. The source of the floor area data is the Basic Register of Addresses and Buildings (BAG). The reference date for the total floor area per healthcare institution is 1-1-2025.
    b. Estimate energy consumption data.
    Where healthcare institutions provided actual energy consumption data, these primary data were directly used in the calculations. For institutions where no primary consumption data were available, Republiq estimated the energy consumption using key figures from the Environmental Barometer for natural gas and electricity consumption. These key figures from the Environmental

Barometer were further refined and adjusted based on actual consumption data received from other healthcare institutions from the public Environmental Barometers. For each healthcare institution Republiq summarised the following measures:

- Total electricity consumption (in kWh)
- Total gas consumption (in Nm^3)
- Floor area (m^2)

2. For 15.8% of the healthcare institutions, scope 1 and 2 data from the publicly accessible Environmental Barometers were used[57], and floor area data were obtained via Stimular, following written consent from these institutions.
   Scopes 1 and 2 emissions for healthcare institutions with a public Environmental Barometers can include, where available, the following items:
   - Natural gas
   - Electricity
   - Heat
   - Emissions such as refrigerants, isoflurane, sevoflurane and nitrous oxide
   - Diesel for heating
   - Machinery

   Business travel is included under Scope 3 because the institutions did not make a clear distinction between vehicles owned or leased (Scope 1) and public transport or private cars (Scope 3).
3. For a few healthcare institutions (0.9% — mainly hospitals) that do have an Environmental Barometer but not publicly accessible, data on natural gas, electricity consumption, and heat consumption were obtained via Stimular.

The total energy consumption per healthcare institution was converted into kg GHG emissions using the correct emission factor from Appendix A. These GHG emissions in kg were divided by 1,000 to obtain GHG emissions in tonnes.

Scope 3

Scope 3 should cover all other indirect emissions (not included in Scope 2). In this report, scope 3 emissions contain travel and transport. This year, two methods were used to calculate Scope 3 emissions for healthcare institutions:

1. For the majority of healthcare institutions (29.8%), commuting and business travel were calculated using key figures in kilometres per Full

[57] Milieubarometer (n.d.). Openbare footprints (Dutch website).

Time Equivalent (FTE) from the Environmental Barometer[58], based on five types of healthcare institutions (care for the disabled, mental healthcare, nursing care, general practitioners and hospitals). Unfortunately, no key figures were available for business travel for hospitals; therefore, this sector only includes GHG emissions from commuting within Scope 3.
The key figures in kilometres per FTE were multiplied by each institution's FTE to calculate total distances, which were then multiplied by the relevant emission factor (car, unknown fuel type, and unknown weight class) to determine the GHG emissions. Data on FTE were sourced from the Ministry of Health, Welfare and Sport for 2024. If the number of FTE was missing in this database, the FTE from the clients in the top 20 of highest loans was obtained from annual reports. Not all missing FTE figures have been filled in.

2. For the other 18.4%, scope 3 data from the publicly available Environmental Barometers were used.[59] Scope 3 for healthcare institutions with a public Environmental Barometer includes, where available, the following items:
    - Purchased drinking water
    - Commuting
    - Business travel
    - Freight transport
    - Passenger transport
    - Wastewater

    The following items were not included as these were only covered in a few Environmental Barometers:
    - Waste and raw materials
    - Visitor kilometres
    - Feed-in electricity

    Self-generated electricity (for example from solar panels) has not been included, as it is unclear whether the institutions consume all of the generated electricity themselves or feed some of it back into the grid.

    The categories were multiplied by the appropriate emission factor to calculate the GHG emissions. The used emission factors are mentioned at the section grid emission factors. For healthcare institutions with a public environmental barometer, travel by vehicle (commuting, business travel, passenger cars, delivery vans, etc.) is included under Scope 3 because the

[58] Milieubarometer (n.d.). Branchegemiddeldes van de zorg (Dutch website).
[59] Milieubarometer (n.d.). Openbare footprints (Dutch website).

institutions did not make a clear distinction between vehicles owned or leased (Scope 1) and public transport or private cars (Scope 3).

The kilograms of GHG emissions for each category of scope 3 were added up to obtain the total scope 3 emissions. These GHG emissions in kg were divided by 1,000 to obtain GHG emissions in tonnes.

Overall

After calculating the scope 1, 2 and 3 GHG emissions, these GHG emissions were multiplied by the ratio of outstanding loan to total balance sheet per client. For example, if the ratio of outstanding loans to total balance sheet is 25%, 25% of the healthcare institution's scope 1, 2 and 3 GHG emissions are attributed to BNG. The financed GHG emissions per client are added up to obtain the total financed GHG emissions per sector.

The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume of the clients for which a GHG footprint was calculated in this report.

To calculate the GHG emissions per m^2 the total financed GHG emissions in $kgCO_2e$ for the healthcare institutions were divided by the total financed floor area (m^2) of the healthcare institutions included in the calculated GHG footprint. The total financed floor area was calculated by multiplying the total floor area by the ratio of outstanding loans to total balance sheet.

For the calculation of the coverage ratio, only those healthcare institutions were considered for which it was possible to calculate at least scopes 1 and 2. For some healthcare institutions, scope 3 could not be calculated because FTE data was missing.

Calculation steps for healthcare institutions lacking energy consumption data

The calculation of GHG emissions follows a standardised approach based on the PCAF methodology, utilizing the 3b method for business loans and unlisted equity. This method applies emission factors based on economic activity, using sector-specific averages provided through recognised databases. These emission factors are aligned with the primary business activities of the financed organisation and reflect emissions per unit of assets.

The 3b method ensures emissions are attributed proportionally to BNG's share of financing, relative to the clients' total financial needs. This approach leverages emission factors validated through established methodologies, ensuring they are consistent with the activities financed by the bank. Data quality is assessed in alignment with PCAF standard.

1. *Emission factor assignment:*
The NACE code of each healthcare institution is used to find the sector-specific emission factors.

2. *Loan attribution:*
The GHG emissions for each loan are attributed based on the outstanding loan amount relative to the total emissions associated with the financed activity. This ensures that the emissions reflect the financial share of the organisation covered by the loan.

3. *Indexing of outdated climate data:*
The emission factor has been adjusted by using a CPI index for the Netherlands.

4. *Financed GHG Emissions:*
For each loan, emissions are calculated using the formula:

Financed GHG Emissions (tCO_2e) = Outstanding Loan Amount (€) * Emission Factor (tCO_2e/M. Euro)

5. *Data Quality assessment:*
Each calculation is assigned a Data Quality (DQ) score based on the PCAF standards. Higher scores indicate reliance on sector averages rather than borrower-specific data.

Avoided emissions

The avoided emissions for the healthcare sector are not known and therefore not reported in this report.

Asset class specific considerations

For the calculations based on energy consumption data, the approach for the healthcare sector is in line with the 'Commercial real estate' approach in the PCAF methodology.

Attribution

Attribution for healthcare institutions with energy consumption data

To calculate the GHG footprint according to the PCAF principles, a general approach has been developed. First, the GHG emissions of the different entities in the sector are calculated. Then, the BNG's share of the total balance sheet is used to determine the share of GHG emissions for which BNG is responsible.

$$\sum \boldsymbol{CO_2eq} \times \frac{\boldsymbol{Outstanding\ loan\ volume}}{\boldsymbol{Total\ balance\ sheet\ (equity + debt)}}$$

Finally, the individual scopes and the sum of the scopes of all individual organisations have been aggregated.

Attribution for healthcare institutions lacking energy consumption data

Method 3b (outstanding loan amount): emissions are attributed to BNG based on its proportional financial involvement in the borrower's operations. For business loans, this is calculated as the outstanding loan amount relative to the borrower's total financial needs. This ensures that reported GHG emissions correspond to BNG's share of responsibility for the financed activities, in alignment with the PCAF methodology.

Absolute vs. relative emissions

The financed GHG emissions and relative financed emissions are reported per scope. The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume in million euro of the clients for which a GHG footprint was calculated in this report.

Limitations

Limitations for healthcare institutions with energy consumption data

For 5.8% of the healthcare institutions data on the total balance sheet were not available. For these institutions, the total balance sheet was calculated based on the average ratio outstanding loan volume / total balance sheet. However, there is a possibility of over- or underestimation.

Scopes 1 & 2

For healthcare institutions where actual natural gas and electricity consumption for 2024 is unavailable, energy consumption has been estimated using key figures. This method is less precise using actual consumption data

The energy consumption data obtained from Republiq only relates to buildings owned by healthcare institutions. Buildings rented by the institutions fall outside the scope. However, if energy consumption data for rented buildings is available, the associated GHG emissions should be included under scope 3.

Ideally, GHG emissions from other sources within the primary processes of healthcare institutions should also be taken into account. Examples include GHG emissions from ambulances and trauma helicopters. Unfortunately, for the majority of healthcare institutions this information is not available. For some institutions, however, data from the Environmental Barometer was used for the CO_2e footprint

calculation, which for some institutions also included GHG emissions from sources beyond natural gas and electricity consumption.

Scope 3

Scope 3 should cover all other indirect emissions (not included in Scope 2). For healthcare institutions with a publicly available Environmental Barometer, different emission types were reported. Some healthcare institutions only reported commuting, others reported multiple other emission types. Therefore, the scope of scope 3 is different for each healthcare institution. Furthermore, healthcare institutions did not make a clear distinction between vehicles owned or leased (Scope 1) and public transport or private cars (Scope 3), which is why business travel was included under scope 3. Therefore, scope 1 is underestimated and scope 3 overestimated.

For healthcare institutions without an Environmental Barometer, there are other limitations. The number of employees (in FTE) has a significant impact on the results. From 2022, FTE data from fewer healthcare institutions are registered in the database of the Ministry of Health, Welfare and Sport. As a result, FTE data from many healthcare institutions were missing for 2024. To calculate a scope 3 GHG footprint for 2024, the FTE of 20 healthcare institutions with a relatively large loan at BNG were looked up in the annual report of the healthcare institution. However, a significant number of healthcare institutions have no available FTE data.
For this method, key figures in kilometres per FTE per type of healthcare institution were used. Unfortunately, no key figures were available for business travel for hospitals; therefore, this sector only includes GHG emissions from commuting within Scope 3. In addition, some healthcare institutions could not be categorized into one of the five types of healthcare institutions (care for the disabled, mental healthcare, nursing care, general practitioners and hospitals). For these institutions, scope 3 was omitted.

To summarize: When FTE data were unavailable or a healthcare institution could not be categorized into one of the five healthcare types, only scopes 1 and 2 emissions were calculated, with scope 3 omitted. This results in an underestimation of the total scope 3 emissions.

Limitations for the healthcare institutions lacking energy consumption data

Data availability: client-specific data are not available for these clients. Especially relatively smaller companies do not disclose information on GHG emissions. Therefore, a method with a lower PCAF data quality score has been used.

Data quality: PCAF recommends using the Classification Level 2 emission factors for internal analysis only. As a result, Classification level 2 cannot be used for this calculation. Within Classification level 1, it is not possible to distinguish between subsectors. This results in the reliance on the more aggregated Classification Level 1 emission factors, which introduces inherent uncertainties, particularly for sectors with high variability in emissions profiles.

Data quality estimate

Data quality score for the healthcare institutions with energy consumption data

Scopes 1 & 2

Data quality score is 2 and 3.

For 24.8% of outstanding loans to this sector data quality score is 2. Primary data in "the Environment Barometer"[60] comes from the institutions themselves and therefore data quality score is 2.

For 73.9% of outstanding loans to this sector data quality score is 3. For these healthcare institutions an estimation for natural gas and electricity consumption was made based on key figures of the Environmental Barometer.[61] Energy consumption data are based on averaged data that is peer/(sub)-sector-specific, therefore data quality score is 3.

Scope 3

Data quality score is 2 and 3.

For 27.7% of outstanding loans to this sector, the Environmental Barometer was used. In these cases, the data quality score is 2. The data used to calculate Scope 3 CO_2e emissions is provided directly by the institutions themselves.

For 48.2% of outstanding loans, part of the scope 3 CO_2e emissions has been estimated using sector-specific key figures for commuting and business travel, combined with the institutions' FTE figures. For these institutions, the data quality score is 3, as sector-based key figures have been applied.

For the remaining part of the loan portfolio, scope 3 was not calculated due to a lack of data.

Data quality score for the healthcare institutions lacking energy consumption data

For 1.0% of outstanding loans in this sector, the data quality score is 5 for all three scopes. GHG emissions were calculated using the outstanding loan amount and a sector-specific emission factor. This results in a data quality score of 5, reflecting the use of sector-specific factors due to the absence of borrower-specific information.

[60] Milieubarometer (n.d.). Openbare footprints (Dutch website).
[61] Milieubarometer (n.d.). Branchegemiddeldes van de zorg (Dutch website).

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data files mentioned in the factsheet below.

List of the calculation sheets	Location
251217_rekensheet_zorg_BNG_2024	25155 PCAF 2025\Werkmap\Zorg\f4. Berekening BNG
251217_Scope 1, 2, 3 Milieubarometer BNG	25155 PCAF 2025\Werkmap\Zorg\f4. Berekening BNG
251030_Scope 3 Kengetallen MB BNG	25155 PCAF 2025\Werkmap\Zorg\f4. Berekening BNG
251218_Scope 1 en 2 Republiq BNG	25155 PCAF 2025\Werkmap\Zorg\f4. Berekening BNG
251217_Scope 1 en 2 Republiq BNG - jaar 2018 methode 2	25155 PCAF 2025\Werkmap\Zorg\f4. Berekening BNG
251217_Scope 1 en 2 Republiq BNG - jaar 2023 methode 2	25155 PCAF 2025\Werkmap\Zorg\f4. Berekening BNG
251217_Scope 1 en 2 Republiq BNG - jaar 2018 2023 – methode 1	25155 PCAF 2025\Werkmap\Zorg\f4. Berekening BNG

12 Educational institutions

12.1 Results educational institutions

In 2024, the education sector accounts for a small share of BNG's loan portfolio, representing 1.1% of the total.

12.1.1 Coverage ratio and attribution

Between 2023 and 2024, the education loan portfolio decreased by 33 million euro. The coverage ratio increased to 100%. The total balance sheet of clients for which a GHG footprint was calculated decreased by 77 million euro. Therefore, the ratio loan portfolio versus total balance sheet decreased slightly. For 2018, 2023 and 2024, the loan portfolio, the total balance sheet and the coverage ratio are shown in Table 12-1.

Table 12-1 Loan portfolio, coverage ratio and ratio loan portfolio versus total balance sheet for the educational institutions in 2018, 2023 and 2024

Year	Total loan portfolio (million euro)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)	Coverage ratio of total loan portfolio (%)	Total balance sheet of clients for which a GHG footprint was calculated (million euro)	Ratio loan portfolio / total balance sheet of clients for which a GHG footprint was calculated^
2018	979	1,2	547	55.9	4,340	0.13
2023	1,035	1,2	1,035	100.0	7,773*	0.12*
2024	1,002	1,1	1,002	100.0	7,697#	0.11#

^ In 2023 and 2024, the total balance sheets for 8 and 10 educational institutions, respectively, were unavailable. For these institutions, a loan-to-balance-sheet ratio was calculated using the average loan-to balance sheet ratio of the other institutions. An average ratio of 0.27 was applied for 2023, and 0.27 for 2024.

*In 2023, 26.8% of the loan portfolio is excluded from this figure, as the GHG emissions were calculated using a less precise method rather than based on energy consumption.

#In 2024, 28.7% of the loan portfolio is excluded from this figure, as the GHG emissions were calculated using a less precise method rather than based on energy consumption.

12.1.2 Energy consumption and financed GHG emissions

Table 12-2 is included in this report to show the total energy consumption data that is behind the calculated GHG footprint. Because the number of clients included in the loan portfolio and the coverage ratio have changed between 2023 and 2024, the energy consumption data cannot be compared between the years.

Table 12-2 Total energy consumption of the educational institutions in 2018, 2023 and 2024

Year	Natural gas consumption (m^3)	Electricity consumption (kWh)
2018	35,104,141	149,190,597
2023*	30,338,464	148,042,702
2024#	26,444,648	148,844,839

*In 2023, 26.8% of the loan portfolio is excluded from this figure, as the GHG emissions were calculated using a less precise method rather than based on energy consumption.

#In 2024, 28.7% of the loan portfolio is excluded from this figure, as the GHG emissions were calculated using a less precise method rather than based on energy consumption.

Table 12-3 shows the calculated GHG footprint results for education institutions in 2018, 2023 and 2024.

Table 12-3 Absolute and relative financed GHG emissions for the educational institutions in 2018, 2023 and 2024

Subsector	Source of emissions	Scopes	Financed GHG emissions (tCO_2e/year)			Financed GHG emissions (%)			Relative financed GHG emissions (tCO_2e/million euro)		
			2018	2023	2024	2018	2023	2024	2018	2023	2024
Primary and Secondary Education	Natural gas	1	3,641	2,974	2,574	27.3	21.0	19.9	6.7	2.9	2.6
	Electricity	2	2,353	1,466	1,407	17.6	10.3	10.9	4.3	1.4	1.4
Post-Secondary Education	Natural gas	1	3,336	4,064	3,625	25.0	28.7	28.0	6.1	3.9	3.6
	Electricity	2	4,011	5,201	4,937	30.0	36.7	38.2	7.3	5.0	4.9
Other Educational institutions	Natural gas	1	8	389	325	0.1	2.7	2.5	0.0	0.4	0.3
	Electricity	2	6	87	57	0.0	0.6	0.4	0.0	0.1	0.1
Total	**All**	**1-2**	**13,354**	**14,182**	**12,925**	**100.0***	**100.0***	**100.0***	**24.4**	**13.7**	**12.9**

*The sum in these columns is not always exactly 100% due to rounding per sector

Table 12-4 Financed GHG emissions per financed floor area (m^2) for educational institutions in 2018, 2023 and 2024

Year	Financed GHG emissions real estate related ($kgCO_2e$) / financed m^2
2018	33.7
2023	29.4*
2024	28.3#

*In 2023, 26.8% of the loan portfolio is excluded from this figure, as the GHG emissions were calculated using a less precise method rather than based on energy consumption.

#In 2024, 28.6% of the loan portfolio is excluded from this figure, as the GHG emissions were calculated using a less precise method rather than based on energy consumption.

When interpreting these data over the years, the increase in coverage ratio should be taken into account. The total relative financed GHG emissions decreased by 0.8 tonnes CO_2 per million euro between 2024 and 2023. A decrease is seen for all three subsectors and for both scope 1 and 2. To be able to compare energy consumption regardless of differences in client sets, financed GHG emissions are expressed in relation to financed surface of buildings. These financed GHG emissions per financed m2 have decreased as well compared to both 2018 and 2023.

For educational institutions, it is often challenging to make buildings more sustainable in order to meet climate targets, due to limited budgets and existing infrastructure. However, the efforts taken still lead to decreased emissions, as energy-efficient measures reduce overall energy consumption and fossil fuel use.

12.2 Educational institutions approach

12.2.1 Scopes 1 and 2

Adjustments in methodology

To estimate energy consumption, Republiq uses key figures provided by Vivet.[62] These figures became available this year for 2022 and 2023. As the methodology differs from that used in previous years, the GHG emissions for 2018 and 2023 have also been recalculated using these updated figures. For 2018 and 2024, an estimate has been made based on the trends in energy consumption as published by CBS.[63] For primary and secondary education, key figures from Vivet are used, with a breakdown by construction period. For higher education, key figures from CBS are applied, broken down by building surface categories.

The differences between the results of the new and previous methodology are shown in Table 12-5.

Table 12-5 Effect of change in methodology on the GHG emissions in tCO_2e

Source of emissions	Scopes	New 2023	Previous 2023	Difference (%) * 2023	New 2018	Previous 2018	Difference (%) * 2018
Natural gas	1	7,427	6,750	10.0	6,985	9,453	-26.1
Electricity	2	6,755	6,929	-2.5	6,369	6,469	-1.5

*The difference is calculated with the following formula: (New-Previous)/Previous*100

General factsheet

Scopes covered

The education sector covers both scopes 1 and 2. Scope 1 emissions are direct GHG emissions. These emissions result from the consumption of natural gas to heat buildings or for other purposes. Scope 2 emissions are the indirect GHG emissions from the consumption of purchased electricity, heat or steam. The consumption of heat and steam per educational institution is not known. Scope 2 therefore only includes purchased electricity.

[62] VIVEThttps://programmavivet.nl/projecten/2942314.aspx (n.d.). Energieverbruik maatschappelijk vastgoed (Dutch website).
[63] CBS (2025). Energiebalans; aanbod en verbruik, sector (Dutch website).

Portfolio covered

The portfolio coverage ratio for this sector is 100%. For 71.3% of the education loan portfolio energy consumption data were available. For 28.7% of the education portfolio no energy consumption data were available, and a less accurate calculation method was used.

Data

Data used for the education institutions with energy consumption data

The energy consumption data of educational institutions are based on key figures on energy consumption for the education sector from Vivet and CBS.

Data of the total balance sheet per educational institute per year, are coming from DUO, the Dutch Education Service of Ministry of Education, Culture and Science.

Data used for the education institutions lacking energy consumption data

For thirteen educational institutions energy consumption data was not available. For nine institutions the GHG emissions are calculated based on the outstanding amount and a PCAF emission factor. For the other four institutions emissions are based on m^2 data of the client, which lead to a better data quality score.

Loan-specific information includes:

- NACE codes: Used to classify economic activities and map loans to the corresponding sectors and subsectors.
- Outstanding loan amounts: The nominal value of loans provided to clients, which serves as the basis for GHG emissions calculations.
- Subsector classifications: Detailed breakdowns of financed activities

Emission Factors:

Emission factors are applied according to the PCAF guidelines, using sector-specific data to estimate scope 1 (direct) and scope 2 (indirect from electricity) emissions. These factors are sourced from reputable databases and methodologies, including DEFRA, FAOSTAT, IPCC EFDB, Joint European Commission, Exiobase, and Probas. These emission factors are expressed in terms of tCO_2e per million euros financed.

Indexing of outdated climate data:

Data has been indexed based on the principle that in the adjustment of economic emissions intensities only the monetary value is adjusted, not the emissions in line with PCAF guidance. A CPI index for the Netherlands was used to adjust this.

Client specific data (m^2 and total balance sheet):

For four clients documents were available which contain the m^2 of the property owned by these clients and the activities these buildings are used for. Annual

reports are also available for these clients, which were used to collect the balance sheet totals.

Grid emission factors

Grid emission factors for the education institutions with energy consumption data

Appendix A contains more information on emission factors.

The following emission factors from Appendix A were used:

- Natural gas
- Electricity (Unknown source)

Grid emission factors for the education institutions lacking energy consumption data

Grid emission factors represent the average GHG emissions associated with the generation and delivery of electricity consumed by financed organisations. For scope 2 emissions, these factors reflect the carbon intensity of the power grid in the region where the financed activities take place.

The grid emission factors are embedded within the emission factors used for the calculations based on outstanding loan amount, as well as the emission factors used for calculations based on m2.

Calculation steps

Calculation steps for the education institutions with energy consumption data

The following steps were performed by Republiq:

1. Inventory of buildings owned by educational institutions
2. Estimate energy consumption data

1. Inventory of buildings owned by educational institutions

Republiq has made a list of all the buildings that are owned by the educational institutions that are clients at BNG. To create this list for primary and secondary schools, Republiq made use of data from DUO (Dienst Uitvoering Onderwijs). For some missing primary and secondary schools and for higher education, Republiq manually looked up which buildings are used by the educational institutions or Republiq has obtained these data from Kadaster.

2. Estimate energy consumption data

To estimate energy consumption, Republiq uses key figures provided by Vivet.[64] In the Vivet project, CBS and Kadaster collaborated to provide insights into energy consumption across various sectors of public real estate. The key figures are available for the years 2022 and 2023. For 2024 and 2018, an estimate has been made on the trends in energy consumption as published by CBS.[65]

Republiq combines these estimates with the dataset from step 1.

Republiq provided Het PON & Telos with the following data:

- Total electricity consumption (in kWh)
- Total gas consumption (in Nm^3)
- Floor area (m^2)

The next steps were carried out by Het PON & Telos:

The total energy consumption per educational institution was converted into kg GHG emissions using the emission factor for electricity (unknown source) and natural gas consumption (see Appendix A). These GHG emissions in kg were divided by 1,000 to obtain GHG emissions in tonnes.

After calculating scopes 1 and 2 GHG emissions, these GHG emissions were multiplied by the ratio of outstanding loan to total balance sheet ratio per client. For example, if the ratio of outstanding loans to total balance sheet is 25%, 25% of the education institution's scope 1, 2 and 3 GHG emissions are attributed to BNG. The financed GHG emissions per client are added up to obtain the total financed GHG emissions per sector.

The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume of the clients for which a GHG footprint was calculated in this report.

Floor area

The source of the floor area data is the Basic Registration of Addresses and Buildings (BAG). The reference date for the total floor area of buildings owned by municipalities is 1-1-2025. To calculate the financed GHG emissions per financed m^2, the total attributed GHG emissions in tCO_2e for the educational institutions were divided by the total financed floor area (m^2) of the educational institutions.

Calculation steps for the education institutions lacking energy consumption data

Method based on outstanding amount:

[64] VIVET (n.d.). Energieverbruik maatschappelijk vastgoed (Dutch website).
[65] CBS (2025). Energiebalans; aanbod en verbruik, sector (Dutch website).

The calculation of GHG emissions follows a standardised approach based on the PCAF methodology, utilizing the 3b method for business loans and unlisted equity. This method applies emission factors based on economic activity, using sector-specific averages provided through recognised databases. These emission factors are aligned with the primary business activities of the financed organisation and reflect emissions per unit of assets.

The 3b method ensures emissions are attributed proportionally to BNG's share of financing, relative to the clients' total financial needs. This approach leverages emission factors validated through established methodologies, ensuring they are consistent with the activities financed by the bank. Data quality is assessed in alignment with PCAF standard.

1. Emission factor assignment:

The NACE code of each education institution is used to find the sector-specific emission factors.

2. Loan attribution:

The GHG emissions for each loan are attributed based on the outstanding loan amount relative to the total emissions associated with the financed activity. This ensures that the emissions reflect the financial share of the organisation covered by the loan.

3. Indexing of outdated climate data:

The emission factor has been adjusted by using a CPI index for the Netherlands.

4. Financed GHG Emissions:

For each loan, emissions are calculated using the formula:

Financed GHG Emissions (tCO_2e) = Outstanding Loan Amount (€) * Emission Factor (tCO_2e/M. euro)

5. Data Quality assessment:

Each calculation is assigned a Data Quality (DQ) score based on the PCAF standards. Higher scores indicate reliance on sector averages rather than borrower-specific data.

Method based on m^2:

1. Emission factor assignment:

The type of building and the activities for which the building is used determine which emission factor is assigned to the specific client. This detailed client information is available within BNG.

2. Loan attribution:

The GHG emissions for each loan are attributed based on the outstanding loan amount relative to total balance sheet of the client.

3. Financed GHG Emissions:

For each loan, emissions are calculated using the formula:

Financed GHG Emissions (tCO_2e) = (Outstanding loan amount (€) / Total balance sheet (€)) * m^2 * Emission Factor (tCO_2e/m^2)

4. Data Quality assessment:

Each calculation is assigned a Data Quality (DQ) score based on the PCAF standards. Higher scores indicate reliance on sector averages rather than borrower-specific data.

Avoided emissions

The avoided emissions for the educational institutions are not known and therefore not reported in this report.

Asset class specific considerations

For the calculation based on energy consumption data, the approach for the educational institutions is in line with the 'Commercial real estate' approach in the PCAF methodology.

Attribution

Attribution for the education institutions with energy consumption data

To calculate the GHG footprint according to the PCAF principles, a general approach has been developed. First, the GHG emissions of the different entities in the sector are calculated. Then, the BNG's share of the total balance sheet is used to determine the share of GHG emissions for which BNG is responsible.

$$\sum \boldsymbol{CO_2eq} \times \frac{\boldsymbol{Outstanding\ loan\ volume}}{\boldsymbol{Total\ balance\ sheet\ (equity + debt)}}$$

Finally, the individual scopes and the sum of the scopes of all individual organisations have been aggregated.

Attribution for the education institutions lacking energy consumption data

Method based on outstanding loan amount:

Emissions are attributed to BNG based on its proportional financial involvement in the borrower's operations. For business loans, this is calculated as the outstanding

loan amount relative to the borrower's total financial needs. This ensures that reported emissions correspond to BNG's share of responsibility for the financed activities, in alignment with the PCAF methodology.

Method based on m^2:

Emissions are attributed to BNG based on the following attribution factor:

Outstanding Loan Amount (€)/ Client's Total balance sheet (€)).

Absolute vs. relative emissions

The financed GHG emissions and relative financed emissions are reported per scope. The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume in million euro of the clients for which a GHG footprint was calculated in this report.

Limitations

Limitations for education institutions with energy consumption data

For ten educational institutions data on the total balance sheet were not available. For these institutions, the total balance sheet was calculated based on the average ratio outstanding loan volume / total balance sheet. However, this may have been over- or underestimated.

The actual consumption of natural gas and electricity by the education institutions is not known. Energy consumption has been estimated based on key figures. This is less accurate than actual consumption.

Ideally, GHG emissions of cars in possession of educational institutions should also be part of scope 1. Unfortunately, these data are not available.

Some primary school buildings are in possession of municipalities. It might be possible that for some primary school buildings energy consumption is included in the GHG emissions of municipalities.

Limitations for education institutions lacking energy consumption data

Data availability: borrower-specific data are not available for all these clients. Therefore, a method with a lower PCAF data quality score has been used for eleven of them.

Data quality: PCAF recommends using the Classification Level 2 emission factors for internal analysis only. As a result, Classification level 2 cannot be used for this calculation. Within Classification level 1, it is not possible to distinguish between subsectors. This results in the reliance on the more aggregated Classification Level 1 emission factors, which introduces inherent uncertainties, particularly for sectors with high variability in emissions profiles.

Data quality estimate

Data quality score for education institutions with energy consumption data

For 71.3% of outstanding loans to this sector, the data quality score is 3. Energy consumption data are based on averaged data that is peer/(sub)-sector-specific, therefore data quality score is 3.

Data quality score for education institutions lacking energy consumption data

For 16.2% of outstanding loans to this sector, the data quality is score 4. The calculations rely on Level 4 data, GHG emissions are calculated based on an emission factor per floor area.

For 12.4% of outstanding loans to this sector, the data quality is score 5. GHG emissions were calculated based on the outstanding loan amount and an emission factor. This results in data quality score 5, reflecting the exclusive use of sector-specific emission factors in the absence of borrower-specific information.

Calculation sheets

The final overview of all the calculations for 2018, 2023 and 2024 can be found in the data files mentioned in the factsheet below.

List of the calculation sheets	Location
bBNG.tOnderwijs_Leningportefeuille.csv bDUO.tOnderwijs_PassivaBNG.csv bRepubliq.tBNG_Onderwijs_Energieverbruik_versie2025.csv emissiefactoren - PCAF 2025.csv	\Werkmap\Onderwijs\d. Data voor SQL \Werkmap\Emissiefactoren\c. Voorbewerkte data
250924_BNG_Onderwijs_2018_versie2025.ipynb 250924_BNG_Onderwijs_2023_versie2025.ipynb 250924_BNG_Onderwijs_2024.ipynb	\Werkmap\Onderwijs\e. SQL notebooks
251001 pBNG.tOnderwijs_2018_CO2voetafdruk_Absoluut_Totaal_versie2025.xlsx 251001 pBNG.tOnderwijs_2018_CO2voetafdruk_Absoluut_TypeOW_versie2025.xlsx 251001 pBNG.tOnderwijs_2018_CO2voetafdruk_Relatief_Totaal_versie2025.xlsx 251001 pBNG.tOnderwijs_2018_IndividueleKlanten_versie2025.xlsx	\Werkmap\Onderwijs\f2. Data uit SQL BNG

251001 pBNG.tOnderwijs_2018_Ratio_Lening_Passiva_versie2025.xlsx 250924 pBNG.tOnderwijs_2023_CO2voetafdruk_Absoluut_Totaal_versie2025.xlsx 250924 pBNG.tOnderwijs_2023_CO2voetafdruk_Relatief_Totaal_versie2025.xlsx 250924 pBNG.tOnderwijs_2023_IndividueleKlanten_versie2025.xlsx 250924 pBNG.tOnderwijs_2023_Ratio_Lening_Passiva_versie2025.xlsx 250924 pBNG.tOnderwijs_2024_CO2voetafdruk_Absoluut_Totaal_versie2025.xlsx 250924 pBNG.tOnderwijs_2024_CO2voetafdruk_Relatief_Totaal_versie2025.xlsx 250924 pBNG.tOnderwijs_2024_IndividueleKlanten_versie2025.xlsx 250924 pBNG.tOnderwijs_2024_Ratio_Lening_Passiva_versie2025.xlsx	
BNGDOCS-#3705647-v3-Totaaloverzicht berekende emissies door S&S _ Kredietportefeuille	\Werkmap\2_Data\2.1_Origineel met AVG\Leningportefeuille BNG\Berekeningen door BNG aangeleverd
250924 pBNG.tOnderwijs_2023 samengevoegd 250924 pBNG.tOnderwijs_2024 samengevoegd	\Werkmap\Onderwijs\f4. Berekening BNG

13 Public infrastructure: public transport

13.1 Results public transport

The public transport sector is a small sector within the loan portfolio of BNG. In 2024, the sector accounts for 1.5% of BNG's loan portfolio.

Tables 13-1 and 13-2 show the results for the public transport sector in 2023 and 2024. The GHG footprint was calculated for 100% of the public transport loan portfolio in 2024. Between 2023 and 2024, the outstanding loan volume increased by 255 million euro. The loan portfolio of clients for which a GHG footprint was calculated increased by 255 million euro as well. Between 2023 and 2024, the financed GHG emissions increased for all scopes. Total financed GHG emissions increased by 17,691 tonnes. This increase is mainly due to the increase in both scopes 1 and 3.

The relative financed GHG emissions (Table 13-2) show that the public transport sector is not a GHG intensive sector, in comparison to for example the infrastructure of spatial planning sector. This is in line with the trend for public transport to become more environmentally friendly. Since 2017, for example, all electric passenger trains have been powered by green electricity. And from 2025, all new buses must be powered by 100% renewable energy or fuel. From 2030, all buses must be completely emission-free.[66]

Table 13-1 Loan portfolio and coverage ratio of the public transport sector in 2023 and 2024

Year	Total loan portfolio (million euo)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)	Coverage ratio of total loan portfolio (%)
2023	1,153	1.3	1,153	100
2024	1,409	1.5	1,409	100

[66] Rijksoverheid (n.d.). Duurzaam openbaar vervoer (Dutch website).

Table 13-2 Absolute and relative financed GHG emissions for the public transport sector in 2023 and 2024

Scopes	Financed GHG emissions (tCO_2e/year)		Financed GHG emissions (%)		Relative financed GHG emissions (tCO_2e/million euro)	
	2023	2024	2023	2024	2023	2024
1	5,867	9,955	12.7	15.6	5.1	7.1
2	674	876	1.5	1.4	0.6	0.6
3	39,568	52,970	85.8	83.0	34.3	37.6
Total	**46,109**	**63,800**	**100.0***	**100.0***	**40.0**	**45.3**

*The sum in these columns is not always exactly 100% due to rounding per sector

13.2 Public transport approach

General factsheet

Scopes covered

For the public transport sector scopes 1, 2 and 3 are covered.

Portfolio covered

The public transport sector coverage ratio is 100% for 2023. For 36% of outstanding loans to this sector, GHG emissions from the public transport sector were determined based on data from the client's own annual reports or other reports. For 64% of outstanding loans to this sector, GHG emissions were calculated based on the outstanding loan amount and an emission factor.

Data

Loan-specific information includes:

- NACE codes: Used to classify economic activities and map loans to the corresponding sectors and subsectors.
- Outstanding loan amounts: The nominal value of loans provided to clients, which serves as the basis for emissions calculations.
- Subsector classifications: Detailed breakdowns of financed activities

Emission Factors:

Emission factors are applied according to the PCAF guidelines, using sector-specific data to estimate scope 1 (direct), scope 2 (indirect from electricity), and scope 3 (other indirect) emissions. These factors are sourced from reputable databases and methodologies, including DEFRA, FAOSTAT, IPCC EFDB, Joint European

Commission, Exiobase, and Probas. These emission factors are expressed in terms of tCO_2e per million euros financed.

Indexing of outdated climate data:

Data have been indexed based on the principle that in the adjustment of economic emissions intensities only the monetary value is adjusted, not the emissions in line with PCAF guidance. A CPI index for the Netherlands was used to adjust this.

GHG emissions from the clients:

Annual reports are used to collect the GHG emissions reported for some clients.

Grid emission factors

Grid emission factors represent the average GHG emissions associated with the generation and delivery of electricity consumed by financed organisations. For scope 2 emissions, these factors reflect the carbon intensity of the power grid in the region where the financed activities take place.

The grid emission factors are embedded in the sector-specific averages used for PCAF Classification Level 1. These factors ensure that the scope 2 emissions for the loan portfolio account for the electricity consumption of each sector, adjusted for regional variations in energy mix and grid intensity.

For this portfolio, grid emission factors are expressed as tCO_2e per million euros financed, providing a standardised approach to estimate indirect emissions from purchased electricity.

Calculation steps

For a few clients (36%), emission data from annual reports were used.

For the other clients (64%) the calculation of GHG emissions follows a standardised approach based on the PCAF methodology, utilizing the 3b method for business loans and unlisted equity to ensure consistency in the assessment of financed emissions. This methodology applies emission factors based on economic activity, using sector-specific averages provided through recognised databases. These emission factors are aligned with the primary business activities of the financed organisation and reflect emissions per unit of assets.

The 3b method ensures emissions are attributed proportionally to BNG's share of financing, relative to the borrower’s total financial needs. This approach leverages emission factors validated through established methodologies, ensuring they are consistent with the activities financed by the bank. Data quality is assessed in alignment with PCAF standard.

1. Emission factor assignment:

The NACE code of each company in the loan portfolio is used to determine the sector-specific emission factors. In addition, expert judgement was used when the mapping based on NACE codes seemed less reliable. In these cases, a better fit was made based on the subsector classification or more detailed information on the activities of the company. This information was largely derived from internal documents prepared by our credit department.

2. Loan attribution:

The GHG emissions for each loan are attributed based on the outstanding loan amount relative to the total emissions associated with the financed activity. This ensures that the emissions reflect the financial share of the organisation covered by the loan.

3. Indexing of outdated climate data:

The emission factor has been adjusted by using a CPI index for the Netherlands.

4. Financed GHG Emissions:

For each loan, emissions are calculated using the formula:

Financed GHG Emissions (tCO_2e) = Outstanding Loan Amount (€) * Emission Factor (tCO_2e/M. euro)

5. Data Quality assessment:

Each calculation is assigned a Data Quality (DQ) score based on the PCAF standards. Higher scores indicate reliance on sector averages rather than borrower-specific data.

Avoided emissions

Not applicable

Asset class specific considerations

No additional considerations

Attribution

GHG emissions are attributed to BNG based on its proportional financial involvement in the borrower's operations. For business loans, this is calculated as the outstanding loan amount relative to the borrower's total financial needs. This ensures that reported GHG emissions correspond to BNG's share of responsibility for the financed activities, in alignment with the PCAF methodology.

Absolute vs. relative emissions

For the public transport sector, the total financed GHG emissions were calculated in tonnes. The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume of the clients for which a GHG footprint was calculated in this report.

Limitations

Data availability: for many loans, client-specific data were not available. Relatively small companies do not disclose information on GHG emissions. For relatively large companies it is also not always documented how GHG emissions are calculated. It is unknown whether they have used the emission factors based on 'Tank to Wheel' or 'Well to Wheel' and whether they have subtracted their avoided emissions from the total GHG emissions. Therefore, the used GHG emissions for annual reports might be calculated by using a different method than used for current report.

Scope 3 complexity: indirect emissions, particularly for scope 3, are estimated using economic activity data, which may not fully capture the variability in emissions across borrowers.

Data quality: PCAF recommends using the Classification Level 2 emission factors for internal analysis only. As a result, Classification level 2 cannot be used for this calculation. Within Classification level 1, it is not possible to distinguish between subsectors. This results in the reliance on the more aggregated Classification Level 1 emission factors, which introduces inherent uncertainties, particularly for sectors with high variability in emissions profiles.

Data quality estimate

For 36% of outstanding loans to this sector, GHG emissions were determined based on data from the client's own annual reports or other reports. If emission data from annual reports are used, the data quality score is 1.

For 64% of outstanding loans to this sector, GHG emissions were calculated based on the outstanding loan amount and an emission factor. This results in data quality score 5, reflecting the exclusive use of sector-specific emission factors in the absence of borrower-specific information.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data file mentioned in the factsheet below.

List of the calculation sheets	Location
BNGDOCS-#3705647-v3-Totaaloverzicht berekende emissies door S&S _ Kredietportefeuille	\Werkmap\2_Data\2.1_Origineel met AVG\Leningportefeuille BNG\Berekeningen door BNG aangeleverd

14 Public infrastructure: infrastructure

14.1 Results infrastructure

The infrastructure sector is a small sector within the loan portfolio of BNG. In 2024, the sector accounts for 1.0% of BNG's loan portfolio.

Tables 14-1 and 14-2 show the results for the infrastructure sector in 2023 and 2024. The GHG footprint was calculated for 100% of the infrastructure loan portfolio in 2024. Between 2023 and 2024, the outstanding loan volume decreased by 122 million euro. The loan portfolio of clients for which a GHG footprint was calculated decreased by 122 million euro as well.

Between 2023 and 2024, the financed GHG emissions decreased for all scopes. Total financed GHG emissions decreased by 57,079 tonnes. This decrease is mainly due to the decrease in scope 3 (51,542 tonnes). The decrease in loans of clients for which a GHG footprint was calculated and the decrease in financed GHG emissions, lead to a decrease in financed GHG emissions from 255.0 to 227.2 tonnes per million euro. In conclusion, both the absolute and relative financed GHG emissions for the infrastructure sector decreased between 2023 and 2024.

The relative financed GHG emissions (Table 14-2) show that the infrastructure sector is a GHG intensive sector because it is one of the four sectors with the highest relative financed GHG emissions in BNG's loan portfolio in 2024 (waste collection and processing, infrastructure, network operators (energy, telecom) and spatial planning. The infrastructure sector includes, for example, ports and infrastructure projects. Scope 3 emissions are particularly high in this sector (82.4% of total).

Table 14-1 Loan portfolio and coverage ratio of the infrastructure sector in 2023 and 2024

Year	Total loan portfolio (million euro)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)	Coverage ratio of total loan portfolio (%)
2023	1,056	1.2	1,056	100
2024	934	1.0	934	100

Table 14-2 Absolute and relative financed GHG emissions for the infrastructure sector in 2023 and 2024

Scopes	Financed GHG emissions (tCO_2e/year)		Financed GHG emissions (%)		Relative financed GHG emissions (tCO_2e/million euro)	
	2023	2024	2023	2024	2023	2024
1	44,130	39,109	16.4	18.4	41.8	41.9
2	3,197	2,681	1.2	1.3	3.0	2.9
3	222,010	170,468	82.4	80.3	210.2	182.5
Total	**269,337**	**212,258**	**100***	**100***	**255.0**	**227.2**

*The sum in these columns is not always exactly 100% due to rounding per sector

14.2 Infrastructure approach

The general factsheet and factsheets per data source in section 13.2 (Public transport approach) explain the general approach for the infrastructure.

The coverage ratio for the infrastructure sector is 100%. For 30% of outstanding loans to this sector, GHG emissions were determined based on data from the client's own annual reports or other reports. For 70% of outstanding loans to this sector, GHG emissions were calculated based on the outstanding loan amount and emission factor.

Data quality estimate

For 30% of outstanding loans to this sector, the data quality score is 1. GHG emission data are obtained from annual reports or environmental reports verified by an accountant. Therefore, the data quality score is 1.

For 70% of outstanding loans to this sector, the data quality is score 5. GHG emissions were calculated based on the outstanding loan amount and emission factor. This results in data quality score 5, reflecting the exclusive use of sector-specific emission factors in the absence of borrower-specific information.

For the infrastructure sector, the loans of this sector were selected from the loan portfolio of 31-12-2023 and 31-12-2024.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data file mentioned in the factsheet below.

List of the calculation sheets	Location
BNGDOCS-#3705647-v3-Totaaloverzicht berekende emissies door S&S _ Kredietportefeuille	\Werkmap\2_Data\2.1_Origineel met AVG\Leningportefeuille BNG\Berekeningen door BNG aangeleverd

15 Public infrastructure: waste collection and processing

15.1 Results waste collection and processing

The waste collection and processing sector is a small sector within the loan portfolio of BNG. In 2024, the sector accounts for 0.8% of BNG's loan portfolio.

Tables 15-1 and 15-2 show the results for the waste collection and processing sector in 2023 and 2024. The GHG footprint was calculated for 100% of the waste collection and processing sector in 2024. Between 2023 and 2024, the outstanding loan volume increased by 59 million euro. The loan portfolio of clients for which a GHG footprint was calculated increased by 59 million euro as well.

Between 2023 and 2024, the financed GHG emissions decreased for scope 1 and increased for both scope 2 and 3. Total financed GHG emissions decreased by 6,034 tonnes. The decrease in scope 1 is 13,192 tonnes. The increase in scope 2 is 4,717 tonnes and in scope 3 the increase is 2,443 tonnes. With the increase in loans for which a GHG footprint was calculated, this all leads to a decrease in financed GHG emissions from 387.3 to 349.3 tonnes per million euro. In conclusion, both the total absolute and relative financed GHG emissions for the waste collection and processing sector have decreased between 2023 and 2024. This does not apply to the absolute emissions for scope 2 and 3 between 2023 and 2024.

The relative financed GHG emissions (Table 15-2) show that the waste collection and processing sector is a GHG intensive sector because it is one of the four sectors with the highest relative financed GHG emissions in BNG's loan portfolio in 2024 (waste collection and processing, infrastructure, network operators (energy, telecom) and spatial planning. Scope 1 emissions are particularly high in this sector (76.0% of total).

Table 15-1 Loan portfolio and coverage ratio of the waste collection and processing sector in 2023 and 2024

Year	Total loan portfolio (million euro)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)	Coverage ratio of total loan portfolio (%)
2023	697	0.8	697	100
2024	756	0.8	756	100

Table 15-2 Absolute and relative financed GHG emissions for the waste collection and processing sector in 2023 and 2024

Scopes	Financed GHG emissions (tCO_2e/year)		Financed GHG emissions (%)		Relative financed GHG emissions (tCO_2e/million euro)	
	2023	2024	2023	2024	2023	2024
1	213,915	200,723	79.2	76.0	306.7	265.4
2	36,031	40,748	13.3	15.4	51.7	53.9
3	20,209	22,652	7.5	8.6	29.0	30.0
Total	**270,156**	**264,122**	**100***	**100***	**387.3**	**349.3**

*The sum in these columns is not always exactly 100% due to rounding per sector

15.2 Waste collection and processing approach

See for the waste collection and processing approach the general factsheet and factsheets per data source in section 13.2 (Public transport approach).

The coverage ratio for the waste collection and processing sector is 100%. For 65% of the outstanding loans in this sector, GHG emissions were determined based on data from the client's own annual reports or other reports. For 35% of the outstanding loans in this sector, GHG emissions were calculated based on the outstanding loan amount and an emission factor.

Data quality estimate

For 65% of outstanding loans to this sector, GHG emissions were determined based on data from the client's own annual reports or other reports. If emission data from annual reports are used, the data quality score is 1.

For 35% of outstanding loans to this sector, GHG emissions were calculated based on the outstanding loan amount and an emission factor. This results in data quality

score 5, reflecting the exclusive use of sector-specific emission factors in the absence of borrower-specific information.

For the waste collection and processing sector, the loans of this sector were selected from the loan portfolio of 31-12-2023 and 31-12-2024.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data file mentioned in the factsheet below.

List of the calculation sheets	Location
BNGDOCS-#3705647-v3-Totaaloverzicht berekende emissies door S&S _ Kredietportefeuille	\Werkmap\2_Data\2.1_Origineel met AVG\Leningportefeuille BNG\Berekeningen door BNG aangeleverd

16 Public infrastructure: drinking water companies

16.1 Results drinking water companies

In 2024, the drinking water companies account for a small share of BNG's loan portfolio, representing 1.0% of the total.

16.1.1 Coverage ratio and attribution

The GHG footprint has been calculated for 99.0% of BNG's total outstanding loans to the drinking water companies in 2024, which is an increase compared to 2023. Compared to last year, the footprint for two additional clients could be calculated. Between 2019 and 2020 the calculation method for the drinking water companies has changed and the coverage ratio and GHG emissions for 2018 could not be recalculated. Therefore, 2020 is the reference year for drinking water companies instead of 2018.

The loan portfolio to the drinking water companies increased between 2023 and 2024 by 256 million euro. The loans of clients for which a GHG footprint was calculated increased by 299 million euro and the total balance sheet increased by 1.341 million euro between 2023 and 2024. Therefore, the ratio loan portfolio versus total balance sheet increased meaning the attribution to BNG increased. For 2020, 2023, and 2024, the loan portfolio and coverage ratio are shown in Table 16-1.

Table 16-1 Loan portfolio and coverage ratio and ratio loan portfolio versus total balance sheet for the drinking water companies in 2020, 2023 and 2024

Year	Total loan portfolio (million euro)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)	Coverage ratio of total loan portfolio (%)	Total balance sheet of clients for which a GHG footprint was calculated (million euro)	Ratio loan portfolio / total balance sheet of clients for which a GHG footprint was calculated*
2020	686	0.8	603	88.0	6,241	0.10
2023	677	0.8	624	92.2	6,111	0.10
2024	933	1.0	923	99.0	7,452[#]	0.12[#]

[#] This is based on 97.0% of outstanding loans to this sector in 2024

16.1.2 Financed GHG emissions

Table 16-2 shows the calculated GHG footprint results for the drinking water companies in 2020, 2023 and 2024.

Table 16-2 Absolute and relative financed GHG emissions for the drinking water companies in 2020, 2023 and 2024

Scopes	Financed GHG emissions (tCO_2e/year)			Financed GHG emissions (%)			Relative financed GHG emissions (tCO_2e/million euro)		
	2020	2023	2024	2020	2023	2024	2020	2023	2024
1	5,921	6,080	8,579	19.9	28.0	24.8	9.8	9.7	9.3
2	16,941	10,283	16,404	56.8	47.4	47.4	28.1	16.5	17.8
3	6,941	5,354	9,625	23.3	24.7	27.8	11.5	8.6	10.4
Total	**29,803**	**21,717**	**34,608**	**100.0***	**100.0***	**100.0***	**49.4**	**34.8**	**37.5**
Total 1-2	**22,862**	**16,363**	**24,983**	**76.7**	**75.3**	**72.2**	**37.9**	**26.2**	**27.1**

*The sum in these columns is not always exactly 100% due to rounding per sector

Between 2023 and 2024 the total financed GHG emissions increased by 12.891 tonnes. This increase is mainly due to the increase in loan portfolio and coverage rate. Compared to 2023, emissions are reported for two additional clients. When zooming in on the relative financed GHG emissions - therefore excluding these factors that affect the absolute financed GHG emissions – an increase can be observed of 2.7 tCO2e per million euro. The biggest increase can be seen for scope 3, for a large part due to an increase in the emissions related to chemicals. However, the relative financed GHG emissions for scope 1 decreased compared to 2023.

The primary task of the drinking water companies is to produce and deliver safe and reliable drinking water at acceptable costs. Some drinking water companies still rely on fossil fuel for purifying water and to prepare, transport and distribute drinking water. To make the drinking water chain more sustainable, drinking water companies, water boards and municipalities need to work together.

Compared to last year (2023), two emission categories have been refined. Companies can now report other fuel types used for heating besides natural gas. This change is in line with the methodology used by Vewin. Besides, drinking water utilities have been asked explicitly to report fuel used by vessels this year. This should be taken into consideration when comparing the 2023 and 2024 emission figures.

Avoided financed emissions are reported in Table 16-3. The avoided financed emissions are from self-generated green electricity that is fed back into the grid. Compared to 2023, the absolute financed emissions increased, but the relative

financed avoided emissions decreased by 0.1 tCO2e per million euro. Besides avoided emissions, drinking water utilities report financed captured emissions. These emissions are the CO_2e emissions which are captured in the water softening installations.[67] This applies to drinking water utilities that use surface water. Compared to last year, the absolute and relative financed removals increased. Both avoided and captured emissions are not included in the results in Table 9-2 but are reported separately in Table 16-3.

Table 16-3 Avoided financed GHG emissions for the drinking water companies in 2023 and 2024

Year	Financed avoided GHG emissions* (tCO_2e/year)	Relative financed avoided GHG emissions (tCO_2e/million euro)	Financed removals: GHG emissions captured in water softening installations (tCO_2e/year)	Relative financed removals: GHG emissions captured in water softening installations (tCO_2e/million euro)
2023	108	0.2	252	0.4
2024	123	0.1	508	0.6

*Avoided GHG emissions are gross avoided GHG emissions. Data to calculate net avoided emissions were not available

16.2 Drinking water companies' approach

16.2.1 Scopes 1, 2 and 3

General factsheet

Scopes covered

For the drinking water companies approach scopes 1, 2 and parts of scope 3 are covered.

[67] KWR Praktijkcodes (2023). Berekening CO2-voetafdruk van drinkwaterbedrijven (Dutch website).

Portfolio covered

The portfolio coverage ratio for this sector is 99.0%.

For 97.0% of the drinking water companies portfolio client data were available. For 2.0% of the drinking water companies portfolio no data were available, and a less accurate calculation method was used.

Data

Data used for the drinking water companies with data obtained from the client

Data to calculate the GHG emissions for scopes 1, 2 and 3 were obtained from Vewin (benchmark) and the individual drinking water companies.

Total balance sheet data are taken from the annual reports of the drinking water companies. For one drinking water company the annual financial report was not available. The total balance sheet data of this drinking water company were requested from the drinking water company itself.

Data used for the drinking water companies lacking data obtained from the client

For one drinking water company no information was obtained from the client. For this client, the GHG emissions are calculated based on the outstanding amount and a PCAF emission factor.

Loan-specific information includes:

- NACE codes: Used to classify economic activities and map loans to the corresponding sectors and subsectors.
- Outstanding loan amounts: The nominal value of loans provided to clients, which serves as the basis for GHG emissions calculations.
- Subsector classifications: Detailed breakdowns of financed activities

Emission Factors:

Emission factors are applied according to the PCAF guidelines, using sector-specific data to estimate scope 1 (direct) and scope 2 (indirect from electricity) emissions. These factors are sourced from reputable databases and methodologies, including DEFRA, FAOSTAT, IPCC EFDB, Joint European Commission, Exiobase, and Probas. These emission factors are expressed in terms of tCO_2e per million euros financed.

Indexing of outdated climate data:

Data has been indexed based on the principle that in the adjustment of economic emissions intensities only the monetary value is adjusted, not the emissions in line with PCAF guidance. A CPI index for the Netherlands was used to adjust this.

Grid emission factors

Grid emission factors for the drinking water companies with data obtained from the client

Section 2.4 provides further information on emission factors.

The following emission factors from Appendix A were used:

- Natural gas
- Global warming potential methane
- Average heating networks
- Car, unknown fuel & weight
- Public transport in general (traveled kms; type of transport unknown)
- Public transport in general (traveled kms; Bus, Tram, Metro average)
- Public transport by train (traveled kms; unknown train type)
- Petrol (E10) (NL)
- Diesel (B7) (NL)
- Bio-diesel (HVO)
- Bio-diesel (FAME)
- Bio-CNG
- Electricity (grey)
- Electricity (unknown source)
- Electricity (Wind Power/Hydropower/Solar Energy/Biomass)
- Air travel <700 km
- Air travel 700-2500 km
- Air travel >2500 km
- Bulk goods, Truck, unit with semi-trailer heavy
- LPG (NL)
- Nitrous oxide
- Propane
- Pellets from (dry) industrial waste stream (NL)/Pellets from fresh wood (NL)
- Motor, Petrol
- Bicycle
- Moped, average
- Car, Electric

Grid emission factors for the drinking water companies lacking data obtained from the client

Grid emission factors represent the average GHG emissions associated with the generation and delivery of electricity consumed by financed organisations. For scope 2 emissions, these factors reflect the carbon intensity of the power grid in the region where the financed activities take place.

The grid emission factors are embedded within the sector-specific averages used for PCAF Classification Level 1. These factors ensure that the scope 2 emissions for the loan portfolio account for the electricity consumption of each sector, adjusted for regional variations in energy mix and grid intensity.

For this portfolio, grid emission factors are expressed as tCO_2e per million euros financed, providing a standardised approach to estimate indirect emissions from purchased electricity.

Calculation steps

Calculation steps for the drinking water companies with data obtained from the client

Scope 1 contains:

- CH_4 and CO_2 emissions during extraction and treatment of groundwater
- Emissions from the use of natural gas
- Emissions from the use of aggregates
- Emissions from company cars and vessels
- Emissions from own energy generation

Methane emissions released during aeration were multiplied by the emission factor for methane.

The amount of natural gas used for heating was multiplied by the emission factor for natural gas. The amount of green gas used for heating was multiplied by the emission factor for bio-CNG.

Emissions from the use of aggregates did not need to be calculated.

To calculate the GHG emissions for the car fleet and vessels, the litres of fuel used were multiplied by the corresponding emission factor, or the kilometres driven were multiplied by the emission factor for a car of unknown fuel and weight class.

Self-generated energy for the drinking water companies is mainly produced by solar panels and the emission factor is 0. The GHG emissions of the individual scope 1 items were added together to calculate the total scope 1 GHG emissions.

Scope 2 contains:

- Indirect emissions for purchased energy.

CO2emissiefactoren.nl prescribes the use of the emission factor for grey electricity to calculate the GHG emissions for the purchase of green electricity from abroad. The amount of electricity purchased from abroad and the amount of purchased grey electricity were multiplied by the emission factor for grey electricity. Zero emissions were included for green electricity purchased from the Netherlands.

The GHG emissions of the individual scope 2 items were added together to calculate the total scope 2 GHG emissions.

Scope 3 contains:

- (Air) travel
- Chemicals
- Transport by third parties (suppliers of chemicals and materials)
- Transport of drinking water production residues
- Purchase of drinking water and/or semi-finished products if purchased from a drinking water company outside BNG's loan portfolio.

For air travel the number of kilometres was multiplied by the corresponding emission factor.

To calculate the GHG emissions for other forms of transportation (car use, train, public transport in general, motorcycle, moped or bicycle) – both business and commuting - the kilometres travelled were multiplied by the corresponding emission factor depending on the mode of transportation

Emission factors for chemicals are not described on CO2emissiefactoren.nl. Drinking water companies obtain the emission factors for chemicals from their suppliers or from another source. There is no insight into the details of chemical use of each drinking water company. Therefore, the $kgCO_2e$ for chemicals from the Vewin (benchmark) were used. It is possible that in some cases this also includes transport of chemicals, which could lead to double counting.

The GHG emissions from the transport of chemicals and other materials by third parties were calculated by multiplying the tonne-kilometres by the emission factor for bulk and goods transport (bulk goods, truck, unit with semi-trailer heavy). The emission factor used was the one most frequently used by CO2emissiefactoren.nl.

If the drinking water company purchases drinking water and/or semi-finished products from a drinking water company that is not in BNG's loan portfolio, the emissions associated with these purchases are included. No calculation was required for this step.

The GHG emissions of the individual scope 3 items were added together to calculate the total scope 3 GHG emissions.

One drinking water company only provided their total GHG emissions per scope, therefore these totals do not consist of individual items.

After calculating scopes 1, 2 and 3 GHG emissions, these GHG emissions were multiplied by the ratio of outstanding loan to total balance sheet ratio per client. For example, if the ratio of outstanding loans to total balance sheet is 25%, 25% of the drinking water company's scope 1, 2, and 3 GHG emissions are attributed to

BNG. The financed GHG emissions per company are added up to result in the total financed GHG emissions per sector.

The financed GHG emissions and relative financed emissions are reported per scope. The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume in million euro of the clients for which a GHG footprint was calculated in this report.

Calculation steps for the drinking water companies lacking data obtained from the client

Method based on outstanding amount:

The calculation of GHG emissions follows a standardised approach based on the PCAF methodology, utilizing the 3b method for business loans and unlisted equity. This method applies emission factors based on economic activity, using sector-specific averages provided through recognised databases. These emission factors are aligned with the primary business activities of the financed organisation and reflect emissions per unit of assets.

The 3b method ensures emissions are attributed proportionally to BNG's share of financing, relative to the borrower's total financial needs. This approach leverages emission factors validated through established methodologies, ensuring they are consistent with the activities financed by the bank. Data quality is assessed in alignment with PCAF standard.

1. Emission factor assignment:

The NACE code of each education institution is used to find the sector-specific emission factors.

2. Loan attribution:

The GHG emissions for each loan are attributed based on the outstanding loan amount relative to the total emissions associated with the financed activity. This ensures that the emissions reflect the financial share of the organisation covered by the loan.

3. Indexing of outdated climate data:

The emission factor has been adjusted by using a CPI index for the Netherlands.

4. Financed GHG Emissions:

For each loan, emissions are calculated using the formula:

Financed GHG Emissions (tCO_2e) = Outstanding Loan Amount (€) * Emission Factor (tCO_2e/M. Euro)

5. Data Quality assessment:

Each calculation is assigned a Data Quality (DQ) score based on the PCAF standards. Higher scores indicate reliance on sector averages rather than borrower-specific data.

Avoided emissions

Drinking water companies make investments that result in avoided emissions. If a drinking water company generates its own green electricity and feeds it into the national grid, this is reported as avoided emissions. The electricity generated is multiplied by the emission factor for grey energy.

Asset class specific considerations

The approach for drinking water companies is in line with the public loan approach in the PCAF methodology.

Attribution

Attribution for the drinking water companies with data obtained from the client

To calculate the GHG footprint according to the PCAF principles, a general approach has been developed. First, the GHG emissions of the different entities in the sector are calculated. Then, the BNG's share of the total balance sheet is used to determine the share of GHG emissions for which BNG is responsible.

$$\sum \boldsymbol{CO_2eq} \times \frac{\boldsymbol{Outstanding\ loan\ volume}}{\boldsymbol{Total\ balance\ sheet\ (equity + debt)}}$$

Finally, the individual scopes and the sum of the scopes of all individual organisations have been aggregated.

Attribution for the drinking water companies lacking data obtained from the client

Method based on outstanding loan amount:

Emissions are attributed to BNG based on its proportional financial involvement in the borrower's operations. For business loans, this is calculated as the outstanding loan amount relative to the borrower's total financial needs. This ensures that reported emissions correspond to BNG's share of responsibility for the financed activities, in alignment with the PCAF methodology.

Absolute vs. relative emissions

For the drinking water companies, the total financed GHG emissions were calculated in tonnes.

The relative financed emissions in tCO2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume of the clients for which a GHG footprint was calculated in this report.

Limitations

Limitations for the drinking water companies with data obtained from the client

The Dutch drinking water companies have published a methodology for calculating the GHG footprint.[68] This methodology is also based on the GHG Protocol. The methodology of the drinking water companies has a standard calculation approach. This approach can be extended with additional options that can be added to the calculation. Although this methodology for calculating the GHG footprint of drinking water companies has been published, there are still differences in the way the different drinking water companies calculate their own GHG footprint. One could say that the standard calculation method is a golden mean but deviates from the real GHG footprint. Scope 3, for example, is incomplete and which emissions are included in scope 1, 2 or 3 varies between the drinking water companies.

A limitation is that one drinking water company only shared the total GHG emissions per scope. These emissions are based on 'Well to Wheel' but lack the detailed information to calculate all the individual items in scopes 1, 2 and 3 based on 'Tank to Wheel'. It is not possible to make a good conversion factor based on the other drinking water companies to convert the GHG emissions based on 'Well to Wheel' to GHG emissions based on 'Tank to Wheel'. Therefore, the GHG emissions of this drinking water company were included in the calculation based on 'Well to Wheel' and results in an overestimation of the GHG emissions based on 'Tank to Wheel'.

Scope 3 has several limitations. As mentioned earlier, the emission factors for chemicals are not described on CO2emissiefactoren.nl. Drinking water companies obtain the emission factors for chemicals from their suppliers or from another source. There was no insight into the chemical details of each drinking water company. Therefore, $kgCO_2e$ for chemicals was used, which was included in the data obtained from the Vewin benchmark. It is possible that in some cases this includes transport of chemicals, which could lead to double counting.

[68] KWR Praktijkcodes (2023). Berekening CO2-voetafdruk van drinkwaterbedrijven (Dutch website).

For the transport of drinking water production residues and transport of third parties, there are several uncertainties. For this report, it is possible that a different emission factor has been used than that used by the drinking water companies, as there are several options on CO2emissiefactoren.nl in the category bulk and goods transport. It was decided to use the emission factor that CO2emissiefactoren.nl has identified as the most common.

There may also be differences in what the drinking water companies include in the transport of third parties. Some only include the transport of chemicals, others include more items. These details are not known.

If the drinking water company purchases drinking water and/or semi-finished products from a drinking water company that is not in BNG's loan portfolio, the emissions related to these purchases are based on 'Well to Wheel' and result in an overestimation of the GHG emissions based on 'Tank to Wheel'.

One of the drinking water companies in BNG's loan portfolio is owned by and operates for two other drinking water companies. The drinking water company supplies a semi-finished product to two other drinking water companies. The calculated GHG footprint of this drinking water company is included in these other drinking water companies. The loans to this drinking water company that supplies a semi-finished product to the other drinking water companies were allocated to these two drinking water companies based on the volume of water that was delivered to them compared to the total volume of water supplied to 4 clients (being the 2 drinking water companies and 2 other companies).

Limitations for the drinking water companies lacking data obtained from the client

Data availability: borrower-specific data are not available for this client. Therefore, a method with a lower PCAF data quality score has been used.

Data quality: PCAF recommends using the Classification Level 2 emission factors for internal analysis only. As a result, Classification level 2 cannot be used for this calculation. Within Classification level 1, it is not possible to distinguish between subsectors. This results in the reliance on the more aggregated Classification Level 1 emission factors, which introduces inherent uncertainties, particularly for sectors with high variability in emissions profiles.

Data quality estimate

Data quality estimate for the drinking water companies with data obtained from the client

The GHG emissions were calculated based on data provided by the water companies themselves, but the data are not audited. Therefore, the data quality score for scopes 1 and 2 is 2.

Scope 3 GHG emissions are less certain than for scopes 1 and 2 because some details are missing, e.g. distances travelled are known, but details on the means of transport are sometimes missing. Therefore, the data quality score is 3.

Data quality estimate for the drinking water companies lacking data obtained from the client

For 2.0% of outstanding loans to this sector, the data quality is score 5. GHG emissions were calculated based on the outstanding loan amount and an emission factor. This results in data quality score 5, reflecting the exclusive use of sector-specific emission factors in the absence of borrower-specific information.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data file mentioned in the factsheet below.

List of the calculation sheets	Location
250922 Waterleidingbedrijven 2024 BNG	\Werkmap\Waterleidingbedrijven\f4. Berekening BNG

17 Public infrastructure: spatial planning

17.1 Results spatial planning

The spatial planning sector is a small sector within the loan portfolio of BNG. In 2024, the sector accounts for 0.6% of BNG's loan portfolio.

Tables 17-1 and 17-2 show the results for the spatial planning sector in 2023 and 2024. The GHG footprint was calculated for 100% of the spatial planning sector in 2024. Between 2023 and 2024, the outstanding loan volume decreased by 79 million euro. The loan portfolio of clients for which a GHG footprint was calculated decreased by 79 million euro as well.

Between 2023 and 2024, the financed GHG emissions decreased for all scopes. Total financed GHG emissions decreased by 5,462 tonnes. This decrease is mainly due to the decrease in scope 3 (4,727 tonnes). The decrease in loans of clients for which a GHG footprint was calculated and the decrease in financed GHG emissions, lead to a slight increase in financed GHG emissions from 112.2 to 118.8 tonnes per million euro. This is because the loans of clients for which a GHG footprint was calculated decreased more sharply than the financed GHG emissions. In conclusion, the absolute financed GHG emissions decrease and relative financed GHG emissions for the spatial planning sector increased between 2023 and 2024.

The relative financed GHG emissions (Table 17-2) show that the spatial planning sector is a GHG intensive sector because it is one of the four sectors with the highest relative financed GHG emissions in BNG's loan portfolio in 2024 (waste collection and processing, infrastructure, network operators (energy, telecom) and spatial planning. Scope 3 emissions are particularly high in the spatial planning sector (87.0% of total).

Table 17-1 Loan portfolio and coverage ratio of the spatial planning sector in 2023 and 2024

Year	Total loan portfolio (million euro)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)	Coverage ratio of total loan portfolio (%)
2023	592	0.7	592	100
2024	513	0.6	513	100

Table 17-2 Absolute and relative financed GHG emissions for the spatial planning sector in 2023 and 2024

Scopes	Financed GHG emissions (tCO_2e/year)		Financed GHG emissions (%)		Relative financed GHG emissions (tCO_2e/million euro)	
	2023	2024	2023	2024	2023	2024
1	7,540	6,911	11.3	11.3	12.7	13.5
2	1,129	1,023	1.7	1.7	1.9	2.0
3	57,775	53,048	87.0	87.0	97.5	103.4
Total	**66,444**	**60,982**	**100.0***	**100.0***	**112.2**	**118.8**

*The sum in these columns is not always exactly 100% due to rounding per sector

17.2 Spatial planning approach

See for the spatial planning approach the general factsheet and factsheets per data source in section 13.2 (Public transport approach).

The coverage ratio for the spatial planning sector is 100%.

Data quality estimate

For 100% of outstanding loans to this sector, GHG emissions were calculated based on the outstanding loan amount and an emission factor. Therefore, the data quality score is 5, reflecting the exclusive use of sector-specific emission factors in the absence of borrower-specific information.

For the spatial planning sector, the loans of this sector were selected from the loan portfolio of 31-12-2023 and 31-12-2024.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data file mentioned in the factsheet below.

List of the calculation sheets	Location
BNGDOCS-#3705647-v3-Totaaloverzicht berekende emissies door S&S _ Kredietportefeuille	\Werkmap\2_Data\2.1_Origineel met AVG\Leningportefeuille BNG\Berekeningen door BNG aangeleverd

18 Public infrastructure: network operators (energy, telecom)

18.1 Results network operators (energy, telecom)

The network operators (energy, telecom) are a small sector within the loan portfolio of BNG. In 2024, the sector accounts for 0.3% of BNG's loan portfolio.

Tables 18-1 and 18-2 show the results for the network operators (energy, telecom) in 2023 and 2024. The GHG footprint was calculated for 100% of network operators sector in 2024. Between 2023 and 2024, the outstanding loan volume decreased by 167 million euro. The loan portfolio of clients for which a GHG footprint was calculated decreased by 167 million euro as well.

Between 2023 and 2024, the financed GHG emissions decreased for all three scopes. Total financed GHG emissions decreased by 14,973 tonnes. The decrease in scope 1 is 11,605 tonnes. The decrease in scope 2 is 263 tonnes and in scope 3 the decrease is 3,104 tonnes. Loans for which a GHG footprint was calculated decrease with 167 million euro. The absolute total absolute financed GHG emissions for the network operators sector decreased between 2023 and 2024. The relative financed GHG emissions increased. This is because the loans of clients for which a GHG footprint was calculated decreased more sharply than the financed GHG emissions.

The relative financed GHG emissions (Table 18-2) show that the network operators (energy, telecom) are a GHG intensive sector because it is one of the four sectors with the highest relative financed GHG emissions in BNG's loan portfolio in 2024 (waste collection and processing, infrastructure, network operators (energy, telecom) and spatial planning. Scope 1 emissions are particularly high in this sector (72.8% of total).

Table 18-1 Loan portfolio and coverage ratio of the network operators (energy, telecom) in 2023 and 2024

Year	Total loan portfolio (million euro)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)	Coverage ratio of total loan portfolio (%)
2023	486	0.6	486	100
2024	319	0.3	319	100

Table 18-2 Absolute and relative financed GHG emissions for the network operators (energy, telecom) in 2023 and 2024

Scopes	Financed GHG emissions (tCO_2e/year)		Financed GHG emissions (%)		Relative financed GHG emissions (tCO_2e/million euro)	
	2023	2024	2023	2024	2023	2024
1	54,718	43,112	73.7	72.8	112.6	135.1
2	2,445	2,182	3.3	3.7	5.0	6.8
3	17,062	13,958	23.0	23.6	35.1	43.7
Total	**74,225**	**59,252**	**100***	**100***	**152.7**	**185.6**

*The sum in these columns is not always exactly 100% due to rounding per sector

18.2 Network operators (energy, telecom) approach

See for the network operators (energy, telecom) approach the general factsheet and factsheets per data source in section 13.2 (Public transport approach).

The coverage ratio for the network operators (energy, telecom) sector is 100%.

Data quality estimate

For 19% of outstanding loans to this sector, GHG emissions were determined based on data from the client's own annual reports or other reports. Data quality score is 1.

For 21% of outstanding loans to this sector, GHG emissions were calculated based on production data of heating networks. Data quality score is 3.

For 60% of outstanding loans to this sector, GHG emissions were calculated based on the outstanding loan amount and an emission factor. This results in data quality

score 5, reflecting the exclusive use of sector-specific emission factors in the absence of borrower-specific information.

For the network operators (energy, telecom) sector, the loans of this sector were selected from the loan portfolio of 31-12-2023 and 31-12-2024.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data file mentioned in the factsheet below.

List of the calculation sheets	Location
BNGDOCS-#3705647-v3-Totaaloverzicht berekende emissies door S&S _ Kredietportefeuille	\Werkmap\2_Data\2.1_Origineel met AVG\Leningportefeuille BNG\Berekeningen door BNG aangeleverd

19 Others

19.1 Results other sectors

The sector 'others' is a small sector within the loan portfolio of BNG. In 2024, the sector accounts for 0.3% of BNG's loan portfolio.

Tables 19-1 and 19-2 show the results for the sector 'others' in 2023 and 2024. The GHG footprint was calculated for 100% of the 'others' sector in 2024. Between 2023 and 2024, the outstanding loan volume decreased by 14 million euro. The loan portfolio of clients for which a GHG footprint was calculated decreased by 14 million euro as well.

Between 2023 and 2024, the financed GHG emissions decreased for all scopes. Total financed GHG emissions decreased by 311 tonnes. With both the decrease in loans for which a GHG footprint was calculated, as well as a decrease in all three scopes, this leads to a decrease in financed GHG emissions from 10.9 to 10.2 tonnes per million euro. In conclusion, both the total absolute and relative financed GHG emissions for the 'others' sector has decreased between 2023 and 2024.

Table 19-1 Loan portfolio and coverage ratio of the sector 'others' in 2023 and 2024

Year	Total loan portfolio (million euro)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)	Coverage ratio of total loan portfolio (%)
2023	253	0.3	253	100
2024	239	0.3	239	100

Table 19-2 Absolute and relative financed GHG emissions for the sector 'others' in 2023 and 2024

Scopes	Financed GHG emissions (tCO_2e/year)		Financed GHG emissions (%)		Relative financed GHG emissions (tCO_2e/million euro)	
	2023	2024	2023	2024	2023	2024
1	667	654	24.2	26.7	2.6	2.7
2	164	143	6.0	5.9	0.6	0.6
3	1,926	1,649	69.9	67.4	7.6	6.9
Total	**2,758**	**2,446**	**100***	**100***	**10.9**	**10.2**

*The sum in these columns is not always exactly 100% due to rounding per sector

19.2 Other sectors approach

See for the other sectors approach the general factsheet and factsheets per data source in section 5.2 (Housing related approach).

The coverage ratio for sector ‘others’ is 100%.

Data quality estimate

For 0.2% of outstanding loans to this sector, GHG emissions were determined based on data from the client's own annual reports or other reports. Data quality score is 1. For 21% of outstanding loans to this sector, GHG emissions were determined based on data from the client's own annual reports or other reports that were not audited. Data quality score therefore is 2.

For 79% of outstanding loans to this sector, GHG emissions were calculated based on the outstanding loan amount and an emission factor. This results in data quality score 5, reflecting the exclusive use of sector-specific emission factors in the absence of borrower-specific information.

For the sector ‘others’, the loans of this sector were selected from the loan portfolio of 31-12-2023 and 31-12-2024.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data file mentioned in the factsheet below.

List of the calculation sheets	Location
BNGDOCS-#3705647-v3-Totaaloverzicht berekende emissies door S&S _ Kredietportefeuille	\Werkmap\2_Data\2.1_Origineel met AVG\Leningportefeuille BNG\Berekeningen door BNG aangeleverd

20 Energy: renewable energy

The energy sector includes the subsectors: biomass, geothermal, wind, solar and some other clients. Only the wind and solar sub-sectors are included in this chapter.

These two sub-sectors are very important for the energy transition and the reduction of GHG emissions. Investments in these sub-sectors will contribute to the greening of our national electricity grid. This chapter contains the financed GHG emissions from this sector during the production, installation, maintenance and dismantling of wind turbines and solar panels. These GHG emissions are not released gradually over the course of a year, but at specific times during their lifetime. However, they are converted to an annual basis in this report. In addition, this chapter also contains the financed avoided emissions of wind- and solar parks. Net avoided emissions are the gross avoided emissions minus emissions generated during production, installation, maintenance and dismantling.

20.1 Results wind energy

In 2024, the wind energy sector represents a share of 0.4% within BNG's loan portfolio.

20.1.1 Coverage ratio and attribution

For the wind energy sector in BNG's loan portfolio the coverage ratio of the calculated GHG footprint is 75.1%. On average, BNG finances 15% of the total assets of its clients in the wind energy sector for which GHG data was available. This means that 15% of the avoided emissions generated by these clients can be attributed to BNG.

Table 20-1 Loan portfolio, coverage ratio and ratio loan portfolio versus total balance sheet for the wind energy sector in 2023 and 2024

Year	Total loan portfolio (million euro)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)	Coverage ratio of total loan portfolio (%)	Total balance sheet of clients for which a GHG footprint was calculated (million euro)	Ratio loan portfolio / total balance sheet of clients for which a GHG footprint was calculated*
2023	403	0.5	403	100.0	3,667	0.11
2024	369	0.4	277	75.1	1,818	0.15

20.1.2 Financed GHG emissions

Total GHG emissions of all wind parks for production, installation, maintenance and dismantling were 5,507 tonnes CO_2e in 2024. This is 1,997 tonnes less than in 2023. Total gross avoided emissions for all wind parks were 299,034 tonnes CO2e for 2024 – a decrease of 33,055 tonnes in comparison with 2023. This results in net avoided emissions of 293,528 tonnes CO2e for 2024.

Table 20-2 Financed GHG emissions for the production, installation, maintenance and dismantling of wind parks and the gross and net avoided emissions by these wind parks

Year	Generated GHG emissions * (tCO_2e)	Gross avoided GHG emissions (tCO_2e)	Net avoided GHG emissions (tCO_2e)
2023	7,504	332,089	324,586
2024	5,507	299,034	293,528

*During production, installation, maintenance and dismantling

20.2 Wind energy sector approach

General factsheet

Scopes covered

Scope 3

This chapter only contains the financed GHG emissions from this sector during the production, installation, maintenance and dismantling of wind turbines. These GHG emissions are not released gradually over the course of a year, but at specific times during their lifetime. However, they are calculated and reported on an annual basis in this report. In addition, this chapter also contains the financed avoided emissions of wind parks.

Portfolio covered

The wind energy coverage ratio for 2024 is 75.1%.

Data

Data on actual energy production in 2024, type of wind turbines and total balance sheet were obtained from BNG. Data on GHG emissions from production, installation, maintenance and dismantling were obtained from the wind turbine manufacturers or, where this information was not available, from scientific literature.

Grid emission factors

The emission factor used to calculate the gross avoided GHG emissions is based on grey energy 'Well to Wheel' (WTW) of 0.536 $kgCO_2e$ /kWh in 2024. Here, the WTW emission factor is deliberately used so that the net avoided emissions could be calculated: avoided emissions minus generated emissions.

Calculation steps

First, the GHG emissions for production, installation, maintenance and dismantling were calculated using actual production in 2024. The actual production was multiplied by an emission factor that indicates how many emissions are released per kWh produced for production, installation, maintenance and dismantling. This emission factor was taken from the LCA of the wind turbine in question where possible, otherwise a general emission factor based on scientific literature was used. This resulted in the GHG emissions for production, installation, maintenance and dismantling.

Second, the avoided GHG emissions were calculated. To calculate the avoided GHG emissions, the actual energy production in 2024 was multiplied by the "Well to

Wheel" emission factor for grey electricity. This gives the total avoided GHG emissions in 2024.

After calculating the GHG emissions and the avoided GHG emissions, these GHG emissions were multiplied by the ratio of outstanding loan to total balance sheet ratio per client. For example, if the ratio of outstanding loans to total balance sheet is 25%, 25% of the emissions are attributed to BNG. The financed GHG emissions per client are added up to result in the total financed GHG emissions per sector.

The financed GHG emissions and relative financed emissions are reported per scope. The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume in million euro of the clients for which a GHG footprint was calculated in this report.

Avoided emissions

See Table 20-2

Asset class specific considerations

For the wind energy sector, the methodology of asset class 'Project finance' is followed.

Attribution

To calculate the GHG footprint according to the PCAF principles, a general approach has been developed. First, the GHG emissions of the different entities in the sector are calculated. Then, the BNG's share of the total balance sheet is used to determine the share of GHG emissions for which BNG is responsible.

$$\sum \boldsymbol{CO_2eq} \times \frac{\boldsymbol{Outstanding\ loan\ volume}}{\boldsymbol{Total\ balance\ sheet\ (equity + debt)}}$$

Finally, the individual scopes and the sum of the scopes of all individual organisations have been aggregated.

Absolute vs. relative emissions

For the wind energy sector, the total financed GHG emissions and avoided GHG emissions were calculated in tonnes. The relative financed GHG emissions and avoided GHG emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume of the clients for which a GHG footprint was calculated in this report.

Limitations

For some wind turbines, the GHG emissions in grams per kWh for production, installation, maintenance and dismantling were not known. In this case, data from scientific literature was used to determine the best value to use.

Data quality estimate

Data quality score 3. GHG emissions are calculated based on energy production data received from the wind parks themselves, but the data are not verified. Information on GHG emissions for production, installation, maintenance and dismantling is mainly obtained from scientific literature. Therefore, the data quality score is 3.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data file mentioned in the factsheet below.

List of the calculation sheets	Location
251013_Berekening_Windparken_BNG_2024	\Werkmap\Wind- en Zonneparken\BNG\f4. Berekening BNG

20.3 Results solar energy

In 2024, the solar energy sector represents a share of 0.3% within BNG's loan portfolio.

20.3.1 Coverage ratio and attribution

For the solar energy sector in BNG's loan portfolio the coverage ratio of the calculated GHG footprint is 91.9%. On average, BNG finances 69% of the total assets of its clients in the solar energy sector for which GHG data was available. This means that 69% of the avoided emissions generated by these clients can be attributed to BNG.

Table 20-3 Loan portfolio, coverage ratio and ratio loan portfolio versus total balance sheet for the solar energy sector in 2023 and 2024

Year	Total loan portfolio (million euro)	Percentage of all loans (%)	Loans of clients for which a GHG footprint was calculated (million euro)	Coverage ratio of total loan portfolio (%)	Total balance sheet of clients for which a GHG footprint was calculated (million euro)	Ratio loan portfolio / total balance sheet of clients for which a GHG footprint was calculated*
2023	287	0.3	130	45.3	194	0.67
2024	278	0.3	256	91.9	370	0.69

20.3.2 Financed GHG emissions

Total GHG emissions for all solar parks for production, installation, maintenance and dismantling were 5,859 tonnes for 2024. This is an increase of 491 tonnes in comparison to 2023. Total gross avoided emissions for the solar parks included in the calculation were 78,505 tonnes for 2024, an increase of 17,312 tonnes in comparison to 2023. This results in net avoided emissions of 72,646 tonnes CO2e for 2024.

Table 20-4 Financed GHG emissions for the production, installation, maintenance and dismantling of solar parks and the gross and net avoided emissions by these solar parks

Year	Generated GHG emissions * (tCO_2e)	Gross avoided GHG emissions (tCO_2e)	Net avoided GHG emissions (tCO_2e)
2023	5,368	61,193	55,825
2024	5,859	78,505	72,646

*During production, installation, maintenance and dismantling

20.4 Solar energy sector approach

General factsheet

Scopes covered

Scope 3

This chapter only contains the financed GHG emissions from this sector during the production, installation, maintenance and dismantling of solar panels. These GHG emissions are not released gradually over the course of a year, but at specific times during their lifetime. However, they are calculated and reported on an annual basis in this report. In addition, this chapter also contains the financed avoided GHG emissions of solar parks.

Portfolio covered

The solar energy coverage ratio for 2024 is 91.9%.

Data

Data on actual energy production in 2024 and total balance sheet were obtained from BNG. Data on GHG emissions from production, installation, maintenance and dismantling were obtained from scientific literature.

Grid emission factors

The emission factor used to calculate the gross avoided GHG emissions is based on grey energy 'Well to Wheel' (WTW) of 0.536 kgCO_2e /kWh in 2024.

Calculation steps

First, the GHG emissions for production, installation, maintenance and dismantling were calculated using actual production in 2024. The actual production was multiplied by an emission factor that indicates how many emissions are released per kWh produced for production, installation, maintenance and dismantling. This emission factor was taken from scientific literature. This resulted in the GHG emissions for production, installation, maintenance and dismantling.

Second, the avoided GHG emissions were calculated. To calculate the avoided GHG emissions, the actual energy production in 2024 was multiplied by the "Well to Wheel" emission factor for grey electricity. This gives the total avoided GHG emissions in 2024.

After calculating the GHG emissions and the avoided GHG emissions, these GHG emissions were multiplied by the ratio of outstanding loan to total balance sheet ratio per client. For example, if the ratio of outstanding loans to total balance sheet is 25%, 25% of the emissions are attributed to BNG. The financed GHG emissions per client are added up to result in the total financed GHG emissions per sector.

The financed GHG emissions and relative financed emissions are reported per scope. The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume in million euro of the clients for which a GHG footprint was calculated in this report.

Avoided emissions

See Table 20-4

Asset class specific considerations

For the solar energy sector, the methodology of asset class 'Project finance' is followed.

Attribution

To calculate the GHG footprint according to the PCAF principles, a general approach has been developed. First, the GHG emissions of the different entities in the sector are calculated. Then, the BNG's share of the total balance sheet is used to determine the share of GHG emissions for which BNG is responsible.

$$\sum \boldsymbol{CO_2eq} \times \frac{\boldsymbol{Outstanding\ loan\ volume}}{\boldsymbol{Total\ balance\ sheet\ (equity + debt)}}$$

Finally, the individual scopes and the sum of the scopes of all individual organisations have been aggregated.

Absolute vs. relative emissions

For the solar energy sector, the total financed GHG emissions and avoided GHG emissions were calculated in tonnes. The relative financed GHG emissions and avoided GHG emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume of the clients for which a GHG footprint was calculated in this report.

Limitations

For the solar panels, the GHG emissions in grams per kWh for production, installation, maintenance and dismantling were not known. In this case, data from scientific literature was used to determine the best value to use.

Data quality estimate

Data quality score 3. GHG emissions are calculated based on energy production data received from the solar parks themselves, but the data are not verified. Information on GHG emissions for production, installation, maintenance and dismantling is mainly obtained from scientific literature. Therefore, the data quality score is 3.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data file mentioned in the factsheet below.

List of the calculation sheets	Location
251013_Berekening_Zonneparken_BNG _2024.xslx	\Werkmap\Wind- en Zonneparken\BNG\f4. Berekening BNG

21 Total GHG footprint for BNG's loan portfolio for 2018, 2023 and 2024

21.1 Coverage ratio by a GHG footprint

In summary, Table 21-1 shows the overview of outstanding loan volume per sector and subsector and the coverage ratio for 2018, 2023 and 2024.

Table 21-1 Total outstanding loans of BNG and part covered in the GHG assessment for the years 2018, 2023 and 2024[69] - means no data are available

Market segment	Sector	Total loan portfolio (million euro)			Coverage ratio by GHG footprint of total loan portfolio (%)		
		2018	2023^	2024	2018	2023	2024
Housing	Social housing associations	38,947	45,957	50,013	94.0	100.0	100.0
	Housing related	496	784	884	-	100.0	100.0
Public sector	Municipalities	26,066	25,104	24,993	99.8	100.0	100.0
	Provinces	137	449	584	100.0	100.0	100.0
	Water boards	233	220	237	100.0	100.0	100.0
	Joint arrangements	1,362	1,303	1,290	-	100.0	100.0
	Other public institutions	768	510	493	-	100.0	100.0
Healthcare	Healthcare	7,031	6,629	6,329	87.7	100.0	99.7
Education	Educational institutions	979	1,035	1,002	55.9	100.0	100.0
Public infrastructure	Public transport	909	1,153	1,409	-	100.0	100.0
	Infrastructure	1,220	1,056	934	72.6	100.0	100.0
	Waste collection and processing	754	697	756	-	100.0	100.0
	Drinking water companies#	811	677	933	-	92.2	99.0
	Spatial planning	754	592	513	-	100.0	100.0
	Network operators (energy, telecom)	451	486	319	-	100.0	100.0
Others	Others	381	253	239	-	100.0	100.0
Energy	Wind and solar energy	255	690	724	-	77.2	82.3
	Biomass and geothermal	54	118	76	-	-	-
	Sustainability projects	19	52	49	-	-	-
Total	**All sectors**	**81,629***	**87,766***	**91,702***	**86.4**	**99.6**	**99.7**

[69] Reference date for the year 2024 is 31-12-2024, reference date for the year 2023 is 31-12-2023, and reference date for the year 2018 is 31-12-2018.

^ The current report does not include data for 2019, 2020, 2021 and 2022. It is decided to calculate 3 years: The reference year (2018) and the two most recent years, 2023 and 2024.

For drinking water companies, the reference year is not 2018, but 2020. Sector specific data are presented in chapter 16.

* Due to rounding, the figures and sums in these columns may not correspond exactly to the numbers presented in the report.

Between 2023 and 2024, the loan portfolio increased by 3.935 million euros. The part of the loan portfolio covered with a calculated GHG footprint has increased compared to 2023 (from 86,856 million euro in 2023 to 90,900 million euro in 2024; Table 21-2). The coverage ratio of the calculated GHG footprint increased by 0.1%pt to 99.7%. This increase in coverage ratio is due to an improved coverage ratio within sectors educational institutions, drinking water companies and renewable energy.

The calculated GHG footprint is now more complete, but a challenge remains to improve the data quality in the coming years. Although the coverage ratio for 2024 is 99.7%, not all sectors in Table 21-2 include scope 1, 2 and 3 emissions. Where scope 3 emissions are included, these are not always complete, for instance, in sectors such as healthcare.

Calculating the GHG footprint based on outstanding loans or revenue is less accurate and is of poorer data quality.

21.2 Financed GHG emissions of BNG's loan portfolio

The calculated GHG footprint results for the total outstanding loans of BNG in 2018, 2023 and 2024 are shown in Table 21-2.

The absolute GHG emissions presented in Table 21-2 depend on the following factors:

- Loan volume
- Coverage ratio
- Completeness of the scopes
- Ratio outstanding loan / total balance sheet (attribution to BNG)
- Emission factors
- Change in methodology that cannot be applied retrospectively
- Absolute GHG emissions of the clients (behaviour/decisions/size of building).

Table 21-2 shows that for 99.7% of BNG's loan portfolio, the total financed GHG emissions are 2,363,094 tCO2e, the relative financed GHG emissions are 26.0 tCO2e per million euro and the overall data quality score is 2.7 on a scale of 1 (best) to 5 (poor).

Most sectors in this year's report did not have any changes in methodology and can therefore be compared to the 2023 GHG emissions.

Due to the addition of new sectors in this year's report and a further increase in the coverage ratio, it is not possible to make a direct comparison with the 2018 figures. However, it is possible to make a direct comparison for most sectors between 2023 and 2024. This comparison shows that total financed emissions decreased by 53,490 tCO_2e, while relative financed GHG emissions fell from 27.8 tCO_2e per million euros to 26.0 tCO_2e per million euros (Table S-2).

BNG has set targets under its climate action plan for the sectors social housing, municipalities, healthcare and education. When examining Scope 1 and 2 emissions for these sectors in relation to the surface shows that for both the social housing and municipalities sectors, financed GHG emissions per financed square metre increased between 2023 and 2024. A year-on-year comparison for the healthcare sector cannot be made due to methodological changes. Within the four sectors, social housing exhibits the lowest financed GHG emissions per financed square metre (22.1 $kgCO_2e/m^2$; 2024), while healthcare institutions show the highest (46.1 $kgCO_2e/m^2$; 2024).

Table 21-2 Absolute and relative financed GHG emissions for the years 2018, 2023 and 2024. - means no data are available

Market segment	Sector	Scopes	Loans of clients for which a GHG footprint was calculated (million euro)			Financed GHG emissions (ktCO2e)			Relative financed GHG emissions (tCO2e/million euro)			Data quality *
			2018	2023^	2024	2018	2023	2024	2018	2023	2024	2024
Housing	Social housing associations*	1-2	36,617	45,957	50,013	635	459	522	17.3	10.0	10.4	2.0
	Housing related	1-2-3	-	784	884	-	5	6	-	6.9	6.3	5.0
Public sector	Municipalities*	1-2-3	26,006	25,104	24,993	1002	842	835	38.5	33.6	33.4	3.8
	Provinces	1-2-3	137	449	584	9	13	19	63.6	27.9	33.1	4.0
	Water boards	1-2-3	233	220	237	34	14	16	144.4	64.6	66.2	2.8
	Joint arrangements	1-2-3	-	1,303	1,290	-	86	80	-	66.1	62.0	5.0
	Other public institutions	1-2-3	-	510	493	-	32	30	-	62.7	61.5	5.0
Health-care	Healthcare*	1-2-3	6,167	6,629	6,310	285	200	145	46.3	30.2	23.0	2.6
Edu-cation	Educational institutions*	1-2	547	1,035	1,002	13	14	13	24.4	13.7	12.9	3.4
Public infra-structure	Public transport	1-2-3	-	1,153	1,409	-	46	64	-	40.0	45.3	3.6
	Infrastructure	1-2-3	885	1,056	934	14	269	212	15.8	255.0	227.2	3.8
	Waste collection and processing	1-2-3	-	697	756	-	270	264	-	387.3	349.3	2.6
	Drinking water companies	1-2-3	-	624	923	-	22	35	-	34.8	37.5	2.3
	Spatial planning	1-2-3	-	592	513	-	66	61	-	112.2	118.8	5.0
	Network operators (energy, telecom)	1-2-3	-	486	319	-	74	59	-	152.7	185.6	4.0
Others	Others	1-2-3	-	253	239	-	3	2	-	10.9	10.2	4.0
Energy	Renewable energy#	3	-	533	533	-	-	-	-	-	-	
Total	**All Sectors**	**1-2-3**	**70,559**	**86,856**	**90,900**	**1,992**	**2,417**	**2,363**	**28.2**	**27.8**	**26.0**	**2.7**

Most of the newly added sectors have high financed GHG emissions per million euro (relative GHG emissions). This is partly because these sectors all report (part of) their scope 3 GHG emissions, which is not yet the case for the social housing and education sector which have been calculated since 2018. The sectors with the highest relative financed GHG emissions are waste collection and processing, infrastructure, network operators (energy, telecom) and spatial planning. Together, these sectors cover just 2.8% of BNG's loan portfolio, but the financed GHG emissions are 25.2% compared to the total emissions. For some of these sectors, scope 1 or 3 emissions are particularly high, while scope 2 emissions are relatively low. For the new sectors, BNG's aim is to improve data quality in the coming years and to monitor whether GHG emissions per million euro are decreasing.

As mentioned in section 2.3, the data quality score for scope 3 is mostly 4 or 5. Therefore, the data used to calculate scope 3 financed GHG emissions are of lower quality than the data used to calculate scope 1 and 2 financed GHG emissions. For this reason, Table 21-3 shows the financed GHG emissions for scopes 1 and 2 separately from scope 3. For all three years, scope 1 and 2 financed GHG emissions account for between 51% and 58% of total financed GHG emissions.

Table 21-3 Absolute and relative financed GHG emissions for scope 1-2 for the years 2018, 2023 and 2024. - means no data are available.

Market segment	Sector	Financed GHG emissions (tCO2e)			Relative financed GHG emissions (tCO2e/million euro)		
		2018	2023	2024	2018	2023	2024
Housing	Social housing associations	635,242	458,990	521,577	17.3	10.0	10.4
	Housing related	-	1,030	1,096	-	1.3	1.2
Public sector	Municipalities	209,293	166,467	154,656	8.0	6.6	6.2
	Provinces	445	721	879	3.3	1.6	1.5
	Water boards	30,354	12,393	13,696	130.2	56.3	57.7
	Joint arrangements	-	33,458	31,044	-	25.7	24.1
	Other public institutions	-	12,334	11,707	-	24.2	23.7
Healthcare	Healthcare	232,187	171,137	106,669	37.7	25.8	16.9
Education	Educational institutions	13,354	14,182	12,925	24.4	13.7	12.9
Public infrastructure	Public transport	-	6,541	10,830	-	5.7	7.7
	Infrastructure	14,017	47,327	41,790	-	44.8	44.7
	Waste collection and processing	-	249,947	241,470	-	358.4	319.3
	Drinking water companies	-	16,363	24,983	-	26.2	27.1
	Spatial planning	-	8,669	7,934	-	14.6	15.5
	Network operators (energy, telecom)	-	57,163	45,294	-	117.6	141.9
Others	Others	-	831	797	-	3.3	3.3
Total	**All Sectors**	**1,134,892**	**1,257,555**	**1,227,350**	**16.1**	**14.5**	**13.5**

Table 21-4 Absolute and relative financed GHG emissions for scope 3 for the years 2018, 2023 and 2024. - means no data are available.

Market segment	Sector	Financed GHG emissions (tCO2e)			Relative financed GHG emissions (tCO2e/million euro)		
		2018	2023	2024	2018	2023	2024
Housing	Social housing associations	-	-	-	-	-	-
	Housing related	-	4,364	4,479	-	5.6	5.1
Public sector	Municipalities	792,474	675,974	680,519	30.5	26.9	27.2
	Provinces	8,258	11,825	18,441	60.4	26.3	31.6
	Water boards	3,323	1,821	2,014	14.3	8.3	8.5
	Joint arrangements	-	52,717	49,014	-	40.4	38.0
	Other public institutions	-	19,674	18,645	-	38.6	37.8
Healthcare	Healthcare	53,058	28,748	38,261	8.6	4.3	6.1
Education	Educational institutions	-	-	-	-	-	-
Public infrastructure	Public transport	-	39,568	52,970	-	34.3	37.6
	Infrastructure	-	222,010	170,468	-	210.2	182.5
	Waste collection and processing	-	20,209	22,652	-	29.0	30.0
	Drinking water companies	-	5,354	9,625	-	8.6	10.4
	Spatial planning	-	57,775	53,048	-	97.5	103.4
	Network operators (energy, telecom)	-	17,062	13,958	-	35.1	43.7
Others	Others	-	1,926	1,649	-	7.6	6.9
Total	**All Sectors**	**857,114**	**1,159,027**	**1,135,744**	**12.1**	**13.3**	**12.5**

BNG finances renewable energy projects such as wind- and solar parks. These projects displace emissions that would have occurred without these projects. The net avoided emissions (gross avoided emissions - GHG emissions for production, installation, maintenance and dismantling) of these projects demonstrate a quantifiable positive contribution to decarbonisation. The net financed avoided GHG emissions were calculated for 73.6% of the renewable energy sector in BNG's loan portfolio in 2024. Besides the financed energy projects, it is also known which housing associations and drinking water companies generate their own green electricity and how much they feed back into the public grid. For both sectors, the financed absolute avoided GHG emissions increased compared to last year. Overall, the net financed avoided GHG emissions of all three sectors together are 16.7% of the financed generated GHG emissions (393,385 tCO_2e avoided versus 2,363,0 tCO_2e

generated). As avoided emissions should be reported separately, these figures are shown separately in Table 21-5.

Table 21-5 Absolute and relative financed avoided GHG emissions for 2023 and 2024

Market segment	Sector	Loans of clients for which a GHG footprint was calculated (million euro)		Financed avoided GHG emissions (tCO_2e) *		Relative financed avoided GHG emissions (tCO_2e/million euro)		Data quality**
		2023^	2024	2023	2024	2023	2024	2024
Housing	Social housing associations	45,957	50,013	15,097	27,088	0.3	0.5	2.0
Public infrastructure	Drinking water companies	624	923	108	123	0.2	0.1	2.0
Energy	Renewable energy	533	533	380,411	366,174	714.3	687.2	3.0
Total	**All Sectors**	**47,114**	**51,469**	**395,615**	**393,385**	**8.4**	**7.6**	**2.9**

*GHG emissions from renewable energy are net avoided emissions, but for social housing associations and drinking water companies GHG emissions are gross avoided emissions as data to calculate net avoided emissions were not available.

**More details about the data quality score can be found in sections 4.2, 16.2, 20.2 and 20.4.

External factors will always have an impact on GHG emissions. In the last six years, events such as the COVID-19 crisis and the conflicts in the world have affected energy prices, energy consumption and travel patterns. Changes in weather conditions, especially in winter, can have an impact on GHG emissions, as colder temperatures often lead to increased heating demand and higher energy consumption. The energy consumption of social housing associations, municipalities, healthcare, and education institutions has been adjusted for weather conditions. In other sectors, however, the figures are not corrected. For instance, rainfall affects the energy use of water boards, as wetter conditions increase the amount of water that must be treated and pumped, leading to higher energy demand. Long term monitoring of the GHG footprint of BNG's loan portfolio will show whether the reduction is temporary, e.g. due to external factors, or whether it is a long-term positive development due to structural changes in behaviour or investments in sustainable energy sources and/or investments in more sustainable real estate.

This year, 99.7% of BNG's loan portfolio is included in the calculated GHG footprint. Now that the coverage ratio is close to 100%, the focus in the coming years will be more on improving data quality and making scope 3 more complete. This improvement will also affect comparability with previous years, but the most important aim is to have the GHG footprint as complete as possible and to reduce it.

22 Total GHG footprint of BNG's bonds and medium-term notes for 2023 and 2024

BNG not only finances organisations through loans, but also through marketable debt securities. This year financed GHG emissions were calculated for 61.7% of the bond and medium-term notes portfolio. This chapter presents the financed GHG emissions from its bonds and medium-term notes.

22.1 Coverage ratio by a GHG footprint

BNG holds debt securities of sovereigns, supranationals and multilateral development banks, municipalities, corporates, others and structured bonds and medium-term notes. Table 22-1 shows the outstanding amounts and coverage ratio of the calculated GHG footprint by the type of bonds and medium-term notes. For all bonds and medium-term notes except for structured bonds and medium-term notes, the outstanding amounts increased between 2023 and 2024 (Table 22-1).

The coverage ratio of the calculated GHG footprint of the bonds and medium-term notes is 61.7% for 2024 (Table 22-1). For these bonds and medium-term notes the total outstanding amounts for which a GHG footprint was calculated increased by 3,800 million euro.

Table 22-1 Total outstanding value and coverage ratio of the bonds and medium-term notes in the GHG assessment for the years 2023 and 2024[70]

Type of bonds and medium-term notes	Total outstanding value (million euro)		Coverage ratio by GHG footprint of total bonds and medium-term notes (%)	
	2023	2024	2023	2024
Issued by municipalities	1,247	1,286	99.9	100.0
Issued by corporates	1,572	1,975	27.7	100.0
Structured bonds and medium-term notes	7,483	6,652	0.0	0.0
Other	791	1,260	0.0	0.0
Total excl. sovereigns	**11,093**	**11,173**	**15.2**	**29.2**
Issued by sovereigns, supranationals and Multilateral Development Banks (MDB)	9,270	10,781	87.1	95.5
Total incl. sovereigns	**20,363**	**21,954**	**47.9**	**61.7**

22.2 Financed GHG emissions of BNG's bonds and medium-term notes

Total financed GHG emissions for the bonds and medium-term notes issued by sovereigns, supranationals and multilateral development banks (excl. LULUCF) are 1,900,587 tCO_2e, the relative financed GHG emissions are 184.6 tCO_2e per million euro and the overall data quality score is 3.3 on a scale of 1 (best) to 5 (poor). Total financed GHG emissions increased by 10,629 tCO_2e between 2023 and 2024 (Table 22-2a). For these bonds, scope 1 and 2 decreased between 2023 and 2024 and scope 3 increased between 2023 and 2024. Total relative financed GHG emissions excluding and including LULUCF decreased by 49.5 tCO_2e per million euro and 31.5 tCO_2e per million euro, respectively between 2023 and 2024 (Table 22-2a and 22-2b). This shows that GHG emissions per million euro have reduced. These bonds and medium-term notes are relatively CO_2 intensive (relatively high CO_2e per million euros). It will be interesting to see if this will be reduced in the coming years.

[70] Reference date for the year 2024 is 31-12-2024, reference date for the year 2023 is 31-12-2023, and reference date for the year 2018 is 31-12-2018.

Table 22-2a Absolute and relative financed GHG emissions for bonds and medium-term notes issued by sovereigns, supranationals and multilateral development banks in the years 2023 and 2024 excl. LULUCF. – means no data are available

Type of bonds and medium-term notes	Scopes	Bonds and medium-term notes for which a GHG footprint was calculated (million euro)		Financed GHG emissions (tCO2e)		Relative financed GHG emissions (tCO2e/million euro)		Data quality*
		2023	2024	2023	2024	2023	2024	2024
Issued by sovereigns, supranationals and Multilateral Development Banks (MDB) excl. LULUCF**	1	-	-	1,303,109	1,240,537	161.4	120.5	3.0
Issued by sovereigns, supranationals and Multilateral Development Banks (MDB)	2	-	-	16,860	14,695	2.1	1.4	4.0
Issued by sovereigns, supranationals and Multilateral Development Banks (MDB)	3	-	-	569,989	645,354	70.6	62.7	4.0
Total excl. LULUCF	**1-2-3**	**8,074**	**10,294**	**1,889,958**	**1,900,587**	**234.1**	**184.6**	**3.3**

Table 22-2b Absolute and relative financed GHG emissions for bonds and medium-term notes issued by sovereigns, supranationals and multilateral development banks in the years 2023 and 2024 incl. LULUCF. - means no data are available

Type of bonds and medium-term notes	Scopes	Bonds and medium-term notes for which a GHG footprint was calculated (million euro)		Financed GHG emissions (tCO2e)		Relative financed GHG emissions (tCO2e/ million euro)		Data quality *
		2023	2024	2023	2024	2023	2024	2024
Issued by sovereigns, supranationals and Multilateral Development Banks (MDB) incl. LULUCF**	1	-	-	1,216,840	1,314,890	150.7	127.7	3.0
Issued by sovereigns, supranationals and Multilateral Development Banks (MDB)	2	-	-	16,860	14,695	2.1	1.4	4.0
Issued by sovereigns, supranationals and Multilateral Development Banks (MDB)	3	-	-	569,989	645,354	70.6	62.7	4.0
Total incl. LULUCF	**1-2-3**	**8,074**	**10,294**	**1,803,689**	**1,974,940**	**223.4**	**191.9**	**3.3**

Total financed GHG emissions for the bonds and medium-term notes issued by municipalities are 27,717 tCO_2e, the relative financed GHG emissions are 21.6 tCO_2e per million euro and the overall data quality score is 3.9 on a scale of 1 (best) to 5 (poor). Total financed GHG emissions for bonds issued by municipalities, issued by corporates, structured bonds and medium-term notes and others increased by 196,823 tCO_2e between 2023 and 2024 (Table 22-3). For municipal bonds and medium-term notes total financed GHG emissions decreased due to an increase in scope 3 emissions. Scope 3 emissions increased due to an increase in the expenditure on procurement of goods and services between 2023 and 2024. The large increase in coverage rate for corporate bonds (27.7 in 2023 to 100 in 2024) needs to be taken into account when looking at the absolute GHG emissions. The relative GHG emissions show a large decrease.

The total relative financed GHG emissions also increased by 19.9 tCO_2e per million euro between 2023 and 2024 (Table 22-3). This shows that GHG emissions per million euro have increased.

Table 22-3 Absolute and relative financed GHG emissions for bonds and medium-term notes issued by municipalities, issued by corporates, structured bonds and medium-term notes and others for 2023 and 2024. - means no data are available

Type of bonds and medium-term notes	Scopes	Bonds and medium-term notes for which a GHG footprint was calculated (million euro)		Financed GHG emissions (tCO2e)		Relative financed GHG emissions (tCO2e/million euro)		Data quality*
		2023	2024	2023	2024	2023	2024	2024
Issued by municipalities	1-2-3	1,246	1,286	29,974	27,717	24.1	21.6	3.9
Issued by corporates	1-2-3	436	1,975	110,401	309,481	253.2	156.7	1.7
Structured bonds and medium-term notes (mtn)	1-2-3	-	-	-	-	-	-	-
Other	1-2-3	-	-	-	-	-	-	-
Total	**1-2-3**	**1,682**	**3,261**	**140,375**	**337,198**	**83.5**	**103.4**	**1.8**

22.3 Municipality bonds and medium-term notes approach

See for the municipality bonds and medium-term notes approach the general factsheet and factsheets per data source in section 6.2 (Public sector: municipalities approach). For the calculation of the financed GHG emissions, the outstanding bonds and medium-term notes are used in relation to the total balance sheet, rather than the outstanding loans of the loan portfolio.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data files mentioned in the factsheet below.

List of the calculation sheets	Location
250925 energiedata BNG onder elkaar gezet.xlsx 250902 bewerking aantal banen sector O gemeente.xlsx 250902 berekening sbi 8411 zonder provincie 2024.xlsx 250919 leningportefeuille BNG gemeente 2018.xlsx	\Werkmap\Gemeenten\c. Voorbewerkte data
bBNG.tGemeente_Leningportefeuille_Bondss.csv bCBSstatline.tGemeente_Passiva.csv bGemeenteBerekeningen.tGemeente_Scope3_versie2025.csv bLISA.tGemeente_Banen_sbi8411.csv bLISA.tGemeente_Banen_SectorO.csv bRepubliq.tBNG_Gemeente_Energieverbruik_versie2025.csv	\Werkmap\Gemeenten\d. Data voor SQL
250925_BNG_Gemeente_bonds_2023_versie2025.ipynb 250925_BNG_Gemeente_bonds_2023_versie2025.ipynb	\Werkmap\Gemeenten\e. SQL notebooks\BNG
250930 pBNG.tGemeente_2023_Ratio_Lening_Passiva_Bonds_versie2025.xlsx 250930 pBNG.tGemeente_2023_IndividueleKlanten_Bonds_versie2025.xlsx 250930 pBNG.tGemeente_2023_CO2voetafdruk_Relatief_Totaal_Bonds_versie2025.xlsx	\Werkmap\Gemeenten\f2. Data uit SQL BNG

250930 pBNG.tGemeente_2023_CO2voetafdruk_Absoluut_Totaal_Bonds_versie2025.xlsx 251008 pBNG.tGemeente_2024_Ratio_Lening_Passiva_Bonds_versie2025.xlsx 251008 pBNG.tGemeente_2024_IndividueleKlanten_Bonds_versie2025.xlsx 251008 pBNG.tGemeente_2024_CO2voetafdruk_Relatief_Totaal_Bonds_versie2025.xlsx 251008 pBNG.tGemeente_2024_CO2voetafdruk_Absoluut_Totaal_Bonds_versie2025.xlsx	
251006 scope 3 gemeente 2024.xlsx	\Werkmap\Gemeenten\f4. Berekening BNG

22.4 Corporate bonds and structured bonds and medium-term notes approach

General factsheets

Scopes covered

For the corporate bonds and structured bonds and medium-term notes, scopes 1 and 2 are covered.

Portfolio covered

The coverage rate of corporate bonds is 100%. For structured bonds and medium notes the coverage rate is 0%.

Data

Annual reports are used to collect the GHG emissions reported by the companies in the corporate bonds and structure bonds and medium-term notes portfolio.

Grid emission factors

No emission factors are used.

Calculation steps

Emissions and balance sheet totals over 2024 are collected from the annual reports. In case the metric of the reported emissions differs from tCO_2e, the emissions are converted to tCO_2e.

Avoided emissions
Not applicable

Asset class specific considerations
No additional considerations

Attribution
The attribution factor is used to determine which part of the emissions BNG Bank is accountable for:

Outstanding nominal amount (€) / Total balance sheet of the company (€)

In the end, the separate scopes and the sum of the scopes of all individual organisations were aggregated.

Absolute vs. relative emissions
For the corporate bonds and structure products bonds and medium-term notes, the total financed GHG emissions were calculated in tonnes. The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume of the clients for which a GHG footprint was calculated in this report.

Limitations
It is not always documented how GHG emissions are calculated. It is unknown whether the used emission factors are based on ‘Tank to Wheel’ or ‘Well to Wheel’ and whether avoided emissions were subtracted from the total GHG emissions. Therefore, the used GHG emissions from the annual reports might be calculated by using a different method than used for current report.

Data quality estimate
For 83% of outstanding bonds, GHG emissions were determined based on data from the client's own annual reports or other reports. If emission data from annual reports are used, the data quality score is 1.

For 17% of outstanding bonds, GHG emissions were calculated based on the outstanding loan amount and an emission factor. This results in data quality score 5, reflecting the exclusive use of sector-specific emission factors in the absence of borrower-specific information.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data file mentioned in the factsheet below.

List of the calculation sheets	Location
3707745-v1-Totaaloverzicht berekende emissies door S&S _ Obligatie- en MTN portefeuille.xlsx	\Werkmap\2_Data\2.1_Origineel met AVG\Leningportefeuille BNG\Berekeningen door BNG aangeleverd

22.5 Sovereigns and supranationals and multilateral development banks approach

General factsheet

Scopes covered

For the sovereigns, scopes 1, 2 and 3 are covered. For the supranationals and multilateral development banks (MDB), only scope 1 is covered, due to the lack of data.

The scope 1 emissions are defined in the PCAF Financed Emissions Standard as “domestic GHG emissions from sources located within the country territory.” These direct (scope 1) GHG emissions are attributable to emissions generated within a countries’ boundaries and includes emissions from exported goods and services. As described by the PCAF Financed Emissions Standard, the scope 1 definition aligns with the definition of production emissions. Production emissions are emissions attributable to emissions produced domestically and include domestic consumption and exports.

The scope 2 emissions are defined in the PCAF Financed Emissions Standard as “GHG emissions occurring as a consequence of the domestic use of grid-supplied electricity, heat, steam and/or cooling which is imported from another territory.” Scope 2 are emissions attributable to the import, of electricity, steam, heat and cooling from outside the country territory.

The scope 3 emissions are defined in the PCAF Financed Emissions Standard as “GHG emissions attributable to non-energy imports as a result of activities taking place within the country territory.” These emissions are related to all other imports from goods or services from outside the country territory except for the energy related emissions included in scope 2.

Due to the data availability of different sources, scope 1 emissions are provided in CO_2e and scope 2 and 3 emissions in CO_2.

Portfolio covered

The coverage for scope 1 (both incl. and excl. LULUCF) is 83%. The scope 2 coverage is 37% and the coverage for scope 3 is 44%.

Data

Outstanding nominal amounts of the sovereigns, supranationals and multilateral development banks in the 2023 and 2024 portfolio. This includes investment balances at the end of each year.

Emission factors are used from the PCAF database:

- Sovereigns

The source of the scope 1 emissions is United Nations Framework Convention on Climate Change (UNFCCC). For the countries that report GHG emissions annually to the UNFCCC, scope 1 emissions (incl. and excl. LULUCF) were extracted from UNFCCC and divided by the countries' PPP-adjusted GDP (from World Bank) to obtain emission intensities per M. international $. The database includes CO2e emission factors for scope 1, both including and excluding land use, land-use change, and forestry (LULUCF). The metric of the emission factor is tCO_2e/M int. $.

Scopes 2 and 3 emissions are derived from indicators provided in the OECD tool. Annual CO_2 emissions are divided by the countries' PPP-adjusted GDP (from World Bank) to obtain CO_2 emission intensities per M. international $. As only CO_2 data are available the metric of the emission factor is tCO_2/M int. $.

- Supranationals and agencies:

Scope 1 emission factors based on 2020 supranational data aligned with PCAF guidelines. This concerns supranational production emissions per PPP-adjusted GDP. The metric of the emission factor is tCO_2e/M int. $. Due to lack of data, only scope 1 emissions are included in the calculations.

Indexing of outdated climate data

Data has been indexed based on the principle that in the adjustment of economic emissions intensities only the monetary value is adjusted, not the emissions in line with PCAF guidance. A CPI index for the Netherlands was used to adjust this. This indexation factor is available for each combination of base year of the emission factor and reporting year.

Currency conversion

Because the emission factors are based on USD and the outstanding nominal amounts of the bond and medium-term notes's portfolio are in euros, a currency conversion factor is used to adjust the emission factors. Because the exact date of the emission factor is unknown, an average annual currency conversion factors have been used equal to the base year of the emission factor.

Grid emission factors

While not directly applicable to sovereign debt, grid-specific emission factors are embedded within the country-level scope 2 emission factors provided by PCAF. These factors represent the average grid emissions associated with electricity, heat, and cooling consumption across sovereign regions. They are essential for calculating the indirect emissions of sovereigns, reflecting national energy consumption patterns and grid mixes.

Calculation steps

1. Portfolio attribution:

- Emissions are attributed to BNG's financial involvement in each sovereign or agency based on outstanding amounts in euros.
- Emissions are proportionally calculated for each scope (1, 2 and 3) using tailored emission factors. For de supranationals and MDB's, only scope 1 emissions are calculated.

2. Emission Factor application:

- Scope 1: Uses PCAF methodology Option 1 when direct national emission data are available, or Option 3b for proxy data based on GDP-adjusted metrics.
- Scopes 2 and 3: Applies PCAF methodology Option 3a.

3. Use of proxy data: For missing or incomplete country-specific data, proxy emission factors from OECD or supranational data sources are applied.

-

4. Adjustment of the emission factors:
   Scope-specific emission factors (provided in tCO_2e/Million USD for scope 1 and tCO_2/Million USD for scope 2 and 3) are divided by the USD-to-EUR conversion rate and the inflation factor corresponding to the base year of the emission factor and the reporting year.

5. Calculating the financed emissions:
   The following formula is used for calculating the finance ed emissions:

   Financed GHG Emissions (tCO_2e) = Adjusted emission factor * (Outstanding Amount (EUR)/10^6)

6. Distinct treatment of agencies: agencies are treated similarly to sovereign entities in terms of emission factors and methodology. This ensures consistency across the portfolio.

Avoided emissions

Not applicable

Asset class specific considerations

No additional considerations

Attribution

Emissions for sovereigns, supranationals and agencies are attributed proportionally to the outstanding nominal amount of the loan or investment as a share of the total financed asset. For sovereign debt, emissions are allocated based on the share of financing relative to the country's GDP or total outstanding debt.

Absolute vs. relative emissions

The total financed GHG emissions were calculated in tonnes. The relative financed emissions in tCO_2e / million euro were calculated by dividing the financed GHG emissions by the outstanding loan volume of the clients for which a GHG footprint was calculated in this report.

Limitations

Data availability: for many supranationals and MDB's, granular emission data rely on proxies or regional averages due to limited reporting.

Temporal mismatch: scope 2 and Scope 3 emission factors are derived from datasets of 2018, introducing potential inaccuracies.

Sector aggregation: MDB's are treated similarly to sovereigns, which may generalize emissions profiles for entities with diverse operational scopes.

Grid emissions: scope 2 factors rely on average grid emissions, which may not fully capture specific national or regional energy consumption patterns.

Data quality estimate

Sovereigns3

Data quality for scope 1 is estimated at 3.0. Data quality for scope 2 is estimated at 4.0 and for scope 3 data quality is estimated at 4.0 This results in a data quality score of 3.3.

Calculation sheets

The final overview of all the calculations for 2024 can be found in the data file mentioned in the factsheet below.

List of the calculation sheets	Location
BNGDOCS-#3706280-v2-Emissieberekening 2024 Sovereign debt.xlsx	\Werkmap\2_Data\2.1_Origineel met AVG\Leningportefeuille BNG\Berekeningen door BNG aangeleverd

Appendix A: Emission factors used per data year

Emission factors used per data year[71]
– indicates data are not available

Source	Unit	Emission factor ($kgCO_2e$/unit) (TTW)							
		2017	2018	2019	2020	2021	2022	2023	2024
Petrol (E10) (NL)*	Liter	2.233	2.233	2.233	2.141	2.141	2.141	2.176	2.176
Diesel (B7) (NL)*	Liter	2.514	2.514	2.514	2.474	2.474	2.474	2.468	2.468
LPG (NL)	Liter	1.61	1.61	1.61	1.61	1.631	1.631	1.635	1.635
Bio-diesel (HVO)^	Liter	-	-	-	-	-	0.038	0.032	0.032
Bio-diesel (FAME)	Liter	-	-	-	-	0.035	0.035	0.031	0.031
CNG	Liter	2.234	2.234	2.234	2.234	2.284	2.284	2.255	2.255
Bio-CNG^	Liter	-	-	-	-	-	0.137	0.112	0.112
Gas-to-liquid	Liter	-	-	-	-	2.471	2.471	2.465	2.465
Propane	Liter	-	-	-	-	1.53	1.53	1.53	1.53
Fuel oil**	Liter	3.185 (WTW)	3.185 (WTW)	3.185 (WTW)	3.185 (WTW)	3.185 (WTW)	3.185 (WTW)	2.468 (TTW)	2.468 (TTW)
Natural gas	Nm^3	1.791	1.791	1.791	1.785	1.785	1.788	1.782	1.779
Grey energy	kWh	0.464	0.572	0.572	0.476	0.476	0.454	0.396	0.448
Electricity from unknown sources (kWh)##	kWh	-	-	-	0.405	0.405	0.369	0.290	0.270
Electricity (Wind Power/Hydropower/Solar Energy/Biomass)	kWh	0	0	0	0	0	0	0	0
Car, unknown fuel & weight	Vehicle km	0.181	0.181	0.181	0.163	0.163	0.145	0.145	0.145
Car, Petrol & weight class middle	Vehicle km	-	-	-	-	-	-	-	0.157
Car, Diesel & weight class middle	Vehicle km	-	-	-	-	-	-	-	0.136
Car, LPG & weight class middle	Vehicle km	-	-	-	-	-	-	-	0.138
Car, electric	Vehicle km	0	0	0	0	0	0	0	0
Car, petrol hybrid	Vehicle km	-	-	-	-	-	-	-	0.111
Minibus, petrol	Vehicle km	-	-	-	-	-	-	-	0.218

[71] Emission factors are sourced from here. Data for different years can be found here.

Source	Unit	Emission factor ($kgCO_2e$/unit) (TTW)							
		2017	2018	2019	2020	2021	2022	2023	2024
Public transport in general (traveled kms; type of transport unknown)	Traveler km	0.025	0.025	0.025	0.025	0.011	0.011	0.016	0.016
Public transport in general (traveled kms; Bus, Tram, Metro average)^^	Traveler km	-	-	-	-	0.052	0.052	0.059	0.059
Public transport by train (traveled kms; unknown train type)	Traveler km	0.005	0.005	0.005	0.005	0.002	0.002	0.002	0.002
Public transport by bus (traveled kms; type unknown)***	Traveler km	0.113	0.113	0.113	0.113	0.081	0.081	0.086	0.086
Public transport by tram (traveled kms)	Traveler km	0	0	0	0	0	0	0	0
Public transport by metro (traveled kms)	Traveler km	0	0	0	0	0	0	0	0
Air travel <700 km	Traveler km	0.278	0.278	0.278	0.278	0.278	0.202	0.202	0.202
Air travel 700-2500 km	Traveler km	0.187	0.187	0.187	0.187	0.187	0.152	0.152	0.152
Air travel >2500 km	Traveler km	0.137	0.137	0.137	0.137	0.137	0.140	0.140	0.140
Air travel, average km	Traveler km	-	-	-	-	-	0.160	0.160	0.160
Motor	Traveler km	-	-	-	-	-	-	0,113	0,113
Moped	Traveler km	-	-	-	-	-	-	-	0,064
Bicycle	Traveler km	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bulk goods, Truck, unit with semi-trailer heavy	Tonne km	0.064	0.064	0.064	0.064	0.067	0.067	0.067	0.067
Average heating networks*#	GJ	-	-	-	-	-	23.4	21.93	21.61
Methane*^	Kg	-	-	-	-	28 (WTW)	28 (WTW)	28 (WTW)	28 (WTW)
Nitrous oxide	Kg	-	-	-	-	265 (WTW)	265 (WTW)	265 (WTW)	265 (WTW)
Pellets from (dry) industrial waste stream (NL)/Pellets from fresh wood (NL)	Kg dry matter	-	-	0.006	0.006	0.006	0.006	0.006	0.006
Refrigerant R407c	Kg	-	-	-	-	-	-	-	1,624 (WTW)
Refrigerant R404a	Kg	-	-	-	-	-	-	-	3,943 (WTW)

Source	Unit	Emission factor ($kgCO_2e$/unit) (TTW)							
		2017	2018	2019	2020	2021	2022	2023	2024
Refrigerant R507	Kg	-	-	-	-	-	-	-	3,985 (WTW)
Refrigerant R410a	Kg	-	-	-	-	-	-	-	1,924 (WTW)
Refrigerant R449A	Kg	-	-	-	-	-	-	-	1,282 (WTW)
Refrigerant R448A	Kg	-	-	-	-	-	-	-	1,273 (WTW)
Refrigerant R744	Kg	-	-	-	-	-	-	-	1 (WTW)
Refrigerant R134A	Kg	-	-	-	-	-	-	-	1,300 (WTW)
Refrigerant R32	Kg	-	-	-	-	-	-	-	677 (WTW)
Sulphur hexafluoride	Kg	-	-	-	-	-	-	-	23,500 (WTW)

* There are different types of petrol and diesel in the list from CO2emissiefactoren.nl. It is advised by CO2emissiefactoren.nl to use these values (see CO2emissiefactoren.nl 2023, comments at Benzine).

^ Values before 2021 were indicative. Advised by CO2emissiefactoren.nl to use values of the year 2022 for previous years.

** Use of emission factors according to data year. For 2023, CO2emissiefactoren.nl recommends using the emission factor for diesel instead of the emission factor for fuel oil.

Advised by CO2emissiefactoren.nl to use values of the year 2020 and 2021 for previous years.

^^ Use of emission factors according to data year. For 2018 the emission factors of 2021 and 2022 have been used.

*** Use of emission factors according to data year. CO2emissiefactoren.nl reports that for the years 2021 and 2022 TTW is not available. TTW for 2021 and 2022 have been calculated based on that TTW is 78.9% of WTW.

*# The value for 2022 and 2023 is the average factor for heat from large heating networks. In current report, the 2022 emission factor has been used for all years before 2022 due to large differences between the 2022 emission factor and previous years. From 2023 onwards, for some social housing associations the emission factor of specific district heating networks has been used. The emission factors can be found in Appendix B.

*^ since 2021, the value for methane has been published by CO2emissiefactoren.nl. This value is also applicable for earlier years.

Appendix B: Emission factors heat networks

The specific emission factors for the large and medium heat networks for 2022 (used for 2023) and 2023 (used for 2024)

Supplier	Heat network	GHG emissions ($kgCO_2e/GJ^{th}$)	
		2022	2023
Eneco	Utrecht - Nieuwegein	21.43	26.0
Ennatuurlijk	Enschede	8.54	5.6
Ennatuurlijk	Eindhoven Strijp	35.8	21.93
Ennatuurlijk	Midden- en West-Brabant	15.55	32.8
Ennatuurlijk	Helmond	87.02	106.1
HVC	Dordrecht	11.52	9.6
HVC	Regio Alkmaar	9.23	9.7
Eneco	Rotterdam	23.4	37.4
Vattenfall	Leiden	23.4	46.3
SVP	Purmerend	26.49	49.1
Vattenfall	Almere	23.49	20.5
Vattenfall	Duiven/Westervoort	12.07	12.4
Vattenfall	Arnhem	13.06	21.93
Vattenfall	Lelystad	21.24	8.4
Vattenfall	Nijmegen Waalsprong	14.04	19.6