Research accountability for the impact measurement of the BNG Bank loan portfolio

Reporting year 2023

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Het PON & Telos
Sanne Paenen, MSc
Inge van Roovert, PhD
Senna Hansen, MSc
Daphne van de Ven, MSc
Fenna Bijster, MSc

Republiq
Mr. drs. Sander de Clerck
Leoniek Driessens, MSc

Colophon

Commissioned by

BNG BANK

Author(s)

Sanne Paenen, MSc
Inge van Roovert, PhD
Senna Hansen, MSc
Daphne van de Ven, MSc
Fenna Bijster, MSc

In cooperation with:

REPUBLIQ
Mr. drs. Sander de Clerck,
Leoniek Driessens, MSc,

Projectleader:

Sanne Paenen
+31 6 30 69 89 39
s.paenen@hetpon-telos.nl

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Tilburg University

het pon | telos
Official Partner
Tilburg University

More information

http://www.hetpon-telos.nl

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1 Introduction

1.1 Reading guide

BNG Bank expressed an ambition in 2020 to make 10% more social impact in 2023 compared to 2021. In order to determine whether BNG Bank is on track to achieve this ambition, it is important to properly define and measure impact.

The present report describes the methodology and the reliability of the data used for the sustainable development impact measurement of the BNG Bank loan portfolio. It is based on the BNG method report.[1]

This report contains the results of the third measurement. The results for reporting year 2021, 2022 and 2023 will be compared to determine if any impact is made during these years.

Paragraph 1.2 describes the construction of the concept 'impact', the calculation steps for measuring impact and the limitations of the method and the calculations. A management summary of the final results of the impact measurements is given in chapter 2. This chapter describes the absolute and relative development of the indicators and the impact attributable to the BNG bank. Quantitative data analysis was used for this study. The method of data collection, data processing, sources, years, and all calculation steps are described in the chapters 3 through 6 as well as the exact method description per sector. These chapters provide a description of the indicators used to calculate the impact per sector: municipalities with 16 indicators; social housing associations with 7 indicators; educational institutions with 4 indicators; and healthcare institutions with 3 indicators.

For a theoretical framework we refer to the report 'The Method to measure impact BNG Bank'.[2] This report explains why the following five Sustainable Development Goals (SDGs) are prioritized by the BNG: good health and well-being (SDG 3), quality education (SDG 4), affordable and clean energy (SDG 7), sustainable cities and communities (SDG 11), and climate action (SDG 13). The selected indicators per SDG are described including the criteria to select these indicators.

[1] Report can be found: https://www.bngbank.nl/over-BNG-Bank/Samen-maken-we-meer-impact
[2] Ibid.

1.2 Measuring impact

Research population

The loan portfolio of the BNG Bank consists of several different sectors. This report includes four sectors:

- Municipalities;
- Social housing associations;
- Healthcare institutions;
- Educational institutions.

The size of the sector in the loan portfolio of the BNG Bank is reflected in a weighted methodology. A detailed explanation of this weighing method is described in the method report[3].

Calculation steps for measuring impact

Reporting year 2023 (2-measurement) is outlined in this report, the benchmark are the results or scores of reporting year 2021; the 0-measurement. The impact is measured between the 0 and 2-measurement[4].

The impact calculation consists of four subsequent steps:

Step 1:
In the first step, for each indicator, a percentage change is calculated for all the individual clients per sector of the BNG Banks loan portfolio using the following formula:

((2-measurement score – 0-measurement score) / 0-measurement score) * 100

Exceptions to this are indicators measured in percentages, for these indicators the change between measurement 0 and 2 is calculated in percent points instead of percentage change. This is due to the chance of extreme values when applying the percentage change measurement method.

Step 2:
The method report[5] explains that the impact of each client depends on the proportion of the loan of this client relative to the total outstanding loans per sector. A client with a larger loan weighs more. Therefore, in the second step a weighted difference between the 0-measurement and 2-measurement is calculated for every client and every indicator, taking its share of the loan relative to total loan portfolio of that sector into account. The percentage of the outstanding loan per client is calculated as follows:

(loan of the client / sum of outstanding loans in that sector) * 100

[3] Ibid.
[4] The impact between year 2021-2022 and between 2022-2023 are not included in this report but can be requested at the BNG bank.
[5] Ibid.

Next, this percentage is used – in combination with the unweighted difference from step 1 – to calculate the weighted differences between the 0-measurement and the 2-measurement:

percentage of outstanding loan * percentage change between the 0-measurement and 2-measurement

Step 3:
The third step is to calculate the total impact per indicator. This is the sum of all the individual weighted differences per client between the 0-measurement and the 2-measurement.

For each selected indicator, the impact at the sector level is represented in a single score. This score is being calculated by one of the following two methods:

1. Total sum is calculated by adding the scores of the different clients within the loan portfolio.
2. Total average is calculated by taking the arithmetic mean over the scores of the clients within the loan portfolio.

In the calculation sheets[6] an overview is given of the method which is used for calculating the total score per indicator.

Because the four mentioned sectors have different outstanding loan volumes at the BNG Bank, a percentage per sector is given to weight the impact per indicator. The exact calculation method can be found in the method report (Ibid).

Step 4:
Finally, the impact per sustainable development goal is calculated using the weighted impact per indicator allocated to the specific SDG. The impact per indicator can be a positive or negative result.

[6] The calculation sheets provide an overview of all raw and processed data. The files are in possession of the BNG-bank.

Limitations in the calculation

There are some calculation aspects which require further explanation (e.g., missing values or the value of zero in one or both measurements, no new data available or changes in the loan portfolio of the BNG Bank). In this section we explain the implications for this study.

First, some indicators have missing values in one or both measurement years. As a result, clients do not have an impact score on these indicators. The missing values are counted and reported in the calculation sheets.

Second, some clients have a score of zero in the 0-measurement and a score that is not zero in the 2-measurement. In these cases, the percentage change formula does not work, because a division by zero is not possible. This results in zero impact, while there is definitely impact. These cases got an impact score of 100 percent. This percentage is used in step 2 of the calculation steps.[7] When an indicator is made up of percentages, a development in percentage points rather than a percentage increase or decrease has been calculated, both for individual clients and for the total impact score presented in chapter 2.

Finally, there are some changes in clients of the BNG Bank between reporting year 2021 and 2023. These associations and institutions are not included in the calculations, because they only have a valid score during the 0-measurement or during the 2-measurement and the impact cannot be allocated to the BNG Bank, as the bank's loan did not contribute to the changes.

[7] In the calculation sheets, these adjustments are visible with color.

2 Management summary impact results

Table 2 shows an overview of al the indicators used for the 0- and 2-measurement classified to the SDG to which the indicator belongs.

Table 2 Sustainable development goals and corresponding indicators

Sector	SDG	Name	0-measurement	2-measurement	Unit
Municipality	3.9	Nitrogen oxides (NO_x) emissions	2019	2021	kg
	3.9	Fine Particle ($PM_{2.5}$) emissions	2019	2021	kg
	3.9	Fine Particle (PM_{10}) emissions	2019	2021	kg
	3.9	Non-methane volatile organic compounds (NMVOS) emissions	2019	2021	kg
	7.2	Total renewable energy	2019	2021	TJ
	7.2	Total renewable electricity	2019	2021	TJ
	7.2	Total renewable heat	2019	2021	TJ
	7.2	Capacity of solar panels per inhabitant	2020	2022	Wp
	3.9	Average distance to hospital	2020	2022	kilometer
	11.1	Total amount of housing stock	2020	2022	# residences
	11.2	Number of inhabitants with access to public transportation	2021	2023	# persons
	11.6	Percentage zero-emission buses	2020	2022	% buses
	11.6	Total percentage of sorted household waste	2020	2022	%
	11.6	Total amount of residual household waste	2020	2022	kg
	13.3	Green roofs	2021	2023	%
	13.3	Flood risks	2020	2022	Inhabitants per ha
	13.2	GHG emissions per municipality	2020	2022	CO_2-eq
Educational institution	4a	Investments in school buildings and grounds	2020	2022	Euro
	13.2	GHG emissions per educational institution	2020	2022	CO_2-eq
	7.3	Energy consumption educational buildings – electricity	2020	2022	kWh
	7.3	Energy consumption educational buildings – natural gas	2020	2022	m^3
Social housing association	7.3	Energy consumption per social housing association – electricity	2020	2022	kWh
	7.3	Energy consumption per social housing association – natural gas	2020	2022	m^3
	11.1	Development costs - livability, maintenance, and improvements	2019	2021	Euro
	11.1	Amount of housing stock social houses per social housing association	2019	2021	# residences
	11.1	Financial accessibility social housings	2020	2022	dwellings
	7.3	Energy performance social housing	2021	2022	kWh/m^2
	13.2	GHG emissions per social housing association	2020	2022	CO_2-eq
Healthcare institution	7.3	Energy consumption for healthcare institutions – electricity	2020	2021	kWh
	7.3	Energy consumption for healthcare institutions – natural gas	2020	2021	m^3
	13.2	GHG emissions per healthcare institution	2020	2022	CO_2-eq

2.1.1 SDG 3 Good health and well-being

SDG target 3.9: by 2030 substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination.

Good air quality is important for healthy citizens and sustainable cities. People emit substances in industry, agriculture or mobility, aviation, but also, for example, when driving a car or cleaning. All these substances end up in our living area. Some substances are more harmful than others. That is why it is important to monitor all emissions for our own health, for the climate and the quality of the environment[8]. To take precautions, information is needed where these substances are emitted. Therefore, each year the Dutch Emission Inventory records emissions of over 375 substances both in quantity and location of emission.

In 2021, according to the Emissions Registration, traffic (including road, rail, and shipping traffic) accounted for 29% of particulate matter PM_{10} emissions. Mainly from exhaust fumes and, for example, tire wear. Agriculture (29%, mainly from barns), other industry (19%, e.g. from combustion processes), and consumers (20%, e.g. from wood burning) are also important emission sources. For particulate matter $PM_{2.5}$, traffic is also the largest emission source (36%), followed by consumers (33%), and other industry (17%).[9] Nitrogen oxides are mainly emitted by road and other traffic (about 70%) and agriculture (about 12%). The (other) industry and energy sectors both emit about 4%.

The results in table 2.1 show the absolute measurements of all the municipalities who are clients of the BNG Bank on 31 December 2022. The absolute kg emissions of $PM_{2.5}$, PM_{10} and NO_x dropped by about 10% while the emissions of NMVOS are increased by 17%. NMVOCs are mainly released from the use of paints, solvents, and cosmetics. The sharp increase in 2020 NMVOS emissions is due to the increased use of hand gel during the Covid-19 pandemic. At last, the distance to Dutch hospitals did not change.

Table 2.1 Sustainable development goal 3 and corresponding indicators

SDG	KPI	Results absolute 0-measurement	Results absolute 2-measurement	Results percentage	Results Loan portfolio BNG-Bank
3	Air pollution: emissions of $PM_{2.5}$	15,820,867 kg	13,943,045 kg	-11.87%	-0.30%
	Air pollution: emissions of PM_{10}	28,214,628 kg	25,015,189 kg	-11.34%	-0.30%
	Air pollution: emissions of NO_x	240,753,766 kg	218,376,298 kg	-9.29%	-0.24%
	Air pollution: emissions NMVOS	229,979,599 kg	269,938,944 kg	17.38%	0.47%
	Distance to hospital	6.6 km	6.6 km	1.4%	0.09%

[8] https://www.emissieregistratie.nl/over-emissieregistratie
[9] https://www.rivm.nl/lucht/luchtkwaliteit-Nederland

2.1.2 SDG 4 Quality education

SDG target 4a: Building and improving educational facilities.

For both municipalities and the educational institutions financed by BNG Bank, improving and remodeling educational buildings is a challenging mission. The Netherlands has seen a huge underinvestment in educational housing after the financial crisis of 2009.[10] After the covid-19 pandemic, renewed attention has been given to investments in buildings and grounds of educational institutions. For example, a customized ventilation system in schools was launched whereby schools can apply for funds to improve the indoor climate.

Table 2.2 shows that investment in buildings and grounds of educational institutions has increased by 74% in recent years. This increase is mainly caused by new policies to improve both the indoor and outdoor (environmental) climate of schools. The total impact attributable to the BNG Bank-investments is positive.

Table 2.2 Sustainable development goal 4 and corresponding indicator

SDG	KPI	Results absolute 0-measurement	Results absolute 2-measurement	Results percentage	Results Loan portfolio BNG-Bank
3	Investments in school buildings and grounds	€127,281,649	€221,641,253	74%	0.22%

2.1.3 SDG 7 Affordable and clean energy

SDG target 7.2: increase of substantially the share of renewable energy in the global energy mix by 2030.
SDG target 7.3: By 2030, double the global rate of improvement in energy efficiency.

These SDG targets are relevant to all client groups of BNG Bank and in particular to housing associations, healthcare and educational institutions. The current energy supply in the Netherlands is still largely based on burning fossil fuels. In total energy consumption, there is a trend reversal from gray to green energy.

Housing associations have been given an important role in the implementation of the Dutch Climate Agreement (Klimaat akoord)[11]: the major challenge is to make the housing stock more sustainable, transferring to gas-free houses and motivating residents to consume less energy.

In the Covenant on Energy Conservation in the Rental Sector of June 28, 2012, it was agreed that the social housing sector would try to make rental homes more sustainable to achieve

[10] https://www.bngbank.nl/over-BNG-Bank/Samen-maken-we-meer-impact - methodologie impact meten BNG Bank
[11] https://www.klimaatakkoord.nl/gebouwde-omgeving/in-het-kort

an average energy label B in 2020. Also included in the Climate Agreement is the ambition to make social real estate low in CO_2 by 2050.

Table 2.3 shows a decrease in the electricity consumption of both educational institutions, healthcare institutions, and housing associations that are clients of BNG Bank. On the other hand, the gas consumption of educational institutions has increased. This could be due to the reduced gas consumption during the closure of educational institutions during the corona pandemic in the years 2020 and 2021. In addition, Table 2.3 also shows a decrease in the gas consumption of healthcare institutions and housing association houses.

The percentage of sustainably generated energy has increased substantially in recent years. This is mainly reflected in renewably generated electricity.

Renewable electricity consumption increased by 28% in 2021 and accounted for about 33% of total electricity consumption[12] (this is not measured as indicator but background information). This increase is probably largely driven by an increase in solar and wind power generation capacity. Wind is the largest contributor to renewable electricity production (47%), followed by solar power (28 %) and biomass (25 %).[13] Of the installed solar panels, 20% are in solar parks and 80% are on the roof or as shading over parking lots[14].

Lastly, the table below shows that the energy performance of social housing association houses has decreased: on average less energy is consumed per square meter of floor space. This is mainly due to the improving insulation measures corporations have taken in recent years and the installation of solar panels.

Table 2.3 Sustainable development goal 7 and corresponding indicators

SDG	KPI	Results absolute 0-measurement	Results absolute 2-measurement	Results percentage	Results Loan portfolio BNG-Bank
7	Electricity use educational institutions	160,569,165 kWh	137,279,302 kWh	-14.50%	-0.03%
	Gas use educational institutions	52,574,532 m^3	56,729,041 m^3	7.90%	-0.006%[15]

[12] https://www.clo.nl/indicatoren/nl0385-verbruik-van-hernieuwbare-energie?ond=20881
[13] https://www.clo.nl/indicatoren/nl0385-verbruik-van-hernieuwbare-energie?ond=20881
[14] https://www.cbs.nl/nl-nl/nieuws/2023/22/aandeel-hernieuwbare-energie-in-2022-toegenomen-naar-15-procent
[15] Relative differences may be negative and impact results positive (or vice versa). This is mainly due to the measurement method used for the impact result. Here, a client with a larger loan portion counts more heavily than a client with a small loan portion. When the biggest changes occur for example with the largest clients, it is possible that the result of the total client group (sector) goes in the other direction than the impact result of the loan portfolio of the bank.

	Electricity use healthcare institutions	1,316,917,270 kWh	1,264,626,718 kWh	-3.97%	-0.12%
	Gas use healthcare institutions	594,248,811 m^3	529,137,375 m^3	-10.96%	-0.15%
	Electricity use social housing	4,491,609,699 kWh	4,377,271,268 kWh	-2.55%	-0.17%
	Gas use social housing	1,813,666,999 m^3	1,695,040,993 m^3	-6.54%	-0.46%
	Renewable energy municipalities	124,319 TJ	164,821 TJ	22.71%	0.49%
	Renewable electricity municipalities	14,508,888,889 kWh	22,731,666,667 kWh	56.67%	1.56%
	Renewable heat municipalities	54,407 TJ	55,576 TJ	2.15%	0.17%
	Solar panel capacity per capita	262,714 wp/inwoner	443,417 wp/inwoner	68.78%	1.26%
	Energy performance social housing	201.26 kWh/m^2	195.61 kWh/m^2	-5.63%	-0.19%

2.1.4 SDG 11 Sustainable cities and communities

SDG 11.1: by 2030, ensure access for all to adequate, safe and affordable housing, basic services, and upgrade slums.

In the Netherlands, there are not enough houses for everyone. Buying a house is too expensive for many people, for example for starters, households with a low or middle income and singles. Especially in the “Randstad” housing costs are high.[16]

An increase in the number of people in their 30s seeking to enter the owner-occupied market and the fact that the elderly are going to nursing homes less frequent and later has made the supply-demand ratio in the owner-occupied market tighter. In addition, population and household growth more often consists of immigrants who need housing acutely and cannot postpone the need for their own housing by, for example, living with parents for a longer period.

Growth in the number of condominium dwellings and the number of medium-sized dwellings has also lagged. The number of large, expensive homes has increased relatively strong, as has the number of private rental homes. These developments in supply, together with the introduction of the income limit for social housing association housing, may have contributed to making it more difficult for some groups in society to find housing.[17]

Other SDG sub targets in this chapter are *11.7: Provide access to safe and inclusive green and public spaces, 11.6: Reduce the environmental impact of cities, 11.2: affordable and sustainable transport systems.*

[16] https://www.dnb.nl/actuele-economische-vraagstukken/woningmarkt/
[17] https://www.cbs.nl/nl-nl/longread/de-nederlandse-economie/2022/achtergrond-bij-de-huizenprijsstijgingen-vanaf-2013?onepage=true

These SDG relates not only to housing (see outcome goal and SDG-target 11.1), but also to the environment in which people live. The SDG aims to make local living environments safe, affordable, accessible, and sustainable. There are many pressures on the living environment and available space[18]. An important topic is the reduction of waste and sustainable public transport, which is also relevant for municipalities, as they have a direct impact and given the policy goal of having all new buses run on 100% renewable energy or fuel by 2025.

Table 2.4 shows that among BNG Bank clients, the social housing stock decreased by 4 percent points and the number of affordable rental housing units (up to the capping limit) decreased by 12 percent points. On the other hand, the general housing stock increased.

Housing associations have also spent more money on housing improvements, maintenance, and livability costs in recent years. The table also shows that the number of emission-free buses has increased as well as the number of people with access to public transport (which is defined as living at a maximum distance of 700 meters from a public transport where a bus, tram, or metro stops at least 2x per hour).

Finally, the number of kilograms of residual waste has decreased and the waste separation rate has slightly increased.

Table 2.4 Sustainable development goal 11 and corresponding indicators

SDG	KPI	Results absolute 0-measurement	Results absolute 2-measurement	Results percentage	Results Loan portfolio BNG-Bank
11	Affordable housing	83.4%	71.5%	-11.92%	-0.69%
	Social housing stock	2,170,377	2,076,666	-4.32%	0.54%[19]
	Development costs - livability, maintenance, and improvements	€6,664,452,302	€7,621,290,379	14.36%	1.49%
	Housing stock in general	7,682,346	7,835,093	1.99%	0.04%
	Residents with access to public transport	10,984,709	12,141,893	10.53%	1.92%
	Zero emission busses	16.73%	25.79%	9.06%	0.16%

[18] https://www.bngbank.nl/over-BNG-Bank/Samen-maken-we-meer-impact - methodologie impact meten BNG Bank

[19] Relative differences may be negative and impact results positive (or vice versa). This is mainly due to the measurement method used for the impact result. Here, a client with a larger loan portion counts more heavily than a client with a small loan portion. When the biggest changes occur for example with the largest clients, it is possible that the result of the total client group (sector) goes in the other direction than the impact result of the loan portfolio of the bank.

	Percentage of sorted household waste	67.33%	67.91%	0.58%	0.00%
	Total amount of residual household waste	3,507,429,148 kg	3,185,201,932 kg	-9,19%	0.15%

2.1.5 SDG 13 Climate action

SDG target 13.2: Integrate climate change action into national policies, strategies, and planning.

Since the 2015 Paris Climate Conference, the banking sector has been involved in the realization of the ambitions of the Paris Agreement. Given the climate challenge and the crucial role of the banking industry, and the financial sector in general, in facilitating the net zero carbon transition, the Partnership for Carbon Accounting Financials (PCAF) was created.

PCAF is not only about measuring and disclosing the carbon footprint of a financial institutions' portfolio. It is also about setting targets, developing strategies, and acting to align this portfolio with the Paris Climate Agreement and by annually monitoring the progress of achieving the targets these institutions set[20].

For BNG Bank, climate action is a prominent issue, which is why for a few years now it has been reporting on the GHG emissions of the loan portfolio based on the PCAF methodology.

In Table 2.5 is shown that the GHG emissions of municipalities have increased while those of healthcare institutions and housing associations have decreased. The GHG emissions of municipalities have increased, due to an increase in GHG emissions within scope 3 of the GHG footprint (the municipality indirectly affects in its value chain). To calculate the GHG emissions of scope 3, the expenses of municipalities have been used. The GHG emissions of scope 3 probably increased because the expenses of the municipalities increased for 2022 in comparison to 2020[21].

In addition, the number of inhabitants (per ha) victimized by severe flooding has slightly decreased and the number of green roofs has slightly increased.

Table 2.5 Sustainable development goal 13 and corresponding indicators

SDG	KPI	Results absolute 0-measurement	Results absolute 2-measurement	Results percentage	Results Loan portfolio BNG-Bank
13	GHG emissions per municipality	6,010,567	6,822,002	13.50%	0.27%

[20] Greenhouse gas emissions of BNG Bank Loan portfolio
[21] Further information can be found in the PCAF report.

	GHG emissions per healthcare institution	1,879,734	1,650,091	-12.22%	-0.34%
	GHG emissions per social housing association	5,163,932	4,757,332	-7.87%	-0.54%
	GHG emissions per educational institution	161,449	154,237	-4.47	-0.024%
	Green roofs	0.98%	1.00%	0.02%	0.0012%
	Flood risk - Number of inhabitants affected per ha in flooding	0.61	0.59	-3.34%	0.25%

2.1.6 Total impact BNG loan portfolio

The ambition of the BNG Bank is to increase their impact on the SDGs by 10 percent between 2021 and 2023. Looking at the total impact results, calculated as the method described above and in the method report of BNG Bank. The BNG Bank has made a positive impact of 9.3 percent in 2 years. The largest impact is attributable to (sub)goal 7.2: increase in the number of households using renewable energy. In addition, the increase in sustainable public transport (subgoal 11.2) was also a major contributor. Besides positive impact, a negative impact of the BNG-Banks loan portfolio is also visible. The sub-goal 13.1: strengthen resilience and adaptive capacity shows a negative impact. It looks at the number of flood victims and the percentage of green roofs. In addition, a negative impact can be seen with regard to the objective of increasing affordable rental housing: the housing market in the Netherlands is in crisis and in recent years the number of affordable houses did not increase.

3 Municipalities

3.1 General factsheet

Topic	Description
Portfolio covered	99.3% of BNG Bank's portfolio is covered for this sector. This percentage is an indication of the completeness of the dataset. It is calculated by looking at the collected data for all indicators for the clients in the loan portfolio of the BNG Bank. The percentage is lower than 100% if there are missing data. The missing data are either not available, or it was not possible to collect or calculate these data correctly.
Indicators	- Average distance to hospital; - Nitrogen oxides (NO_x) emissions; - Fine Particle ($PM_{2.5}$) emissions; - Fine Particle (PM_{10}) emissions; - Non-methane volatile organic compounds (NMVOS) emissions; - Total renewable energy; - Total renewable electricity; - Total renewable heat; - Capacity of solar panels per inhabitant; - Total amount of housing stock; - Number of inhabitants with access to public transportation; - Percentage zero-emission buses; - Total amount of residual household waste; - Total percentage of sorted household waste; - Flood risk; - Green roofs; - GHG emissions per municipality.
Limitations	Some clients have a score of zero in the 0-measurement and for the 2-measurement a score that is higher than zero. In these cases, the formula (of percentage increase/decrease) does not work, because a division by zero is not possible. This results in zero impact, while there definitely is impact. These cases got a difference of 100 percent, and this percentage is used in step 2 of the 4 calculation steps.

3.2 Factsheets per indicator

3.2.1 Average distance to hospital

Topic	Description
Data	The average distance from all residents in an area to the nearest hospital (including clinics), calculated by road.
Calculation steps	No calculation steps.
Limitations	No limitations.
SDG	SDG 3.8
Data quality estimate	2 – Non-audited data, or other primary data

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Nabijheid voorzieningen; afstand, locatie, regionale cijfers
Data file	230920_Heringedeeld afstand ziekenhuis.xlsx
Data Source	Dutch Central Bureau of Statistics
Years	2020, 2021 & 2022
Last update	23-06-2022
Date of download	20-09-2023
Link to webpage	https://opendata.cbs.nl/statline/#/CBS/nl/dataset/80305ned/table?fromstatweb
Filters used to obtain the datafile	Onderwerp: Gezondheid en welzijn > Ziekenhuis (incl. buitenpolikliniek) > afstand tot ziekenhuis Regio's: Gemeenten per provincie Perioden: 2020, 2021 en 2022
Internal location	Klantgroepen\Gemeenten\Afstand ziekenhuis
Data quality estimate	2 – Non-audited data, or other primary data.
Unit of measurement	Not applicable
Selections	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\Afstand ziekenhuis\Printscreens

Topic	Description
Data	Regional division of municipalities 2020
Data file	Gemeentelijke indeling 2020.xlsx
Data Source	Dutch Central Bureau of Statistics
Years	2020
Last update	01-01-2020
Date of download	02-10-2023
Link to webpage	https://www.cbs.nl/nl-nl/onze-diensten/methoden/classificaties/overig/gemeentelijke-indelingen-per-jaar/indeling-per-jaar/gemeentelijke-indeling-op-1-januari-2020
Filters used to obtain the datafile	Not applicable

Internal location	Klantgroepen\Gemeenten\Basisbestanden
Data quality estimate	1 – Regional division of municipalities as stated by the Dutch government
Unit of measurement	Not applicable
Selections	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\Basisbestanden\Printscreens

Topic	Description
Data	Regional division of municipalities 2021
Data file	Gemeentelijke indeling 2021.xlsx
Data Source	Dutch Central Bureau of Statistics
Years	2021
Last update	01-01-2021
Date of download	02-10-2023
Link to webpage	https://www.cbs.nl/nl-nl/onze-diensten/methoden/classificaties/overig/gemeentelijke-indelingen-per-jaar/indeling-per-jaar/gemeentelijke-indeling-op-1-januari-2021
Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Gemeenten\Basisbestanden
Data quality estimate	1 – Regional division of municipalities as stated by the Dutch government
Unit of measurement	Not applicable
Selections	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\Basisbestanden\Printscreens

Topic	Description
Data	Regional division of municipalities 2022
Data file	Gemeentelijke indeling 2022.xlsx
Data Source	Dutch Central Bureau of Statistics
Years	2022
Last update	24-03-2022
Date of download	02-10-2023
Link to webpage	https://www.cbs.nl/nl-nl/onze-diensten/methoden/classificaties/overig/gemeentelijke-indelingen-per-jaar/indeling-per-jaar/gemeentelijke-indeling-op-1-januari-2022
Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Gemeenten\Basisbestanden
Data quality estimate	1 – Regional division of municipalities as stated by the Dutch government
Unit of measurement	Not applicable
Selections	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\Basisbestanden\Printscreens

3.2.2 Nitrogen oxides (NO_x) emissions

Topic	Description
Data	Emission to air of nitrogen oxides (NO_x) including nitrogen dioxide in kg.

	Data on nitrogen oxide emissions per municipality obtained from RIVM: http://www.emissieregistratie.nl
Calculation steps	Step 1: Source-data Source data has been collected for the years 2019 (0-measurement), 2020 (1-measurement), and 2021 (2-measurement). Calculation steps on the original dataset with emission-data have not been performed. The original dataset 346 regions, i.e. 344 municipalities (2023) and one region (region code 9999, Noordzee) that does not match any municipality. This last region will be neglected in the results.
Limitations	The most recent emission data available is of 2021. Emission data from region Noordzee is excluded from this calculation as it cannot be assigned to specific municipalities. The total of the emissions in the calculated dataset is therefore an underestimation of the total emission of the Netherlands. Emission data in the Netherlands is measured in kilograms per municipality. The international standard unit is µg/m^3. The data has not been recalculated to the international standard.
SDG	SDG 3.9
Data quality estimate	3 – Average data that is peer/(sub)sector-specific.

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Emission of NO_x in kg per municipality
Data file	Emissies_totaal.csv
Data Source	RIVM (www.emissieregistratie.nl)
Years	2019, 2020 & 2021
Last update	23-08-2023
Date of download	02-10-2023
Link to webpage	https://data.emissieregistratie.nl/export
Filters used to obtain the datafile	Stof: Fijnstof (PM_{10}), Fijnstof ($PM_{2.5}$), NMVOS, Stikstofoxiden (als NO_x) Jaar: 2019, 2020, 2021 Per locatie; gebiedsindeling: Gemeenten
Internal location	Klantgroepen\Gemeenten\SDG_3.9_Emissies lucht (NOx, PM2.5, PM10, NMVOS)\Berekening 1-meting\stikstofoxiden
Data quality estimate	3 Data is collected by RIVM on basis of organization reports and calculations of emissions in processes. The uncertainty factor is relatively large, however, approximately 18% on the scale of the Netherlands and somewhat larger per municipality. For further information see: https://www.emissieregistratie.nl/over-emissieregistratie/kwaliteit-van-de-emissiecijfers
Unit of measurement	Kg
Selections	Decimal point (.)
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\SDG 3.9 - Emissies lucht (NOx, PM2,5, PM10, NMVOS)\Printscreen

3.2.3 Fine Particle ($PM_{2.5}$) emissions

Topic	Description
Data	Emission to air of fine particles smaller than 2.5 microns, $PM_{2.5}$, in kg. Data on fine particle emissions per municipality obtained from RIVM: http://www.emissieregistratie.nl
Calculation steps	Step 1: Source-data Source data has been collected for the years 2019 (0-measurement), 2020 (1-measurement), and 2021 (2-measurement). Calculation steps on the original dataset with emission-data have not been performed. The original dataset 345 regions, i.e. 344 municipalities (2023) and one region (region code 9999, Noordzee) that does not match any municipality. This last region will be neglected in the results.
Limitations	The most recent emission data available is of 2021. Emission data from region Noordzee is excluded from this calculation as it cannot be assigned to specific municipalities. The total of the emissions in the calculated dataset is therefore an underestimation of the total emission of the Netherlands. Emission data in the Netherlands is measured in kilograms per municipality. The international standard unit is $\mu g/m^3$. The data has not been recalculated to the international standard.
SDG	SDG 3.9
Data quality estimate	3 – Average data that is peer/(sub)sector-specific. Score | Quality requirement 1 | Audited data or actual primary data 2 | Non-audited data, or other primary data 3 | Average data that is peer/(sub)sector-specific 4 | Proxy data on the basis of region or country 5 | Estimated data with very limited support

Topic	Description
Data	Emission of fine particles ($PM_{2.5}$) in kg per municipality
Data file	Emissies_totaal.csv
Data Source	RIVM (www.emissieregistratie.nl)
Years	2019, 2020 & 2021
Last update	23-08-2023
Date of download	02-10-2023
Link to webpage	https://data.emissieregistratie.nl/export
Filters used to obtain the datafile	Stof: Fijnstof (PM_{10}), Fijnstof ($PM_{2.5}$), NMVOS, Stikstofoxiden (als NO_x) Jaar: 2019, 2020, 2021 Per locatie; gebiedsindeling: Gemeenten
Internal location	Klantgroepen\Gemeenten\SDG_3.9_Emissies lucht (NOx, PM2.5, PM10, NMVOS)\Berekening 1-meting\fijnstof 2.5.xlsx
Data quality estimate	3 Data is collected by RIVM on basis of organization reports and calculations of emissions in processes. The uncertainty factor is relatively large, however, approximately 42% on the scale of the Netherlands and somewhat larger per municipality. For further information see: https://www.emissieregistratie.nl/over-emissieregistratie/kwaliteit-van-de-emissiecijfers
Unit of measurement	Kg
Selections	Decimal point (.)
Data missing	Not applicable

Print Screens	Klantgroepen\Gemeenten\SDG 3.9 - Emissies lucht (NOx, PM2,5, PM10, NMVOS)\Printscreen

3.2.4 Fine Particle (PM10) emissions

Topic	Description
Data	Emission to air of fine particles smaller than 10 microns, PM_{10}, in kg. Data on fine particle emissions per municipality obtained from RIVM: http://www.emissieregistratie.nl
Calculation steps	Step 1: Source-data Source data has been collected for the years 2019 (0-measurement), 2020 (1-measurement), and 2021 (2-measurement). Calculation steps on the original dataset with emission-data have not been performed. The original dataset 345 regions, i.e. 344 municipalities (2023) and one region (region code 9999, Noordzee) that does not match any municipality. This last region will be neglected in the results.
Limitations	The most recent emission data available is of 2021. Emission data from region Noordzee is excluded from this calculation as it cannot be assigned to specific municipalities. The total of the emissions in the calculated dataset is therefore an underestimation of the total emission of the Netherlands. Emission data in the Netherlands is measured in kilograms per municipality. The international standard unit is $\mu g/m^3$. The data has not been recalculated to the international standard.
SDG	SDG 3.9
Data quality estimate	3 – Average data that is peer/(sub)sector-specific.

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Emission of fine particles (PM_{10}) in kg per municipality
Data file	Emissies_totaal.csv
Data Source	RIVM (www.emissieregistratie.nl)
Years	2019, 2020 & 2021
Last update	23-08-2023
Date of download	02-10-2023
Link to webpage	https://data.emissieregistratie.nl/export
Filters used to obtain the datafile	Stof: Fijnstof (PM_{10}), Fijnstof ($PM_{2.5}$), NMVOS, Stikstofoxiden (als NO_x) Jaar: 2019, 2020, 2021 Per locatie; gebiedsindeling: Gemeenten
Internal location	Klantgroepen\Gemeenten\SDG_3.9_Emissies lucht (NOx, PM2.5, PM10, NMVOS)\Berekening 1-meting\fijnstof PM10.xlsx
Data quality estimate	3

	Data is collected by RIVM on basis of organization reports and calculations of emissions in processes. The uncertainty factor is relatively large, however, approximately 29% on the scale of the Netherlands and somewhat larger per municipality. For further information see: https://www.emissieregistratie.nl/over-emissieregistratie/kwaliteit-van-de-emissiecijfers
Unit of measurement	Kg
Selections	Decimal point (.)
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\SDG 3.9 - Emissies lucht (NOx, PM2,5, PM10, NMVOS)\Printscreen

3.2.5 Non-methane volatile organic compounds (NMVOS) emissions

Topic	Description
Data	Emission to air of non-methane volatile organic compounds, NMVOS, in kg. Data on fine particle emissions per municipality obtained from RIVM: http://www.emissieregistratie.nl
Calculation steps	Step 1: Source-data Source data has been collected for the years 2019 (0-measurement) and 2021 (2-measurement). Calculation steps on the original dataset with emission-data have not been performed. The original dataset 345 regions, i.e. 344 municipalities (2023) and one region (region code 9999, Noordzee) that does not match any municipality. This last region will be neglected in the results.
Limitations	The most recent emission data available is of 2021. Emission data from region Noordzee is excluded from this calculation as it cannot be assigned to specific municipalities. The total of the emissions in the calculated dataset is therefore an underestimation of the total emission of the Netherlands. Emission data in the Netherlands is measured in kilograms per municipality. The international standard unit is µg/m^3. The data has not been recalculated to the international standard.
SDG	SDG 3.9
Data quality estimate	3 – Average data that is peer/(sub)sector-specific.

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Emission of NMVOS in kg per municipality
Data file	Emissies_totaal.csv
Data Source	RIVM (www.emissieregistratie.nl)
Years	2019, 2020 & 2021
Last update	23-08-2023
Date of download	02-10-2023
Link to webpage	https://data.emissieregistratie.nl/export
Filters used to obtain the datafile	Stof: Fijnstof (PM_{10}), Fijnstof ($PM_{2.5}$), NMVOS, Stikstofoxiden (als NO_x) Jaar: 2019, 2020, 2021 Per locatie; gebiedsindeling: Gemeenten

Internal location	Klantgroepen\Gemeenten\SDG_3.9_Emissies lucht (NOx, PM2.5, PM10, NMVOS)\Berekening 1-meting\NMVOS.xlsx
Data quality estimate	3 Data is collected by RIVM on basis of organization reports and calculations of emissions in processes. The uncertainty factor is relatively large, however, approximately 46% on the scale of the Netherlands and somewhat larger per municipality. For further information see: https://www.emissieregistratie.nl/over-emissieregistratie/kwaliteit-van-de-emissiecijfers
Unit of measurement	Kg
Selections	Decimal point (.)
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\SDG 3.9 - Emissies lucht (NOx, PM2,5, PM10, NMVOS)\Printscreen

3.2.6 Total renewable energy

Topic	Description
Data	Total renewable energy in TJ Data on renewable energy obtained from Klimaatmonitor: https://klimaatmonitor.databank.nl/jive
Calculation steps	No calculations For the determination of the amount of renewable energy that is generated per municipality with several techniques, the total amount of generated renewable energy per province or RES-region is being used, as published by CBS (ordered by Rijkswaterstaat). The amounts per municipality are not being published by CBS because of the traceability to individual installations. This is why the provincial or the regional amounts of renewable energy has been divided by the municipalities within a province or region on the basis of the installed capacity per municipality or a different relevant distribution code. The data on the provincial level apply to: • Wind onshore since 2002; • Geothermic since 2014; • Biomass boilers since 2014; • Biogas since 2014; • Bio-WKK since 2019 (total nationwide before then). Data and comments can be found in the file: \Klantgroepen\Gemeenten\SDG_7.2_Hernieuwbare energie\Ruwe data\Totaal bekende hernieuwbare energie - 2020 - Gemeenten.xlsx
Limitations	The most recent data on renewable energy that is available is of 2021.
SDG	SDG 7.2
Data quality estimate	2 – Non-audited data, or other primary data. Both klimaatmonitor as well as CBS data are highly reliable, but not audited and thereby score 2.

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Totaal bekende hernieuwbare energie (TJ) per gemeente in 2021
Data file	Totaal bekende hernieuwbare energie - 2019 2020 2021 - Gemeenten
Data Source	Klimaatmonitor
Years	2019, 2020 & 2021
Last update	11-04-2023
Date of download	10-08-2023
Link to webpage	https://klimaatmonitor.databank.nl/jive (Klimaatmonitor - Totaal bekende hernieuwbare energie (databank.nl))
Filters used to obtain the datafile	Onderwerp: Hernieuwbare energie – Totaal bekende hernieuwbare energie Niveau: Gemeente – alle gemeenten Jaar: 2019 2020 2021

Internal location	Klantgroepen\Gemeenten\SDG_7.2_Hernieuwbare energie\Ruwe data\Totaal bekende hernieuwbare energie – 2019 2020 2021.xlsx
Data quality estimate	2 Klimaatmonitor obtains information from different sources. In the case of renewable energy, most information is provided by CBS, however several other sources are used to supplement this data. For more information see https://klimaatmonitor.databank.nl/content/overzicht-bronnen-en-methoden
Unit of measurement	TJ
Selections	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\SDG_7.2_Hernieuwbare energie\Printscreens

3.2.7 Total renewable electricity

Topic	Description
Data	Total renewable electricity in kWh Data on renewable electricity obtained from Klimaatmonitor: https://klimaatmonitor.databank.nl/jive
Calculation steps	The total renewable electricity (in TJ) per municipality is multiplied by the conversion factor of TJ to kWh, which is 277.777.778 to calculate the total renewable energy in kWh. For the determination of the amount of renewable electricity that is generated per municipality with several techniques, the total amount of generated renewable electricity per province or RES-region is being used, as published by CBS (ordered by Rijkswaterstaat). The amounts per municipality are not being published by CBS because of the traceability to individual installations. This is why the provincial or the regional amount of energy is being divided by the municipalities within a province or region on the basis of the installed capacity per municipality or a different relevant distribution code. The data on the provincial level apply to: • Wind onshore since 2002; • Geothermic since 2014; • Biomass boilers since 2014; • Biogas since 2014; • Bio-WKK since 2019 (total nationwide before then). Data, calculation steps and comments can be found in the file: \Klantgroepen\Gemeenten\ SDG_7.2_Hernieuwbare energie\Ruwe data
Limitations	The most recent data on renewable energy that is available is of 2021.
SDG	SDG 7.2
Data quality estimate	2 – Non-audited data, or other primary data. Both klimaatmonitor as well as CBS data are highly reliable, but not audited and thereby score 2.

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Totaal bekende hernieuwbare elektriciteit (TJ) per gemeente in 2021
Data file	Totaal bekende hernieuwbare elektriciteit – 2019 2020 2021 - Gemeenten.xlsx
Data Source	Klimaatmonitor
Years	2019, 2020 & 2021
Last update	11-4-2023
Date of download	10-08-2023
Link to webpage	https://klimaatmonitor.databank.nl/jive (Klimaatmonitor - Totaal bekende hernieuwbare elektriciteit (databank.nl))
Filters used to obtain the datafile	Onderwerp: Hernieuwbare energie – Totaal bekende hernieuwbare elektriciteit Niveau: Gemeente – alle gemeenten Jaar: 2019 – 2020 - 2021
Internal location	Klantgroepen\Gemeenten\SDG_7.2_Hernieuwbare energie\Ruwe data\Totaal bekende hernieuwbare elektriciteit – 2019 2020 2021 – Gemeenten.xlsx
Data quality estimate	2 Klimaatmonitor obtains information from different sources. In the case of renewable electricity, most information is provided by CBS, however several other sources are used to supplement this data. For more information see https://klimaatmonitor.databank.nl/content/overzicht-bronnen-en-methoden
Unit of measurement	TJ
Selections	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\SDG_7.2_Hernieuwbare energie\Printsceens

3.2.8 Total renewable heat

Topic	Description
Data	Total renewable heat in TJ Data on renewable energy obtained from Klimaatmonitor: https://klimaatmonitor.databank.nl/jive
Calculation steps	No calculations. Data directly from Klimaatmonitor. For the determination of the amount of renewable heat that is generated per municipality with several techniques, the total amount of generated renewable heat per province or RES-region is being used, as published by CBS (ordered by Rijkswaterstaat). The amounts per municipality are not published by CBS because of the traceability to individual installations. This is why the provincial or the regional amount of energy is being divided by the municipalities within a province or region on the basis of the installed capacity per municipality or a different relevant distribution code. The data on the provincial level apply to: • Wind onshore since 2002; • Geothermic since 2014; • Biomass boilers since 2014; • Biogas since 2014; • Bio-WKK since 2019 (total nationwide before then). Data and comments can be found in the file: \Klantgroepen\Gemeenten\SDG_7.2_Hernieuwbare energie\Totaal bekende hernieuwbare warmte – 2019 2020 2021 – Gemeenten
Limitations	The most recent data on renewable heat that is available is of 2021
SDG	SDG 7.2

Data quality estimate	2 – Non-audited data, or other primary data. Both klimaatmonitor as well as CBS data are highly reliable, but not audited and thereby score 2. Score / Quality requirement 1 – Audited data or actual primary data 2 – Non-audited data, or other primary data 3 – Average data that is peer/(sub)sector-specific 4 – Proxy data on the basis of region or country 5 – Estimated data with very limited support

Topic	Description
Data	Total known renewable heat (TJ) per municipality in 2019 2020 and 2021
Data file	Totaal bekende hernieuwbare warmte – 2019 2020 2021 - Gemeenten.xlsx
Data Source	Klimaatmonitor
Years	2019, 2020 & 2021
Last update	11-4-2023
Date of download	29-09-2023
Link to webpage	https://klimaatmonitor.databank.nl/jive (Klimaatmonitor - Totaal bekende hernieuwbare warmte (databank.nl))
Filters used to obtain the datafile	Onderwerp: Hernieuwbare energie – Totaal bekende hernieuwbare warmte Niveau: Gemeente – alle gemeenten Jaar: 2019 2020 2021
Internal location	Klantgroepen\Gemeenten\SDG_7.2_Hernieuwbare energie\Ruwe data\ Totaal bekende hernieuwbare warmte - 2019 2020 2021 - Gemeenten.xlsx
Data quality estimate	2 Klimaatmonitor obtains information from different sources. In the case of renewable heat, most information is provided by CBS, however several other sources are used to supplement this data. For more information see https://klimaatmonitor.databank.nl/content/overzicht-bronnen-en-methoden
Unit of measurement	MJ
Selections	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\SDG_7.2_Hernieuwbare energie\Printscreens

3.2.9 Capacity of solar panels per inhabitant

Topic	Description
Data	Capacity of solar panels per inhabitant
Calculation steps	The unit of downloaded data is Watt peak (Wp) per inhabitant. CBS publishes the capacity of solar panels since 2016. The total capacity of solar panels for the Netherlands can deviate from the total of all Dutch municipalities. The reason is that not all systems can be assigned to a municipality due to missing or flawed location data. Klimaatmonitor calculates the capacity of solar panels per inhabitant using CBS data as follows: pV (capacity) / inhabitants * 1000 Data, calculation steps and comments can be found in the file: \Klantgroepen\Gemeenten\SDG_7.2 – hernieuwbare energie\Vermogen zonnepanelen per inwoner – 2020 2021 2022 - Gemeenten.xlsx
Limitations	The most recent data is of 2022
SDG	SDG 7.2

Data quality estimate	2 – Non-audited data, or other primary data. Both klimaatmonitor as well as CBS data are highly reliable, but not audited and thereby score 2. Score / Quality requirement 1 – Audited data or actual primary data 2 – Non-audited data, or other primary data 3 – Average data that is peer/(sub)sector-specific 4 – Proxy data on the basis of region or country 5 – Estimated data with very limited support

Topic	Description
Data	Capacity of solar panels per inhabitant in 2022
Data file	Vermogen zonnepanelen per inwoner – 2020 2021 2022 - Gemeenten.xlsx
Data Source	Klimaatmonitor
Years	2020, 2021 & 2022
Last update	19-08-2021
Date of download	31-08-2022
Link to webpage	https://klimaatmonitor.databank.nl/jive
Filters used to obtain the datafile	Onderwerp: Inhoudelijke datasets per sector en thema – hernieuwbare energie-installaties – Zonnepanelen – Aantallen installaties – Vermogen zonnepanelen per inwoner Niveau: Gemeente – alle gemeenten. N.B. For the calculation of total score: Nederland Jaar: 2020 2021 2022
Internal location	Klantgroepen\Gemeenten\SDG_7.2 Hernieuwbare energie
Data quality estimate	2 Klimaatmonitor obtains information from different sources. In the case of solar panels, most information is provided by CBS, however several other sources are used to supplement this data. For more information see https://klimaatmonitor.databank.nl/content/overzicht-bronnen-en-methoden
Unit of measurement	Watt peak (Wp)
Selections	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\SDG7.2 Hernieuwbare energie\Printscreens

3.2.10 Total amount of housing stock

Topic	Description
Data	Number of total rental units per year per social housing association. Data on new owner occupied units obtained from dVi woningcorporaties: https://data.overheid.nl/
Calculation steps	The data is obtained by performing the following steps: Download the number of independent rental units per year per housing association from Aedes Datacentrum. By downloading the dVi files. Chapter one of dVi contains the names and institution numbers of the housing associations. Chapter two contains the number of new realized units per year and the corresponding institution number. By joining both chapters on institution number the total number of units per housing association are obtained. The results of both steps are joined on name of housing association.

	Multiple housing associations have merged in the period 2016-2019. The values in this dataset are given for each housing association for each year. When an institution does not longer exist after a merge, the values are set at missing from the year of the merge. From that year onwards, the values of new units are added to the values of the institution that continues to exist or is established. The column 'corporatie'_huidig' contains the current name of each housing association.
Limitations	Not applicable
SDG	SDG 11.1 Sustainable cities and communities
Data quality estimate	2 - Non-audited data, or other primary data Score / Quality requirement 1 – Audited data or actual primary data 2 – Non-audited data, or other primary data 3 – Average data that is peer/(sub)sector-specific 4 – Proxy data on the basis of region or country 5 – Estimated data with very limited support
Topic	Description
Data	Share of new homes
Calculation steps	none
Limitations	Most recent data available is of 2022
SDG	SDG 11.1
Data quality estimate	2 - Primary data, not audited Score / Quality requirement 1 – Audited data or actual primary data 2 – Non-audited data, or other primary data 3 – Average data that is peer/(sub)sector-specific 4 – Proxy data on the basis of region or country 5 – Estimated data with very limited support

Topic	Description
Data	Number of total rental units per year per housing association
Data file	Berekende data.xlsx
Data Source	Aedes Datacentrum
Year	2016-2021
Last update	09-01-2023
Date of download	20-11-2023
Link to webpage	https://aedesdatacentrum.nl/jive/?Var=h_dvicbs1,h_dvicbs2,e_hucorp,e_huovv,tot_kp,e_huonb,p_e_hucorp,p_e_huovv,p_tot_kp,p_e_huonb&Mostrecentperiods=5&geolevel=nederland&geoitem=1&geocompare=
Filters used to obtain the datafile	Year: 2016, 2017, 2018, 2019, 2020, 2021 Subjects: Zelfstandige huurwoningen DAEB, Zelfstandige huurwoningen niet-DAEB, nieuwbouw woongelegenheden Level: woningcorporatie
Internal location	23178_Tweede_impact_meting_NWB_bank\5_Data-analyse\Klantgroepen\Woningcorporaties\SDG 11 Toe of afname woningvoorraad
Data quality estimate	1
Unit of measurement	Number of rental units

Selections	Not applicable
Data missing	Not applicable
Print Screens	23178_Tweede_impact_meting_NWB_bank\5_Data-analyse\Klantgroepen\Woningcorporaties\ SDG 11 Toe of afname woningvoorraad\Printscreens

3.2.11 Number of inhabitants with access to public transportation

Topic	Description
Data	Number of inhabitants that reside within 700 m of a bus, metro, tram or trainstation or stop that is serviced at least twice an hour. Data on public transportation obtained from gtfs OVapi: http://gtfs.ovapi.nl/ Data on inhabitants on a (hectare) grid obtained from CBS: https://www.cbs.nl/nl-nl/dossier/nederland-regionaal/geografische-data/kaart-van-100-meter-bij-100-meter-met-statistieken Data on municipality boundaries obtained from Nationaal Georegister: Nationaal georegister - bestuurlijke grenzen: gemeenten (https://www.nationaalgeoregister.nl/geonetwork/srv/dut/catalog.search#/metadata/e2ac0716-1fcc-4f7c-b704-d8c2ef8dffd6?tab=general)
Calculation steps	The calculation steps are performed in three ways, by 1) R-script, 2) in QGIS, 3) in Excel 1) R-script: Select only those stops or stations that are serviced at least twice an hour on weekdays between 7am and 8pm. These are regularly serviced stops. Data from GTFS concerning public transportation schedules are downloaded. An R-script is used to perform the following steps and calculations (N.B. for more precise description of the steps review the R-script "R script regularly serviced public transport stops"): From the data only tram, underground, train, and bus services are subtracted. In the schedules only the weekdays are taken into account of which 20 randomly selected days per weekday are selected as a subsample. Public transport schedules for these 100 days are loaded and only the times between 7am and 8pm are taken into consideration. Within this timeframe the script counts the number of times a means of public transport, i.e. a bus, tram, train, or underground, services a stop or station. This calculation is done for all stops and stations. The number of times a stop or station is serviced is divided by the number of days (100) and the number of hours per day (13) to calculate how often a stop is serviced per hour on weekdays. Only those stops or stations that are frequented at least twice an hour are taken into consideration. These stops are saved to file busmetrotramtreinhaltenMin2PerUur_2023_subsam100.csv 2) QGIS: Calculate the number of inhabitants that live within 700 meters of the regularly serviced stops. Those inhabitants have access to public transportation. Data from CBS (CBS vierkant) and geographical information of municipalities is combined with the regularly serviced stops from step 1 to calculate the number of inhabitants per municipality that live within 700 meters of regularly serviced public transport stops and the total inhabitants per municipality. Research indicates that 700 meters is approximately the maximum distance inhabitants travel by foot to a public transport stop, except for the larger stations or public transport hubs. The following steps were performed to calculate these data (N.B. for a more precise description of the steps review "QGIS public transportation script.docx"). Use the file created in step 1 to create a 700-meter buffer around regularly serviced Public Transport stops.

	Combine information on geographic location of municipalities with CBS vierkantstatistieken to create a 100m grid of points containing the municipality code and the number of inhabitants that live around that point. Select the points with municipality and inhabitant data that are located within the 700 meter bufferzone around the regularly serviced Public Transport stops. Calculate the number of inhabitants per municipality that live within 700 meters of a regularly serviced Public Transport stop. Save these to file (inhabitantsaccesstoPT_permunicipality2022.csv) 3) Excel: Clear out the whitelines in the .csv-file.
Limitations	The public transportation data regards schedules for the coming year (2023); it is thus not based on actual results of the past year. The distance inhabitants are willing to travel by bike or car to a public transport stop is not considered in this measurement.
SDG	SDG 11.2
Data quality estimate	2 – Non-audited data, or other primary data

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Public transportation information (o.a. routes, stops, stop_times, trips) of buses, trams, undergrounds, trains and ferries in the Netherlands.
Data file	In Folder: gtfs-openov-nl agency.txt calendar_dates.txt feed_info.txt routes.txt shapes.txt stop_times.txt stops.txt transfers.txt trips.txt
Data Source	GTFS OVapi
Years	2019, 2022 & 2023
Last update	31-08-2023 (frequently updated)
Date of download	01-09-2023
Link to webpage	http://gtfs.ovapi.nl/
Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Gemeenten\SDG_11.2_Toegang OV\Ruwe data
Data quality estimate	2 Data is provided by General Transit Feed Specification (gtfs.org), an organization that stimulates open data for public transportation organizations. The different Dutch organizations for public transport provide the data for the gtfs.ovapi.nl platform. This data is provided on the basis of best-effort, thus there is no service level agreement. See gtfs.ovapi.nl/README for more information.
Unit of measurement	Several units (date, time, location, number)

Selections	Not applicable
Data missing	Data of years 2020 and 2021 are not reliable and comparable due to adjusted rules for ov transport because of the covid 19 pandemic.
Print Screens	Klantgroepen\Gemeenten\SDG_11.2_Toegang OV\Printscreens

Topic	Description
Data	Data on inhabitants of the Netherlands on a 100 x 100m grid
Data file	cbs_vk100_2022_v1.gpkg
Data Source	Statistics Netherlands (CBS)
Year	2022
Last update	May 2023
Date of download	12-09-2023
Link to webpage	https://www.cbs.nl/nl-nl/dossier/nederland-regionaal/geografische-data/kaart-van-100-meter-bij-100-meter-met-statistieken
Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Gemeenten\SDG 11.2 – Toegang OV\Ruwe data
Data quality estimate	2
Unit of measurement	Number of inhabitants
Selections	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\SDG_11.2_Toegang OV\Printscreens

Topic	Description
Data	Data on geographic location of Dutch municipalities
Data file	Gemeentegrenzen_2023.gpkg
Data Source	PDOK / Nationaal Georegister / kadaster
Year	2023
Last update	24-01-2023
Date of download	02-10-2023
Link to webpage	https://service.pdok.nl/ kadaster/bestuurlijkegebieden/wfs/v1_0?request=GetCapabilities&service=WFS
Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Gemeenten\ SDG_11.2_Toegang OV \Berekening
Data quality estimate	2
Unit of measurement	Multipolygon
Selections	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\SDG_11.2_Toegang OV\Printscreens

3.2.12 Percentage zero-emission buses

Topic	Description
Data	The data is obtained from CROW: https://crow.databank.nl/jive?cat_open_code=cgdggibcigwZhegg&var=sb_rap
Calculation steps	To calculate the % of zero emission buses, the number of buses on hydrogen and electricity has been divided by the total amount of buses in a municipality (concession area)

Limitations	The municipality data is based on the data from the concession areas, meaning that municipalities belonging to a specific concession area have the same number of buses. This is a logical inference, as buses are not confined to specific municipalities, but drive around the concession area. Which municipalities belongs to which concession area is shown in the datafile.
SDG	SDG 11.6
Data quality estimate	2 – Non-audited data, or other primary data. Score | Quality requirement 1 | Audited data or actual primary data 2 | Non-audited data, or other primary data 3 | Average data that is peer/(sub)sector-specific 4 | Proxy data on the basis of region or country 5 | Estimated data with very limited support

Topic	Description
Data	Percentage zero emission buses
Data file	20230920_Bronbestand emissievrije bussen.xlsx
Data Source	CROW
Years	2020, 2021 & 2022
Last update	20-08-2022
Date of download	20-09-2023
Link to webpage	https://crow.databank.nl/viewer/?cat_open_code=cgdggibcigwZhegg&var=sb_rap
Filters used to obtain the datafile	Duurzaamheidsscore Mobiliteitscore Schone Bussen Aantallen Elektrisch Waterstof Totaal
Internal location	Klantgroepen\Gemeenten\SDG11.6 – emissievrije bussen
Data quality estimate	2 – Non-audited data, or other primary data.
Unit of measurement	% zero-emission buses
Selections	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\SDG11.6 - emissievrije bussen\Printscreens

3.2.13 Total amount of residual household waste

Topic	Description
Data	The data is obtained from CBS: https://opendata.cbs.nl/statline/#/CBS/nl/dataset/83452NED/table?ts=1638976050279
Calculation steps	To calculate the amount of residual household waste per municipality, the amount of residual household waste per inhabitant was multiplied by the number of inhabitants of the municipality. Missing data has been filled with data from previous data year, if available.

	Non-segregated household waste is waste that is collected by municipalities at households including waste of small stores and businesses that is collected at the same time and in the same way as that from households. Thus, a (small) part of the collected waste does not originate from households.
Limitations	Data is not final yet and may slightly change per year
SDG	SDG 11.6
Data quality estimate	2 - Non-audited data, or other primary data

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Amount of residual household waste
Data file	231026_Afval 2020-2021-2022.xlsx
Data Source	Statistics Netherlands (CBS)
Years	2020, 2021 & 2022
Last update	20-10-2023
Date of download	25-10-2023
Link to webpage	https://opendata.cbs.nl/ #/CBS/nl/dataset/83452NED/table?searchKeywords=gemeentelijk%20afval
Filters used to obtain the datafile	Afvalsoort: Gemengd huishoudelijk afval; Overig huishoudelijk afval Regio's: alle gemeenten Perioden: 2020 2021 2022 Onderwerp: Hoeveelheid huishoudelijk afval
Internal location	Klantgroepen\Gemeenten\SDG 11.6 - afval
Data quality estimate	2
Unit of measurement	Kg per inhabitant
Selections	Not applicable
Data missing	Missing data filled with data from previous data year, if available
Print Screens	Klantgroepen\Gemeenten\SDG 11.6 - Afval\Printscreens

Topic	Description
Data	Number of inhabitants per municipality 2020, 2021 & 2022
Data file	231026_Aantal inwoners 03759NED.xlsx
Data Source	Statistics Netherlands (CBS)
Year	2020, 2021 & 2022
Last update	26-05-2023
Date of download	26-10-2023
Link to webpage	https://opendata.cbs.nl/#/CBS/nl/dataset/03759ned/table?dl=39E0B
Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Gemeenten\SDG 11.6 – Afval\Bronbestanden
Data quality estimate	1 – Number of inhabitants per municipality as stated by the Dutch government
Unit of measurement	Not applicable
Selections	Not applicable
Data missing	Not applicable

Print Screens	Klantgroepen\Gemeenten\SDG 11.6 – Afval\Printscreens

Topic	Description
Data	Regional division of municipalities 2020, 2021 & 2022
Data file	Gemeentelijke indeling 2020.xlsx Gemeentelijke indeling 2021.xlsx Gemeentelijke indeling 2022.xlsx
Data Source	Statistics Netherlands (CBS)
Year	2020, 2021 & 2022
Last update	Not applicable
Date of download	30-10-2023
Link to webpage	https://www.cbs.nl/nl-nl/onze-diensten/methoden/classificaties/overig/gemeentelijke-indelingen-per-jaar
Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Gemeenten \Basisbestanden
Data quality estimate	1 – Regional division of municipalities as stated by the Dutch government
Unit of measurement	Not applicable
Selections	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten \Basisbestanden\Printscreens

3.2.14 Percentage of sorted household waste

Topic	Description
Data	The data is obtained from CBS: https://opendata.cbs.nl/statline/#/CBS/nl/dataset/83452NED/table?ts=1638976050279
Calculation steps	To calculate the percentage of sorted household waste, the following data is required: amount of residual waste and sorted household waste per inhabitant. Initially, these types of waste were multiplied by the municipality's population to obtain the quantity per municipality. Then, the sorted household waste and residual waste were summed to get the total waste. Finally, the sorted household waste was divided by the total waste to obtain the percentage of separated waste per municipality. Missing values have been filled in with data from the previous year if available. Sorted household waste is waste that is collected at households by municipalities including waste of small stores and businesses that is collected at the same time and in the same way as that from households. E.g. the amount of textile, used paper, and cardboard, which are collected by schools, associations and charities is often collected at the same time and in the same way as that from households. Thus, a (small) part of the collected waste does not originate from households.
Limitations	-
SDG	SDG 11.6
Data quality estimate	2 - Non-audited data, or other primary data

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country

	5	Estimated data with very limited support

Topic	Description
Data	Percentage of sorted household waste
Data file	231026_Afval 2020-2021-2022
Data Source	Statistics Netherlands (CBS)
Years	2020, 2021 & 2022
Last update	20-10-2023
Date of download	25-10-2023
Link to webpage	https://opendata.cbs.nl/ #/CBS/nl/dataset/83452NED/table?searchKeywords=gemeentelijk%20afval
Filters used to obtain the datafile	Afvalsoort: Gescheiden ingezameld fijn afval; Gescheiden ingezameld grof afval Regio's: alle gemeenten Perioden: 2020 2021 2022 Onderwerp: Hoeveelheid huishoudelijk afval
Internal location	Klantgroepen\Gemeenten\SDG 11.6 - Afval
Data quality estimate	2
Unit of measurement	Kg per inhabitant
Selections	Not applicable
Data missing	Missing values are filled in with data from the previous year if available.
Print Screens	Klantgroepen\Gemeenten\SDG 11.6 – Afval\Printscreens

Topic	Description
Data	Number of inhabitants per municipality 2020, 2021 & 2022
Data file	231026_Aantal inwoners 03759NED.xlsx
Data Source	Statistics Netherlands (CBS)
Year	2020, 2021 & 2022
Last update	26-05-2023
Date of download	26-10-2023
Link to webpage	https://opendata.cbs.nl/#/CBS/nl/dataset/03759ned/table?dl=39E0B
Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Gemeenten\SDG 11.6 – Afval\Bronbestanden
Data quality estimate	1 – Number of inhabitants per municipality as stated by the Dutch government
Unit of measurement	Not applicable
Selections	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\SDG 11.6 – Afval\Printscreens

Topic	Description
Data	Regional division of municipalities 2020, 2021 & 2022
Data file	Gemeentelijke indeling 2020.xlsx Gemeentelijke indeling 2021.xlsx Gemeentelijke indeling 2022.xlsx
Data Source	Statistics Netherlands (CBS)
Year	2020, 2021 & 2022
Last update	Not applicable
Date of download	30-10-2023

Link to webpage	https://www.cbs.nl/nl-nl/onze-diensten/methoden/classificaties/overig/gemeentelijke-indelingen-per-jaar
Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Gemeenten \Basisbestanden
Data quality estimate	1 – Regional division of municipalities as stated by the Dutch government
Unit of measurement	Not applicable
Selections	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten \Basisbestanden\Printscreens

3.2.15 Flood risk

Topic	Description
Data	Flood risk
Calculation steps	For this indicator, potential victims have been calculated for areas that have a medium flood risk, i.e. probability of 1 / 100 per year which is approximately once in a lifetime. To calculate the number of potential victims of such a flood event, the map with flood data has been combined with the number of inhabitants per hectare (CBS). The map with calculated flood risk does not change in time, however the number of inhabitants within that area does vary per year.
Limitations	No limitations
SDG	SDG 13.1
Data quality estimate	3 – Average data that is peer/(sub)sector-specific.

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Flood risk
Data file	Overstromingen 0-, 1-, 2-meting.xlsx
Data Source	Risicokaart.nl
Year	2020, 2021 & 2022
Last update	2022
Date of download	5-2022
Link to webpage	https://www.atlasleefomgeving.nl/kaarten
Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Gemeenten\SDG13.1 – Overstromingsrisico
Data quality estimate	3 – This data has been modeled on the basis of probability calculations combined with CBS inhabitants' data.
Unit of measurement	Number of victims per inhabitants (by flood with risk of medium probability)

Selections	Not applicable
Data missing	Not applicable
Print Screens	Not applicable

3.2.16 Green roofs

Topic	Description
Data	Green roofs
Calculation steps	Results have been aggregated and reclassified to the 2023 municipality classification. Calculation steps on the source data have been performed by Readar by means of automatic detection through machine learning. Manual checks have been performed by Readar. Calculation steps (for a more thorough explanation of the calculations see " Klantgroepen\Gemeenten\SDG_13.1_Groene daken\Ruwe data - overig\202311_Levering_Groene_daken.pdf"): Step 1: Flat roof surface of buildings larger than 50 m^2 have been calculated on the basis of LiDAR data (AHN3+AHN4). Step 2: By means of automatic detection, green roofs have been identified on the basis of aerial photos. Step 3: Manual checks have been performed to check whether automatic detection correctly recognized green roofs. Step 4: An additional calculation on the basis of vegetation index provided by the aerial photos has been performed to get correct green roof surface areas. Step 5: Calculated data has been assigned to municipalities on the basis of BAG building data and CBS Buurten en Wijken data. Data used by Readar for the calculations: a. 2016, 25cm RGB b. 2017, 25cm RGB c. 2018, 25cm RGB d. 2019, 25cm TrueOrtho RGB+N e. 2020, 25cm RGB+N f. 2021, 08cm TrueOrtho RGB g. 2022, 08cm RGB h. 2023, 08cm RGB i. 2023, 25cm TrueOrtho RGB+N 1. AHN4 hoogtedata waar beschikbaar 2. AHN3 hoogtedata waar AHN4 niet beschikbaar is 3. BAG pandinformatie 4. CBR buurten en wijken
Limitations	No limitations
SDG	SDG 13.1
Data quality estimate	2 – Non-audited data, or other primary data. Score Quality requirement

1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Green roofs
Data file	0- en 1-meting groene daken heringedeeld.csv
Data Source	Readar
Years	2020 & 2021
Last update	2021
Date of download	04-11-2022
Link to webpage	https://readar.com/
Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Gemeenten\ SDG_13.1_Groene daken
Data quality estimate	2 – data has been calculated on the basis of aerial photos and BAG information of Kadaster, AHN data and CBS 40uurtene n Wijken data. Calculations have an uncertainty factor.
Unit of measurement	Surface area percentage (surface area in m^2)
Selections	Not applicable
Data missing	Not applicable
Print Screens	Not applicable

3.2.17 GHG emissions per municipality

Topic	Description
Data	***Data to calculate scope 1 and 2 GHG emissions*** For scope 1 natural gas use and scope 2 electricity use, data of 2022 has been used. For scope 1 fossil use by company vehicles, the calculation has been made with partial use of 2021 data. The data used in this approach come from multiple sources. For scope 1 natural gas use and scope 2 electricity use, energy consumption data for buildings owned by municipalities has been used. Republiq provided Het PON & Telos with the energy consumption data. Republiq has used estimated values for different functions and building periods. Het PON & Telos have calculated the GHG emissions for scope 1 fossil fuel use by company cars, utilizing multiple data sources. Data regarding the number of employees working for SBI-code 8411 (general government administrations which includes municipalities, as well as provinces and ministries) and the data about the number of employees working for the total public administration and government services sector comes from Lisa. Lisa serves as the national information system for jobs in the Netherlands, housing a comprehensive database that encompasses information on all locations where paid work is conducted. The data is provided based on the 2022 municipality division. Consequently, all other utilized data has been reclassified to align with the 2022 municipality division, ensuring coverage of all municipalities present in Lisa's dataset.

	Data regarding the number of employees working for the provincial government organization comes from 'A&O fonds provincies'. 'A&O fonds provincies' is an organization that provides practical tools, knowledge, and subsidies for governments. This data is available on the aggregation level of provinces. Data about the number of cars owned by companies per sector comes from the Dutch Central Bureau of Statistics (CBS). The data originates from motor vehicle registration (RDW[33]), ensuring its reliability and accuracy. Data about the number of kilometers driven with a car per year comes from the Dutch Central Bureau of Statistics (CBS) and covers the average kilometers per year of a passenger car with a Dutch registration. The original data comes from the online kilometer registration (OKR) of the RDW ensuring its reliability.
Calculation steps	**Scope 1 natural gas and scope 2 electricity** The following steps have been performed by Republiq: 1. Inventory of buildings owned by municipalities 2. Joining consumption data 1. Inventory of buildings owned by municipalities Republiq has a dataset called 'dataset maatschappelijk vastgoed'. This dataset contains all buildings that are owned by municipalities and/or used for public functions, such as education, sports, wellbeing, and culture. Republiq has sorted out all the buildings owned by municipalities, removing those designated for residential, industrial, retail, or lodging purposes. 2. Joining consumption data For different years Republiq has estimated values available for energy consumption for different types of functions and building periods: for instance, the energy consumption for a sports center constructed in 1960. Republiq has joined these estimated values to the dataset from step 1 on the function and building 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 for the years 2020, 2021, and 2022. Republiq has delivered the following data to Het PON & Telos: - Total electricity consumption (in kWh) - Total gas consumption (in Nm^3) The following step has been performed by Het PON & Telos: In order to make the final calculations for both Scope 1 natural gas use and Scope 2 electricity use, the total electricity and natural gas use have been multiplied by the correct emission factor (from the same year as the data). For Scope 1 Natural gas use the emission factor Natural gas (Nm_3) has been used. For Scope 2 Electricity use the emission factor Electricity from unknown sources (kWh) has been used. The following emission factors have been used: - Electricity unknown source: 0.405 kg CO_2-eq /kWh (2020 and 2021) and 0.369 kg CO_2-eq /kWh (2022); - Natural gas: 1.785 kg CO_2-eq /Nm^3 (2020 and 2021) and 1.788 kg CO_2-eq /Nm^3 (2022). **Scope 1 fossil fuel for company cars** Scope 1 emissions also include the fossil fuel emissions of company cars. To calculate these emissions, the number of employees that work for the total public administrations and government services sector as well as the number of employees that work for a general government administration (SBI-code 8411: general government administrations which includes municipalities, as well as provinces and ministries), both per municipality have been used.

<table>
<tr><td></td><td>The number of company cars used in the total public administration and government services sector is known (CBS Statline).

The total number of company cars for Dutch municipalities has been multiplied by the percentage of employees working for that municipality, relative to all employees working for Dutch municipalities to result in the number of company cars per municipalities. This has been multiplied by the number of kilometers driven per company car (all fuel types) and multiplied by the emission factor for passenger transport, car, fuel type unknown, weight class unknown. The GHG emissions have been divided by the factor 1000, to result in ton GHG emissions for company cars.

The following emission factor has been used:
- Passenger transport, car, fuel type unknown, weight class unknown: 0.163 kg CO_2 / Vehicle km (2020 and 2021) and 0.145 CO_2 / Vehicle km (2022).

The emission factors can be found in the folder: Klantgroepen, file: 20230717 emissiefactoren met bron.xlsx</td></tr>
<tr><td>Limitations</td><td>Scope 1 natural gas and scope 2 electricity
The energy consumption data are estimated values based on actual consumption data. It is preferred to have actual consumption data available for all buildings owned by municipalities.
Some primary school buildings are in possession of municipalities. It might be possible that for some primary school buildings the energy consumption is included in the GHG emissions of Municipalities and also in the education institutions.

Scope 1 fossil fuel by company cars
There is no recorded data per municipality regarding company cars, including details such as the number of cars, car types, and fuel types. The best possible result is achieved by using the current model(s). Many municipalities are actively striving to enhance the sustainability of their operations. As part of this effort, they are focusing on transitioning their vehicle fleets more sustainable. In the calculation method in this project, this development is not visible. As a result, the GHG emissions caused by company cars are a relative rough estimate and may deviate from the actual situation due to developments in the field of making the municipalities vehicle fleet more sustainable. Besides cars, municipalities also own other means of transport, such as scooters and (electric) bikes. The use of these means of transport is not included in the calculated GHG emissions for company cars.</td></tr>
<tr><td>SDG</td><td>SDG 13.2</td></tr>
<tr><td>Data quality estimate</td><td>Scope 1 natural gas and scope 2 electricity: data quality score 3.
The indicators for energy consumption are based on actual consumption from 2020. For the 2021 and 2022 data, estimates have been made based on the developments in energy consumption based on trends within the sector published by CBS.

Scope 1 company cars: data quality score 5.
The GHG emissions calculations are based on average car information. Make, model, and type are unknown, and the distance traveled is based on local or regional statistical data. Therefore, data quality score is 5.

<table>
<tr><th>Score</th><th>Quality requirement</th></tr>
<tr><td>1</td><td>Audited data or actual primary data</td></tr>
<tr><td>2</td><td>Non-audited data, or other primary data</td></tr>
<tr><td>3</td><td>Average data that is peer/(sub)sector-specific</td></tr>
<tr><td>4</td><td>Proxy data on the basis of region or country</td></tr>
<tr><td>5</td><td>Estimated data with very limited support</td></tr>
</table>
</td></tr>
</table>

Topic	Description
Data	Dataset public real estate
Data files	Dataset Maatschappelijk Vastgoed.csv
Data Source	Republiq
Year	2023
Last update	Not applicable
Date of download	Not applicable
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	Score 2 Data is obtained from Kadaster. However, this data is reliable it is not 100% accurate with regard to the actual list of buildings owned by municipalities.
Unit of measurement	Not applicable
Selections	Exclude the following buildings: - Buildings not owned by municipalities - Buildings with one of the following functions: living, industrial, retail, lodging
Data transformation	Not applicable
Data missing	Not applicable
Print Screens	Not applicable

Topic	Description
Data	Energy consumption public real estate
Data files	20230904 – Energieverbruik Maatschappelijk Vastgoed 2018-2022.xlsx
Data Source	Republiq
Year	2020, 2021 & 2022
Last update	Not applicable
Date of download	Not applicable
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	Score 2. Data is based on actual consumption data from a sample set of buildings.
Unit of measurement	kWh for electricity and Nm^3 for gas
Selections	Not applicable
Data transformation	Not applicable
Data missing	Not applicable
Print Screens	Not applicable

Topic	Description
Data	Number of employees working for the public administrations and government services sector
Data file	20230801_LISA-statistiek_(ordernr_202200020)_sector O.xlsx LISA-statistiek_(ordernr_202300020)_sector O.xlsx
Data Source	Lisa; het werkgelegenheidsregister van Nederland
Year	2020, 2021 & 2022
Last update	June 2022; August 2023

Date of download	Data purchased on 29-06-2022; 01-08-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Gemeenten\SDG 13.2 – CO2 emissies gemeenten\PCAF data
Data quality	Score 2 Data from LISA are based on observations/measurements of all locations of companies. Self-employed persons are taken into account as well. This makes it possible to present an overview of employment on both geographic and sectoral level.
Unit of measurement	Number of employees
Selections	Not applicable
Data transformation	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\SDG 13.2 – CO2 emissies gemeenten\PCAF data\Printscreens

Topic	Description
Data	Number of employees working for a general government administration
Data file	LISA-statistiek_(ordernr_202200019)_8411.xlsx LISA-statistiek_(ordernr_202300021)_8411.xlsx
Data Source	Lisa; het werkgelegenheidsregister van Nederland
Year	2020, 2021 & 2022
Last update	June 2022; August 2023
Date of download	Data purchased on 21-06-2022 and 03-08-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	SBI08-omschrijving: O-8411-Algemeen overheidsbestuur
Internal location	Klantgroepen\Gemeenten\SDG 13.2 – CO2 emissies gemeenten\PCAF data
Data quality	Score 2 Data from LISA are based on observations/measurements of all locations of companies. Self-employed persons are taken into account as well. This makes it possible to present an overview of employment on both geographic and sectoral level.
Unit of measurement	Number of employees
Selections	Not applicable
Data transformation	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\SDG 13.2 – CO2 emissies gemeenten\PCAF data\Printscreens

Topic	Description
Data	Number of employees working at provinces
Data file	20220926 berekening sbi 8411 zonder provincies_aangepast_18-1-23.xlsx in sheet: Banen provinciehoofdsteden 20230803 berekening sbi 8411 zonder provincie.xlsx in sheet: Banen provinciehoofdsteden
Data Source	A & O Fonds Provincies
Year	2020, 2021 & 2022
Last update	June 2022; August 2023
Date of download	21-09-2022; 01-08-2023
Link to webpage	https://personeelsmonitorprovincies.onderzoek.nl/index.cfm?action=main.report

Filters used to obtain the datafile	No filters used
Internal location	Klantgroepen\Gemeenten\SDG 13.2 – CO2 emissies gemeenten\PCAF data
Data quality	Score 2 Data is directly acquired from provinces, using a questionnaire. Data quality is therefore indicated as high.
Unit of measurement	Number of employees
Selections	Not applicable
Data transformation	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\SDG 13.2 – CO2 emissies gemeenten\PCAF data\Printscreens

Topic	Description
Data	Number of company cars owned by companies in the public administration and government services sector.
Data file	20231013 aantal bedrijfsautos 2017 2019 2020.xslx 20231013 aantal bedrijfsautos 2021.xlsx
Data Source	CBS Statline
Year	2019, 2020 & 2021 Data from 2019 is used for year 2020, 2020 for year 2021, 2021 for year 2022.
Last update	2019 & 2020: 24-01-2022 2021: 7-9-2023
Date of download	13-10-2023
Link to webpage	https://opendata.cbs.nl/statline/#/CBS/nl/dataset/81481NED/table?ts=1626174554210 https://opendata.cbs.nl/#/CBS/nl/dataset/85620NED/table?dl=975E8
Filters used to obtain th datafile	Onderwerp: Bedrijfsbestelauto's Bedrijfstakken/branches: O Openbaar bestuur en overheidsdiensten Bedrijfsgrootte/leeftijd bestelauto: Totaal Perioden: 2019, 2020, 2021
Internal location	Klantgroepen\Gemeenten\SDG 13.2 – CO2 emissies gemeenten\PCAF data
Data quality	Score 2 The research method of this data can be found here: https://www.cbs.nl/nl-nl/onze-diensten/methoden/onderzoeksomschrijvingen/korte-onderzoeksbeschrijvingen/bezit-en-gebruik-bestelauto-s The additional research report can be found here: https://www.cbs.nl/nl-nl/onze-diensten/methoden/onderzoeksomschrijvingen/aanvullende%20onderzoeksbeschrijvingen/bezit-en-gebruik-bestelauto-s Data comes from motor vehicle registration (RDW) and data is checked on content, quality and usability by Statistics Netherlands
Unit of measurement	Number of company cars
Selections	Not applicable
Data transformation	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\SDG 13.2 – CO2 emissies gemeenten\PCAF data\Printscreens

Topic	Description
Data	Average kilometers driven with a passenger car with a Dutch registration per year
Data file	20231012 km bedrijfsautos 2017 2019 2020.xslx 20231012 km bedrijfsautos 2021.xlsx

Data Source	Statistics Netherlands (CBS)
Year	2019, 2020 & 2021 Data from 2019 is used for year 2020, 2020 for year 2021, 2021 for year 2022.
Last update	2019: 10-11-2021 2020 & 2021: 11-11-2022
Date of download	2019: 23-10-2022 2020 & 2021: 26-07-2023
Link to webpage	https://opendata.cbs.nl/statline/#/CBS/nl/dataset/71107ned/table?ts=1626174732075 https://opendata.cbs.nl/#/CBS/nl/dataset/85396NED/table
Filters used to obtain the datafile	Gewichtsklasse leeggewicht: Totaal Leeftijd voertuig: Totaal Tenaamstelling: Totaal Brandstofsoort: Alle brandstofsoorten Onderwerp: Gemiddelde jaarkilometrage Perioden: 2019, 2020, 2021
Internal location	Klantgroepen\Gemeenten\SDG 13.2 – CO2 emissies gemeenten\PCAF data
Data quality	Score 2 The research method of this data can be found here: https://www.cbs.nl/nl-nl/onze-diensten/methoden/onderzoeksomschrijvingen/korte-onderzoeksbeschrijvingen/verkeersprestaties-personenauto-s The original data comes from the online kilometer registration (OKR) of the RDW. This data is reliable.
Unit of measurement	Kilometers
Selections	Not applicable
Data transformation	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Gemeenten\SDG 13.2 – CO2 emissies gemeenten\PCAF data\Printscreens

Topic	Description
Data	**Data to calculate scope 3 GHG emissions** Data about the standard business classification (‘standaard bedrijfsindeling’) comes from the Dutch Central Bureau of Statistics (CBS). CBS uses the standard business classification to classify business units by their main activity. Data regarding greenhouse gas (GHG) emissions by the Dutch economy is also sourced from the Dutch Central Bureau of Statistics (CBS). The data contains emissions of harmful substances to the air. The data is based on the environmental accounts. Environmental accounts links the system of national accounts and environmental statistics. Environmental accounts include both physical and monetary data on the environment. The main sources for the environmental accounts are the environmental statistics (mainly emission registrations), the energy statistics (mainly Dutch energy balance) and the national accounts. Data regarding greenhouse gas (GHG) emissions from the Dutch economy lags behind by one year, with the most recent available data being from 2021. Therefore, for scope 3 data from the years 2017, 2020, and 2021 have been used for the calculations of the years 2018, 2021, and 2022, respectively. The national accounts contain data on the monetary value of all produced goods and services in the Netherlands. These data come from the Dutch Central Bureau of Statistics (CBS). Because the GHG emissions by the Dutch economy are divided by the monetary value of all produced goods and services in the Netherlands, data of the monetary value of all produced goods and services in the Netherlands of the years 2017, 2020, and 2021 have been used for the calculations of the years 2018, 2021, and 2022, respectively.

	Data on the expenses of municipalities come from the Dutch Central Bureau of Statistics (CBS). The data is sourced directly from the municipalities themselves. They deliver the data directly to CBS in an uniform prescribed format. CBS does not check or edit these data. The OECD has developed the Classification of the Function of Government (COFOG), a system that categorizes government expenditure data from the System of National Accounts based on the specific purposes for which the funds are allocated. Municipal budgets are divided into 48 tasks (second level), clustered in 9 divisions (first level). The tasks indicate the purpose of the expenditure. The following tasks 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.
Calculation steps	**Scope 3** For the calculation of scope 3 only one economic category is relevant: 'Goods and Services'. This category describes the expenses of municipalities on goods and services. A number of subcategories can be distinguished. The following categories have been used in the calculation of scope 3: Category 3.1 describes expenses on the purchase or sale of areal positions; Category 3.2 are the purchases of sustainable goods and services. These are goods with a lifespan longer than one year; Category 3.5 describes the insourced employees; Category 3.8 contains other goods and services, such as tools, food, and other expenses. To calculate the GHG emissions for scope 3 for municipalities, it is necessary to have a value per subcategory mentioned above (3.1, 3.2, 3.5, and 3.8) that links GHG emissions (per kg) to expenses (in Euro). To come to this value per category (in kg CO_2-eq/Euro) as a first step, the most appropriate production sector(s) (the standard business format; SBI codes; CBS) has to be linked to the four mentioned categories. In a next step, using the environmental accounts, the expenses have been linked to the emission data. First, the description of the 4 mentioned categories (3.1, 3.2, 3.5, and 3.8) has been checked.[22] According to the detailed description, the most appropriate production sector(s) has/have been linked to the category (Table 1). Category 3.1 has been linked to only one sectoral production category, whereas categories 3.2, 3.5, and 3.8 have been linked to multiple sectoral production categories. The share of each production sector per subcategory is unknown. Therefore, the researchers at Het PON & Telos have estimated the proportion of each production sector within each category. The allocation was determined using an estimate of the proportional contribution of relevant industries to the expenditure within each subcategory, as indicated in Table 2. Table 1. The categories with the linked sectoral production category Category: SBI code 3.1: Rental and trading real estate (L) 3.2: Industry (C); construction industry (F); wholesale and retail, and repair of motor vehicles (G); rental and trading of real estate (L); consultancy, research, rental of movable property, other services (M/N); public administration, public services and compulsory social security (O). 3.5: Consultancy, research, rental of movable property, other services (M/N); public administration, public services and compulsory social security (O). 3.8: Extraction of minerals (B); industry (C); production, distribution and trading of electricity, natural gas, steam and chilled air (D); water collection and distribution; waste and wastewater management and remediation (E); rental of movable property and other services (N);

[22] https://findo.nl/content/30---Goederen-en-diensten

	public administration, public services and compulsory social security (O).

Table 2. The share of each production sector per subcategory

Category	Share per SBI code
3.1	100% L
3.2	20% C-F-G-L 10% M/N 10% O
3.5	50% M/N 50% O
3.8	20% B-C-D-E 10% N 10% O

Based on the method described above the composition per production sectors has been known per subcategory (in %) (A). Using the environmental accounts, the total GHG emissions has been known per production sector (in kg) and the annual monetary value per production sector has been known (in Euro). So, per production sector the kg GHG emissions per Euro has been calculated (B). Knowing A and B for each subcategory the specific kg GHG emissions per Euro expenditure (C) has been calculated.

For 2022, this resulted in the values for kg CO_2 per Euro (C) presented in Table 3. To have insight in how this has changed over also the values used for 2021 and 2018 are shown.

Table 3 The kg CO_2 equivalent per euro that is used in the calculation.

Year	2022	2021
Category 3.1	0.006 kg CO_2-eq / Euro	0.006 kg CO_2-eq / Euro
Category 3.2	0.19 kg CO_2-eq / Euro	0.20 kg CO_2-eq / Euro
Category 3.5	0.03 kg CO_2-eq / Euro	0.03 kg CO_2-eq / Euro
Category 3.8	0.44 kg CO_2-eq / Euro	0.47 kg CO_2-eq / Euro

The IV3 spending database of all municipalities has been used (CBS, Statline). From this database the categories 3.1, 3.2, 3.5, and 3.8 have been selected. Only the positive expenditures have been taken into account. The expenditure of the municipality per sub-function and category has been multiplied by the kg CO_2-eq per Euro (C). This has resulted in kg GHG emissions per expenditure (D). Per municipality these values for all the subfunctions x subcategories have been added up to result in scope 3 per municipality in kg. This has been divided by 1000 to result in ton GHG emissions. Finally, the GHG emissions have been calculated per municipality.

To calculate the emission factors for category 3.1, 3.2, 3.5, and 3.8 data of 2020 and 2021 have been used for 2021 and 2022, respectively. However, expenditure of the municipalities, outstanding loans, and total balance sheet of the municipalities have been used of 2021 and 2022 for 2021 and 2022, respectively.

Limitations	**Scope 3** A risk of double counting stems from that local and regional government related collaborations, companies, and projects might be included in the financial and emission reporting of municipalities and provinces. This can only be assessed by individual entities, and this has not been corrected for in this report. An uncertainty in the method described under calculations earlier in this factsheet is that the exact share of each production sector per category is unknown. It was not possible to specify this by more detailed information from several municipalities. Therefore, a share was assumed by the researchers of Het PON & Telos.

	Another limitation is the possible double counting in scope 1 and 2 in comparison to scope 3. It is assumed that the expenses on natural gas use and electricity use are included in the spending on category 3.8. For that reason, there might be some double counting in scope 1, 2, and 3. As mentioned earlier scope 3 is not corrected for this. The emission factor (kg CO_2-eq / Euro) has been calculated with data from 2020 and 2021 for 2021 and 2022, respectively, because more recent data was not available.
SDG	SDG 13.2
Data quality estimate	Scope 3: data quality score 4. The GHG emissions are calculated based on economic activity. The expenses made in the categories 3.1, 3.2, 3.5, and 3.8 were multiplied by a value for kg CO_2-eq / Euro. The value for kg CO_2-eq / Euro has been calculated based on proxy data on the basis of country. Therefore, data quality is score 4.

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Standard business format: description per sectoral production category. The description of the sectoral production categories in this document is used to link categories of municipalities their finances to one or more sectoral production categories.
Data file	2022EP06 SBI Structuur.pdf
Data Source	CBS
Year	2022
Last update	2022
Date of download	31-10-2022
Link to webpage	https://www.cbs.nl/nl-nl/onze-diensten/methoden/classificaties/activiteiten/sbi-2008-standaard-bedrijfsindeling-2008/de-structuur-van-de-sbi-2008-versie-2018-update-2022
Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Gemeenten\SDG 13.2 - CO2 emissies gemeenten\PCAF data
Data quality	Not applicable
Unit of measurement	Not applicable
Selections	Not applicable
Data transformation	Not applicable
Data missing	Not applicable
Print screens	Klantgroepen\Gemeenten\SDG 13.2 – CO2 emissies gemeenten\PCAF data\Printscreens 20223110 SBI codes.PNG

Topic	Description
Data	GHG emissions by the Dutch economy
Data file	20230719 emissies naar lucht 2017 2020 2021.xlsx (for 2020 and 2021) 05092022 emissies naar lucht 2017 2019 2020.xlsx (for 2019)
Data Source	CBS Statline

Year	2019, 2020 and 2021
Last update	05-12-2022
Date of download	19-07-2023
Link to webpage	https://opendata.cbs.nl/#/CBS/nl/dataset/83300NED/table?dl=5932E
Filters used to obtain the datafile	Onderwerp: Broeikasgassen (klimaatverandering); Broeikasgas-equivalent Perioden: 2019, 2020, 2021 Nederlandse economie: Economische activiteiten A, B, C, D, E, F, G-I, J, K, L, M-N, O-Q, R-U
Internal location	Klantgroepen\Gemeenten\SDG 13.2 - CO2 emissies gemeenten\PCAF data
Data quality	Score 4 The research method used to obtain the data can be found here: https://www.cbs.nl/nl-nl/onze-diensten/methoden/onderzoeksomschrijvingen/korte-onderzoeksbeschrijvingen/milieurekeningen Data is based on environmental accounts. Important sources for the environmental accounts are environmental statistics, such as emission registrations, energy statistics (Dutch energy balance) and a macro economic system used by CBS. It is data on the basis of country and therefore data quality score is 4.
Unit of measurement	GHG emissions: mln kilogram
Selections	Not applicable
Data transformation	Calculations made with the data are described in the section calculation steps of municipalities (scope 3).
Data missing	Not applicable
Print screens	Klantgroepen\Gemeenten\SDG 13.2 - CO2 emissies gemeenten\PCAF data\Printscreens 20230719 emissies naar lucht 2017 2020 2021.png (for 2020 and 2021) 20220905 emissies naar lucht 2017 2019 2020.png (for 2019)

Topic	Description
Data	The monetary value of all produced goods and services in the Netherlands
Data file	20230719 bbp 2017 2020 2021.xlsx (for 2020 and 2021) 20221028 bbp 2017 2019 2020.xlsx (for 2019)
Data Source	CBS Statline
Year	2019, 2020 & 2021
Last update	23-06-2023
Date of download	19-07-2023
Link to webpage	https://opendata.cbs.nl/#/CBS/nl/dataset/84087NED/table?ts=1601538240382
Filters used to obtain the datafile	Perioden: 2019/2020/2021 Onderwerp: BBP vanuit de productie: Waarde prijsniveau 2015 Bruto toegevoegde waarde basisprijzen; A, B-E, B, C, D, E, F, G-I, J, K, L, M-N, O-Q, R-U
Internal location	Klantgroepen\Gemeenten\SDG 13.2 - CO2 emissies gemeenten\PCAF data
Data quality	Score 3 Based on registered production statistics. The data quality has increased due to a number of checks and control functions in the method. The research method used to obtain the data can be found here: https://www.cbs.nl/nl-nl/onze-diensten/methoden/onderzoeksomschrijvingen/korte-onderzoeksbeschrijvingen/nationale-rekeningen
Unit of measurement	Mln Euro
Selections	Not applicable
Data transformation	Calculations made with the data are described in the section calculation steps of municipalities (scope 3)

Data missing	Not applicable
Print screens	Klantgroepen\Gemeenten\SDG 13.2 - CO2 emissies gemeenten\PCAF data\Printscreens 20230719 opbouw bbp 2017 2020 2021.png (for 2020 and 2021) 20221028 bbp 2017 2019 2020.png (for 2019)

Topic	Description
Data	Expenses of all Dutch municipalities per IV3/COFOG code
Data file	20210923 iv3 2020 gemeente.xlsx 20220922 iv3 2021 gemeente.xlsx 20230929 iv3 2022 gemeente.xlsx
Data Source	CBS Statline
Year	2020, 2021 & 2022
Last update	2020: 22-09-2021 2021: 22-09-2022 2022: 22-09-2023
Date of download	22-09-2022; 22-09-2023
Link to webpage	2020: StatLine - Gemeenten 2020 onbewerkte Iv3-data (cbs.nl) 2021: https://iv3statline.cbs.nl/#/IV3/nl/dataset/45054NED/table 2022: https://iv3statline.cbs.nl/#/IV3/nl/dataset/45059NED/table?ts=1691070420108
Filters used to obtain the datafile	Onderwerp: 2e plaatsing Taakveld/balanspost: alle taakvelden 0 t/m 8 Categorie: Lasten: L3.1 grond, L3.2 Duurzame goederen, L3.5.1. Ingeleend personeel, L3.8 Overige goederen en diensten Verslagsoort: Jaarrekening
Internal location	Klantgroepen\Gemeenten\SDG 13.2 - CO2 emissies gemeenten\PCAF data
Data quality	Score 2 High data quality. Data is directly supplied by municipalities from internal accounting systems. Provinces deliver the data to CBS, the data has not been edited by CBS.
Unit of measurement	Euro
Selections	Not applicable
Data transformation	Not applicable
Data missing	2018: Data of municipalities 'Zederik', 'Vianen' and 'Leerdam' are missing, and 2017 data is used for those municipalities. 2022: Data of municipalities 'Almelo', 'Dordrecht' and 'Twenterand' are missing, therefore 2021 data has been used for those municipalities.
Print screens	Klantgroepen\Gemeenten\SDG 13.2 -CO2 emissies gemeenten\PCAF data\Printscreens 20221111 Downloadpagina CBS Statline iv3 2020 gemeente.PNG 20221111 Downloadpagina CBS Statline iv3 2021 gemeente.PNG 20230929 Downloadpagina CBS Statline iv3 2022 gemeente.PNG

List of the calculation sheets	Location
Banen_sectorO_gemeente_2018_2020_2021_2022.csv LeningportefeuilleBNG_gemeente_2018_2020_2021_2022.csv Aardgas_Elektra_Gemeente.csv Banen_gemeente_2018_2020_2021_2022.csv Passiva_gemeente_2018_2020_2021_2022.csv Emissiefactoren.csv 20230719 gemeente scope 3 2020.xlsx 20230719 gemeente scope 3 2021.xlsx	Klantgroepen\Gemeenten\SDG 13.2 - CO2 emissies gemeenten\PCAF data\Brondata voor SQL

20230719 gemeente scope 3 2022.xlsx Gemeente scope 3_2018_2020_2021_2022.csv	
20230801 script BNG gemeente 2020.ipynb 20230801 script BNG gemeente 2021.ipynb 20230801 script BNG gemeente 2022.ipynb	Klantgroepen\Gemeenten\SDG 13.2 - CO2 emissies gemeenten\PCAF data\Notebooks SQL
pBNG.vgemeente_2020_IndividueleKlanten.xlsx pBNG.vgemeente_2021_IndividueleKlanten.xlsx pBNG.vgemeente_2021_IndividueleKlanten.xlsx	Klantgroepen\Gemeenten\SDG 13.2 - CO2 emissies gemeenten

4 Social housing associations

4.1 General factsheet

Topic	Description
Portfolio covered	89.4% of BNG bank's portfolio is covered for this costumer group. The percentage is in indication of the completeness of the dataset. It is calculated by looking at the collected data for all indicators for the clients in the loan portfolio of the BNG Bank. The percentage is lower than 100% if there are missing data. The missing data are either not available, or it was not possible to collect or calculate these data correctly.
Indicators	- Energy consumption per social housing association – electricity; - Energy consumption per social housing association – natural gas; - Development costs - livability, maintenance, and improvements; - Amount of housing stock social houses per social housing association; - Financial accessibility social housings; - Energy performance social housing; - GHG emissions per social housing association.
Limitations	-

4.2 Factsheets per indicator

4.2.1 Energy consumption per social housing association – electricity (kWh) and natural gas (m^3)

Topic	Description
Data	Data on the electricity use and natural gas use is based on connection registers of energy network companies. Due to privacy regulations, it is not possible to collect this data for individual houses. The data has therefore been collected for small clusters of similar houses. The data has been aggregated to the level of housing association. Data on the number of houses and total surface per social housing association come from 'Kadaster'.
Calculation steps	The following steps have been performed: 1. Inventory of houses owned by housing associations 2. Joining consumption data 1. *Inventory of houses owned by housing associations* From 'Kadaster' Republiq has obtained data of the property of housing associations. For each housing association it is known which houses they obtain, what the surface of each house is and to which energy class it belongs. Republiq has calculated the number of houses owned by each housing association and the total surface of these houses. From BNG Bank, Republiq has obtained an overview of which housing associations are clients. This list has been joined with the data from 'Kadaster' in order to add the number of houses and surface owned by the housing association, where possible. 2. *Joining consumption data* At the beginning of 2023, the energy consumption data was requested from the three largest network operators (Enexis, Liander and Stedin). Due to privacy reasons it is not allowed to provide consumption data for individual buildings. It is allowed to provide

<table>
<tr><td></td><td>these for clusters of buildings (10 to 15 buildings). From the network operators Republiq has received per cluster the standard annual consumption (in Dutch: standaard jaarverbruik (SJV)[23]). Republiq has divided this by the average surface of buildings from a cluster to obtain consumption data per m^2. This consumption data per m^2 has been assigned to the individual houses belonging to a cluster. Next, Republiq has performed a check on outliers such that only reliable data remained. Per housing association Republiq has calculated the average consumption data per m^2 and has multiplied this with the total surface that is owned by the housing association in order to get an estimate of the total usage of electricity and gas.

Republiq has provided Het PON & Telos with the following data per social housing association to calculate GHG emissions:
- Total electricity consumption (in kWh)
- Total gas consumption (in Nm^3)</td></tr>
<tr><td>Limitations</td><td>- Some of the housing associations from the clients list from BNG Bank were not present in the data set of Republiq because these housing associations are not members of the Aedes trade association. For these housing associations there is no data available on the number of houses and surface area owned, and therefore no consumption data is available. This applies to the housing associations that are not affiliated with Aedes.
- Consumption data has only been collected from the three largest network operators. For housing associations operating solely outside the regions of these operators, Republiq doesn't have consumption data available.
- Due to privacy regulations it is not possible to collect energy data for individual houses. The data is therefore collected for small clusters of similar houses. The data has been aggregated to the level of housing association.</td></tr>
<tr><td>SDG</td><td>SDG 7.3</td></tr>
<tr><td>Data quality estimate</td><td>2
Primary data on actual building energy consumption is available.
According to option 1b in Table 5-14 on page 92 of the report Financed Emissions. The global GHG accounting & reporting standard Part A[24] the data quality is 2.
Due to privacy regulations, it is not possible to collect this data for individual houses. The data is therefore collected for small clusters (10 to 15 buildings) of similar houses, which is more subsector specific. The data has been aggregated to the level of housing association. However, because energy consumption data is more specific than sector specific the data score is 2.

<table><tr><th>Score</th><th>Quality requirement</th></tr><tr><td>1</td><td>Audited data or actual primary data</td></tr><tr><td>2</td><td>Non-audited data, or other primary data</td></tr><tr><td>3</td><td>Average data that is peer/(sub)sector-specific</td></tr><tr><td>4</td><td>Proxy data on the basis of region or country</td></tr><tr><td>5</td><td>Estimated data with very limited support</td></tr></table></td></tr>
</table>

[23] "Standaard jaarverbruik" 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 gaspressure.

[24] https://carbonaccountingfinancials.com/standard. PCAF(2022). Financed Emissions. The global GHG accounting & reporting standard Part A.

Topic	Description
Data	Consumption data per housing association
Data files	20230717 - Energieverbruik en energielabels woningcorporaties
Data Source	Republiq
Year	2020, 2021 & 2022
Last update	Not applicable
Date of download	Not applicable
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	2 Consumption data is based on the average consumption of a cluster with similar houses
Unit of measurement	kWh for electricity and m^3 for natural gas
Selections	Not applicable
Data transformation	Not applicable
Data missing	Consumption data is only available for houses located in the areas of the three largest network operators (Enexis, Stedin, and Liander).
Print Screens	Not applicable

Topic	Description
Data	Electricity use (kWh) and natural gas use (m^3) per housing association
Data files	Original file : 20231103 – BNG_energieverbruik_woningcorporaties.xlsx Edited file : 231012 nulmeting eenmeting tweemeting aardgasverbruik corporatiewoningen.xlsx
Data Source	Republiq
Year	2020, 2021 and 2022
Last update	Not applicable
Date of download	Received by MSafe 6-9-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	From original file only column woningcorporatie, kvk_nummer, elektra_totaal, gas_totaal has been selected.
Internal location	Original file: Klantgroepen\Woningcorporaties\SDG_7.3_Aardgasverbruik corporatiewoningen\Ruwe data Klantgroepen\Woningcorporaties\SDG_7.3_Elektriciteitsverbruik corporatiewoningen\Ruwe data Edited file: Klantgroepen\Woningcorporaties\SDG_7.3_Aardgasverbruik corporatiewoningen Klantgroepen\Woningcorporaties\SDG_7.3_Elektriciteitsverbruik corporatiewoningen
Data quality	2 Energy consumption data is based on the average consumption of a cluster with similar houses
Unit of measurement	kWh for electricity and m^3 for natural gas
Selections	Not applicable
Data transformation	Not applicable
Data missing	Energy consumption data is only available for houses located in the areas of the three largest network operators (Enexis, Stedin, and Liander).

Print Screens	Klantgroepen\Woningcorporaties\SDG_7.3_Aardgasverbruik corporatiewoningen\Printscreen Klantgroepen\Woningcorporaties\SDG_7.3_Elektriciteitsverbruik corporatiewoningen\Printscreen

4.2.2 Energy performance social housing corporations

Topic	Description
Data	All data used for this indicator comes from the Aedes benchmark 'individuele benchmarkpositie van corporaties in 2020, 2021 and 2022'.
Calculation steps	In 2022, the Aedes benchmark has been published for the ninth year and has developed into a leading instrument for the benchmark of social housings associations. The benchmark gives insight in the performance of social housing associations and enables comparison between housing associations on several indicators. A total of 280 housing associations are represented in the Aedes benchmark. That represents 98% of all Dutch social housing associations. Since the new method for measuring the energy performance of homes has been in effect, the energy label is determined based on the energy label value (EP2). The EP2 value refers to the primary fossil energy use per square meter (kilowatt hours per square meter). This value is a measure of the overall energy performance of the home. Homes with a very good (low) EP2 value can achieve energy label A++++. Homes with a very poor (high) EP2 value have energy label G.
Limitations	The participating associations provide the data for the Sustainability performance annually in the months of June and July. These individual files are combined into a total file (Shaere). The 2022 Shaere file contains 2.18 million independent homes from 247 corporations. With this, the Shaere file provides a good and representative picture of the energy performance of the housing association sector. Shaere does not include all housing associations. At the end of 2021, the total housing association stock consisted of 2.23 million independent homes.
SDG	SDG 11.1: Sustainable cities and communities
Data quality estimate	All the data is primary data which is obtained directly from the social housing associations. No calculations or estimations needed; the data is non-audited. Data quality score = 2

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Benchmark with data from all social housing associations
Data file	Aedes-benchmark 2022 individuele resultaten corporaties
Data Source	Aedes
Years	2020, 2021 & 2022
Last update	18-11-2021
Date of download	09-08-2023
Link to webpage	https://aedes.nl/aedes-benchmark/benchmarkresultaten-en-publicaties
Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Woningcorporaties\SDG 7.3 Energieprestatie

Data quality estimate	2
Unit of measurement	Percentages
Selections	Not applicable
Data missing	There are 17 missings
Print Screens	Klantgroepen\Woningcorporaties\SDG 7.3 Energieprestatie\printscreens

4.2.3 Amount of housing stock social houses per social housing association

Topic	Description
Data	Number of total rental units per year per social housing association. Data on new owner-occupied units obtained from dVi woningcorporaties: https://data.overheid.nl/
Calculation steps	The data is obtained by performing the following steps: Download the number of independent rental units per year per social housing association from Aedes Datacentrum. By downloading the dVi files. Chapter one of dVi contains the names and institution numbers of the social housing associations. Chapter two contains the number of new realized units per year and the corresponding institution number. By joining both chapters on institution number, the total number of units per social housing association are obtained. The results of both steps are joined on name of social housing association. Multiple social housing associations have merged in the period 2016-2019. The values in this dataset are given for each social housing association for each year. When an institution does not longer exist after a merge, the values are set at missing from the year of the merge. From that year onwards, the values of new units are added to the values of the institution that continues to exist or is established. The column 'corporatie'_huidig' contains the current name of each social housing association.
Limitations	Not applicable
SDG	SDG 11.1
Data quality estimate	1 - Audited data or actual primary data

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Number of total rental units per year per social housing association
Data file	Aantal verhuureenheden 0-1-2 meting.xlsx
Data Source	Aedes Datacentrum
Year	2016-2021
Last update	09-01-2023
Date of download	20-11-2023
Link to webpage	https://aedesdatacentrum.nl/jive/?Var=h_dvicbs1,h_dvicbs2,e_hucorp,e_huovv,tot_kp,e_huonb,p_e_hucorp,p_e_huovv,p_tot_kp,p_e_huonb&Mostrecentperiods=5&geolevel=nederland&geoitem=1&geocompare=
Filters used to obtain the datafile	Year: 2016, 2017, 2018, 2019, 2020, 2021 Subjects: Zelfstandige huurwoningen DAEB, Zelfstandige huurwoningen niet-DAEB, nieuwbouw woongelegenheden Level: woningcorporatie
Internal location	Klantgroepen\Woningcorporaties\SDG 11.1. Housing stock social houses
Data quality estimate	1
Unit of measurement	Number of rental units
Selections	Not applicable
Data missing	Not applicable

Print Screens	Klantgroepen\Woningcorporaties\SDG 11.1. Housing stock social houses

4.2.4 Financial accessibility social housings

Topic	Description
Data	All data used for this indicator comes from the Aedes benchmark 'individuele benchmarkpositie van corporaties in 2022'.
Calculation steps	In 2022, the Aedes benchmark has been published for the ninth year and has developed into a leading instrument for the benchmark of social housings associations. The benchmark gives insight in the performance of social housing associations and enables comparison between housing associations on several indicators. A total of 280 housing associations are represented in the Aedes benchmark. That represents 98% of all Dutch social housing associations. Social housing dwellings are considered to be financial accessible when the rental price is categorized as 'tot de aftoppingsgrens'. This means the rental price of the dwelling can't exceed a certain price. For 2022, the 'aftoppingsgrens' was €633.25 for one- and two-person households and €678.66 for multi-person households. The 'liberalisatiegrens' is the maximum rent that can be charged for a social housing dwelling. In 2022, the 'liberalisatiegrens' was €763.66. If this price is exceeded, it is no longer considered to be a social housing dwelling. All the prices are per month. The percentage of financial accessible social housing dwellings is calculated by Aedes. Aedes divides the number of allocated dwellings in rental price category 'tot de aftoppingsgrens' by the number of allocated dwellings in rental price category 'tot de liberalisatiegrens'. This gives the percentage of allocated dwellings 'tot de aftoppingsgrens' within the total allocated social housing dwellings. The exact number and definitions can be find : https://aedes.nl/huurbeleid-en-betaalbaarheid/huurbeleid-2022
Limitations	No limitations
SDG	SDG 11.1: Sustainable cities and communities
Data quality estimate	All the data is primary data which is obtained directly from the social housing associations. No calculations or estimations needed; the data is non-audited. Data quality score = 2

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Benchmark with data from all social housing associations
Data file	Aedes-benchmark 2022 individuele resultaten corporaties
Data Source	Aedes
Years	2020, 2021 & 2022
Last update	18-11-2021
Date of download	09-08-2023
Link to webpage	https://aedes.nl/aedes-benchmark/benchmarkresultaten-en-publicaties

Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Woningcorporaties\SDG 11.1 Betaalbare huurwoningen\Ruwe data
Data quality estimate	2
Unit of measurement	Percentages
Selections	Not applicable
Data missing	There are 17 missings
Print Screens	Klantgroepen\Woningcorporaties\SDG 11.1 Betaalbare huurwoningen\Printscreens

4.2.5 GHG emissions per social housing association

Topic	Description
Data	Data on the electricity use and natural gas use is based on connection registers of energy network companies. Due to privacy regulations, it is not possible to collect this data for individual houses. The data has therefore been collected for small clusters of similar houses. The data has been aggregated to the level of housing association. Data on the number of houses and total surface per social housing association come from 'Kadaster'.
Calculation steps	**Scope 1 natural gas use & scope 2 electricity use** The following steps have been performed by Republiq: 1) Inventory of houses owned by housing associations 2) Joining consumption data 1. Inventory of houses owned by housing associations Republiq acquired housing association property data from 'Kadaster'. For each housing association Republiq knows the number of houses they own, what the surface of each house is and to which energy class it belongs. Republiq has calculated the number of houses owned by each housing association and the total surface of these houses. From BNG Bank, Republiq obtained an overview of which housing associations are clients according to the loan portfolio of 31-12-2023. Republiq combined this list from BNG Bank with data from 'Kadaster' in order to add the number of houses and surface owned by each housing association, where possible. 2. Joining consumption data At the start of 2023, energy consumption data was requested from the three major network operators (Enexis, Liander, and Stedin) in the Netherlands. Due to privacy reasons the network operators are not allowed to provide 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 jaarverbruik' (SJV)[25]) has been provided. Republiq has divided the annual consumption data by the average surface of buildings from a cluster to obtain consumption data per m^2. The consumption data per m^2 have been assigned to the individual houses belonging to a cluster. Following that, Republiq conducted an outlier check, ensuring that only reliable data remained. The average consumption data per m^2 per housing association is multiplied by the total surface that is owned by the housing association in order to get an estimate of the total usage of electricity and gas. Republiq has provided Het PON & Telos with the following data per social housing association to calculate GHG emissions: - Total electricity consumption (in kWh)

[25] 'Standaard jaarverbruik' 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 gaspressure.

	- Total gas consumption (in Nm^3) The following step has been performed by Het PON & Telos: Het PON & Telos used these data in order to make the final calculations for both Scope 1 natural gas use and Scope 2 electricity use. The total electricity and natural gas use have been multiplied by the emission factor, from the same year as the data. For Scope 1 Natural gas use the emission factor Natural gas (Nm^3) has been used. For Scope 2 Electricity use the emission factor Electricity from unknown sources (kWh) has been used. The following emission factors have been used: - Electricity unknown source: 0.405 kg CO_2-eq /kWh (2020 and 2021) and 0.369 kg CO_2-eq /kWh (2022); - Natural gas: 1.785 kg CO_2-eq /Nm^3 (2020 and 2021) and 1.788 kg CO_2-eq /Nm^3 (2022). **Scope 2: District heating** The use of district heating per social housing association is unknown. Hence, it was necessary to make an estimation. To ensure the highest level of accuracy, several calculations had to be performed. The CBS Microdata contains information on the use of district heating of all Dutch houses. Within the CBS Microdata database, this dataset has been combined with another dataset containing information about homeowners. Only houses owned by social housing associations have been incorporated in the calculation. CBS defines house as: the smallest unit of use located within one or more buildings and suitable for residential purposes, and accessible through a private entrance from the public road, a yard or a shared traffic area. Examples include detached houses, single-family houses, apartment or porch houses, student houses. All residential objects in the Basic Registration of Addresses and Buildings (BAG) with at least a residential function and possibly one or more other use functions are considered as a house. So, both self-contained and non-self-contained homes are included in this data. Per municipality, the use of district heating for all houses owned by social housing associations has been calculated. Outside the CBS Microdata database, the use of district heating per social housing association has been calculated. The 'Inspectie van de leefomgeving en transport' has data on the number of independent and non-independent houses per social housing association per municipality. According to this data the percentage of houses owned by the social housing associations has been calculated per municipality. The use of district heating per municipality for all houses owned by social housing associations has been multiplied by the ratio of the number of houses of one particular social housing association versus total number of houses of all social housing associations in one municipality. For each social housing association, the use of district heating per municipality has been added up to result in the total district heating use for that particular social housing association. The use of district heating in GJ has been multiplied by the emission factor for average heating networks to result in kg GHG emissions. These emissions have been divided by 1000 to result in ton GHG emissions. The following emission factor has been used: - Average heating networks: 23.4 kg CO_2 / GJ (2021 and 2022) *For calculating the GHG emissions for district heating the emission factor of the year 2022 has been used also for 2021. CO2emissionfactor.nl doesn't give some advice about whether the emission factor from the year 2022 should be used retroactively[26]. Because end users have no influence on which heating network they are using, CO2emissiefactor.nl published an average emission factor for heat from large heating networks since 2022. The difference with the emission factor in 2021 is large (23.4 for 2022 vs. 32.53 for 2021). To prevent that the GHG emissions change (decrease) only due to the fact that the used emission factor for the year 2021 is*

	higher than for the year 2022, the emission factor of the year 2022 is also used for 2021. The sustainable performance of large heating network improves over time. The emission factors can be found in the folder: Klantgroepen, file: 20230717 emissiefactoren met bron.xlsx
Limitations	Some of the housing associations from the clients list from BNG Bank were not present in the data set of Republiq because these housing associations are not members of the Aedes trade association. For these housing associations there is no data available on the number of houses and surface area owned, and therefore no consumption data is available. This applies to the housing associations that are not affiliated with Aedes. Consumption data has only been collected from the three largest network operators. For housing associations operating solely outside the regions of these operators, Republiq doesn't have consumption data available. Due to privacy regulations, it is not possible to collect energy data for individual houses. The data is therefore collected for small clusters of similar houses. The data has been aggregated to the level of housing association. For energy consumption the standard annual consumption (in Dutch 'standaard jaarverbruik'(SJV)[27]) has been used. 'Standaard jaarverbruik' 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 gaspressure. **Scope 2 District heating** Unfortunately, Het PON & Telos has no data available regarding the allocation of houses 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 houses per social housing association versus the total number of houses of all social housing associations in one municipality. Enhancing the accuracy of the data is possible by identifying which houses are owned by specific social housing associations. This will have no effect on the GHG emissions of the sector in total but influences the GHG emissions at sector level attributed to the bank. The most recent data on heat used from a heating network of social housing associations available from CBS is from the year 2021. Therefore, the data on heat used from a heating network used for this report is from the year 2021 instead of 2022. The GHG emissions of the social housing corporations itself (scope 1, 2, and 3) are not included in this report.
SDG	SDG 13.2
Data quality estimate	2 Primary data on actual building energy consumption is available. According to option 1b in Table 5-14 on page 92 of the report Financed Emissions. The global GHG accounting & reporting standard Part A[28] the data quality is 2. Due to privacy regulations it is not possible to collect this data for individual houses. The data is therefore collected for small clusters (10 to 15 buildings) of similar houses, which is more subsector-specific. The data has been aggregated to the level of housing association. However, because energy consumption data is more specific than sector specific the data score is 2.

[27] 'Standaard jaarverbruik' 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 gaspressure.

[28] https://carbonaccountingfinancials.com/standard. PCAF(2022). Financed Emissions. The global GHG accounting & reporting standard Part A.

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Corporatiebezit Kadaster
Data files	20230125 - Corporatiebezit kadaster.csv
Data Source	Republiq
Year	2023
Last update	Not applicable
Date of download	Not applicable
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	Score 1 Data per social housing association specific.
Unit of measurement	Not applicable
Selections	Not applicable
Data transformation	Not applicable
Data missing	A few housing associations that are clients at BNG are missing in this dataset.
Print Screens	Not applicable

Topic	Description
Data	Consumption data per housing association
Data files	20230717 - Energieverbruik en energielabels woningcorporaties
Data Source	Republiq
Year	2020, 2021 & 2022
Last update	Not applicable
Date of download	Not applicable
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	Score 2 Consumption data is based on the average consumption of a cluster with similar houses
Unit of measurement	kWh for electricity usage and Nm^3 for gas usage
Selections	Not applicable
Data transformation	Not applicable
Data missing	Consumption data is only available for houses located in the areas of the three largest network operators (Enexis, Stedin and Liander).
Print Screens	Not applicable

Topic	Description
Data	Supply of energy to social housing corporations

Data file	(datafile received from Republiq): 20231103 - BNG_energieverbruik_woningcorporaties.xlsx
Data Source	Not applicable
Year	2020, 2021 & 2022
Last update	Not applicable
Date of download	Not applicable
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Woningcorporaties\SDG 13.2 – CO2 emissies\PCAF data
Data quality	Score 2 Primary data on actual building energy consumption is available. According to option 1b in Table 5-14 on page 92 of the report PCAF (2022)[29] the data quality is 2. Due to privacy regulations, it is not possible to collect this data for individual houses. The data is therefore collected for small clusters (10 to 15 buildings) of comparable houses, which is subsector specific. This data has been aggregated to the level of a housing association. However, due to the specificity of energy consumption data compared to sector-specific data, the data score is 2.
Unit of measurement	Natural gas: Nm^3 Electricity: kWh
Selections	Not applicable
Data transformation	Not applicable
Data missing	Not applicable
Print Screens	Not applicable

Topic	Description
Data	Number of houses owned by housing associations per municipalities
Data file	Original files: dvi2019 H2.xlsx dvi2020 H2.xlsx dvi2021 H2.xlsx Edited files: 20221021 aantal woningen 2019.xlsx 20221021 aantal woningen 2020.xlsx 20230717 aantal woningen 2021.xlsx
Data Source	Inspectie Leefomgeving en Transport (ilent); Autoriteit Woningcorporaties
Year	2019, 2020 & 2021
Last update	Not applicable
Date of download	07-17-2023
Link to webpage	https://data.overheid.nl/dataset/verantwoordingsinformatie-woningcorporaties-dvi2021-hfd2
Filters used to obtain the datafile	Filters: DEAB_Indicatie_Ultimo: J & N; Soort_Instelling_Ultimo: TI; EenheidSoort: WoonZelfst & WoonOnzelfst.
Internal location	Klantgroepen\Woningcorporaties\SDG 13.2 – CO2 emissies\PCAF data
Data quality	Score 1 Audited data per social housing association specific.
Unit of measurement	Number of dwellings
Selections	Not applicable

[29] https://carbonaccountingfinancials.com/standard.
PCAF(2022). The Global GHG Accounting and Reporting Standard Part A: Financed Emissions. Second edition.

Data transformation	To perform the calculations the following transformations have been done: Data of the year 2019 and 2020 was transformed to the 2021 municipality division.
Data missing	Not applicable
Print Screens	Klantgroepen\Woningcorporaties\SDG 13.2 – CO2 emissies\PCAF data\Printscreens 20221018 dvi 2019 H2.png 20221018 dvi 2020 H2.png 20230717 dvi 2021 H2.png

List of the calculation sheets	Location
Aardgas en elektra BNG.csv Leningen woco BNG.csv Stadsverwarming woco 2017 2019 2020 2021.csv Woco passiva 2018 2020 2021.csv Woningen woningcorporaties per gemeente 2017 2019 2020 en 2021.csv Emissiefactoren.csv	Klantgroepen\Woningcorporaties\SDG 13.2 – CO2 emissies\PCAF data\Brondata voor SQL
20230913 script woco BNG 2020.ipynb 20230913 script woco BNG 2021.ipynb 20230913 script woco BNG 2022.ipynb	Klantgroepen\Woningcorporaties\SDG 13.2 – CO2 emissies\PCAF data\Notebooks
20231110_pBNG.vWOCO_2020_IndividueleKlanen.xlsx 20231110_pBNG.vWOCO_2021_IndividueleKlanen.xlsx 20231110_pBNG.vWOCO_2022_IndividueleKlanen.xlsx	Klantgroepen\Woningcorporaties\SDG 13.2 – CO2 emissies

4.2.6 Development costs - livability, maintenance, and improvements

Topic	Description
Data	Development costs social housing associations. This includes the costs incurred for livability, maintenance, and improvement expenditures.
Calculation steps	Expenditures on livability, maintenance, and improvement are added together, forming the investment in development per housing association
Limitations	No limitations
SDG	SDG 11.1: Sustainable cities and communities
Data quality estimate	All the data is primary data which is obtained directly from the social housing associations. No calculations or estimations needed; data is non-audited. Data quality score = 2

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Development costs on livability, maintenance, and improvements
Data file	23114_Uitgaven leefbaarheid – onderhoud – verbeteringen.xlsx

Data Source	Inspectie Leefomgeving en Transport (Rijk)
Year	2019, 2020 & 2021
Last update	10-11-2022 04-07-2022
Date of download	26-10-2023
Link to webpage	https://data.overheid.nl/en/dataset/verantwoordingsinformatie-woningcorporaties-dvi2021-hfd3 https://data.overheid.nl/en/dataset/verantwoordingsinformatie-woningcorporaties-dvi2020-hfd3
Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Woningcorporaties\SDG 11.1 Ontwikkelkosten woningcorporaties
Data quality estimate	2
Unit of measurement	Euros
Selections	Not applicable
Data transformation	Not applicable
Data missing	Not applicable
Print Screens	Klantgroepen\Woningcorporaties\SDG 11.1 Ontwikkelkosten woningcorporaties\Printscreens

5 Educational institutions

5.1 General factsheet

Topic	Description
Portfolio covered	76.8% of BNG bank's portfolio is covered for this costumer group. 34% of the clients is a non-authorized educational institution. The percentage is an indication of the completeness of the dataset. It is calculated by looking at the collected data for all indicators for the clients in the loan portfolio of the BNG Bank. The percentage is lower than 100% if there are missing data. The missing data are either not available, or it was not possible to collect or calculate these data correctly.
Indicators	- Energy consumption educational buildings – electricity (kWh); - Energy consumption educational buildings – natural gas (m^3); - GHG emissions per educational institution; - Investments in school buildings and grounds.
Limitations	- Some clients have a score of zero in the 0-measurement and for the 1-measurement a score that is higher than zero. In these cases, the formula (of percentage increase/decrease) does not work, because a division by zero is not possible. This results in zero impact, while there definitely is impact. These cases got a difference of 100 percent, and this percentage is used for the following calculation steps. In the calculation sheets, these adjustments are colored. For the indicator 'investments in school buildings' this was the case for 2 educational institutions. - The coverage rate of the education sector is relatively low. This is due to a high percentage of clients who are officially no educational institution. In the Netherlands all educational institutions have an authorized number. For the total client group 34% is a non-authorized educational institution.

5.2 Factsheet per data source used per indicator

5.2.1 Energy consumption educational buildings – electricity (kWh) and natural gas (m^3)

Topic	Description
Data	Energy consumption for buildings owned by educational institutions, divided in electricity use (in kWh) and natural gas use (in m^3). Data on the electricity use and natural gas use is based on connection registers of energy network companies. Due to privacy regulations, it is not possible to collect this data for individual buildings. The data is therefore collected for small clusters of similar buildings. The data has been aggregated to the level of educational institution. Where no actual data usage was available, the data has been replaced by estimated values.
Calculation steps	The following steps has been performed by Republiq: 1. Inventory of buildings owned by educational institutions; 2. Request to network operators; 3. Processing consumption data; 4. Estimate missing consumption data; *1. Inventory of buildings owned by educational institutions* Republiq has made a list of all buildings that are owned by the educational institutions that are client at BNG Bank. To make this list for primary and secondary schools, Republiq made use of sources of DUO (Dienst

	Uitvoering Onderwijs). For some missing primary and secondary schools and for higher education, Republiq has manually looked up which buildings are used by the educational institutions or Republiq has obtained these data from Kadaster. *2. Request to network operators* Due to privacy reasons, it is not allowed to provide consumption data for individual buildings. It is allowed to provide these for clusters of buildings (10 to 15 buildings). Republiq therefore has made clusters of the buildings, taking into account the owner of the buildings and the type of building. Where possible, clusters consist only of buildings of the same owner. If this is not possible, buildings of different owners have been merged into a cluster. Clusters are made as followed: a. The network operator has been assigned to the buildings. This has been done on the basis of address details and the area division of the operators (see: https://data.overheid.nl/dataset/gebiedsbedrijven-netbeheers-elektriciteit--gas-en-water). Republiq has only requested consumption data from the three largest network operators (Enexis, Liander and Stedin). These operators provide approximately 95% of the buildings with energy. For buildings that fall in an area of another operator Republiq has estimated the consumption. b. The request for energy consumption data at the three operators is at the level of unique addresses. Republiq has therefore grouped the data by zip code, house number and house number addition. The number of unique addresses has been counted per education institution. c. Republiq has made clusters of at least 15 addresses. Where possible, Republiq has created multiple clusters per institution. d. Republiq has created joint clusters for institutions with fewer than 15 unique addresses and has calculated the average surface area of the buildings per institution. Then clusters have been created of at least 15 buildings, in which the buildings of institutions with a comparable surface area ended up in the same cluster. *3. Processing consumption data* From the network operators Republiq has received per cluster the standard annual consumption (in Dutch: standaard jaarverbruik (SJV)[30]). Republiq has divided this by the average surface of buildings from a cluster to obtain consumption data per m^2. The consumption data per m^2 has been assigned to the individual buildings belonging to a cluster. Next, Republiq has performed a check on outliers. When the electricity consumption of an establishment was higher than 200 kWh per m^2, Republiq has marked this as unreliable and has replaced this value with an estimated value. When the natural gas consumption of an establishment was higher than 100 m^3 per m^2, Republiq has marked this as unreliable and has replaced this value with an estimated value. *4. Estimate missing consumption data* For buildings without actual energy consumption data Republiq has made use of estimated values of electricity use and natural gas use. These estimated values have been based on actual values for electricity and gas usage for the years 2018 and 2020 and are estimated for the years 2021 and

[30] 'Standaard jaarverbruik' 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 gaspressure.

	2022 according to the development in energy consumption based on trends published by CBS. *Overview per educational institution* For each educational institution Republiq has grouped the following measures: - Total electricity consumption (in kWh) - Total gas consumption (in Nm^3)
Limitations	It is not possible to assign actual consumption data to every building. For the buildings where this is not possible, Republiq has made an estimation of the consumption data. Consumption data has only been collected from the three largest network operators. Due to privacy regulations, it is not possible to collect energy data for individual institutions. The data has therefore been collected for small clusters of institutions. For energy consumption the standard annual consumption (in Dutch 'standaard jaarverbruik' (SJV)[31]) has been used. 'Standaard jaarverbruik' 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 gaspressure. Therefore, this energy consumption can differ from the actual energy consumption.
SDG	SDG 7.3
Data quality estimate	3 Part of the data is based on energy consumption data delivered by the three largest energy operators in the Netherlands for clusters of buildings, but when these data has not been available estimated values have been used based on sector specific data, therefore data quality score is 3.

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Energy consumption (Enexis)
Data file	Energierapport Republiq - 20230918.xlsx
Data Source	Enexis
Year	2020, 2021 & 2022
Last update	18-9-2023
Date of download	18-9-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	2
Unit of measurement	kWh for electricity and Nm^3 for natural gas

[31] 'Standaard jaarverbruik' 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 gaspressure.

Selections	Not applicable
Data transformation	Not applicable
Data missing	For some clusters Republiq did not receive energy consumption data. This can have several causes: - Enexis could not find an address (this is most often the case for addresses with an add-on. For example, house number 1-A); - The address is assigned to a connection for large consumption (grootverbruik). Net operators are not allowed to share this data.
Print Screens	Not applicable

Topic	Description
Data	Energy consumption (Liander)
Data file	Oplevering AL-24540997.xlsx
Data Source	Liander
Year	2020, 2021 & 2022
Last update	20-9-2023
Date of download	20-9-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	2
Unit of measurement	kWh for electricity and Nm^3 for natural gas
Selections	Not applicable
Data transformation	Not applicable
Data missing	For some clusters Republiq did not receive energy consumption data. This can have several causes: - Liander could not find an address (this is most often the case for addresses with an add-on. For example, house number 1-A); - The address is assigned to a connection for large consumption (grootverbruik). Net operators are not allowed to share this data.
Print Screens	Not applicable

Topic	Description
Data	Energy consumption (Stedin)
Data file	Republiq1-8.xlsx
Data Source	Stedin
Year	2020, 2021 & 2022
Last update	13-9-2023
Date of download	13-9-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	2
Unit of measurement	kWh for electricity and Nm^3 for natural gas
Selections	Not applicable
Data transformation	Not applicable
Data missing	For some clusters Republiq did not receive energy consumption data. This can have several causes: - Stedin could not find an address (this is most often the case for addresses with an add-on. For example, house number 1-A);

	- The address is assigned to a connection for large consumption (grootverbruik). Net operators are not allowed to share this data.
Print Screens	Not applicable

Topic	Description
Data	Electricity use (kWh) and natural gas use (Nm^3) per education institution
Data file	Original file: 20231009 - BNG_energieverbruik_onderwijs.xlsx Edited files: 231012 nulmeting eenmeting tweemeting elektriciteitsverbruik onderwijsinstellingen.xlsx 231012 nulmeting eenmeting tweemeting gasverbruik onderwijsinstellingen.xlsx
Data Source	Republiq
Year	2020, 2021 & 2022
Last update	Not applicable
Date of download	Received by MSafe 11-10-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	From original file only column woningcorporatie, kvk, elektra, and gas has been selected.
Internal location	Original file: Klantgroepen\Onderwijsinstellingen\SDG_7.3_Elektriciteitsverbruik onderwijsinstellingen\Ruwe data Klantgroepen\Onderwijsinstellingen\SDG_7.3_Gasverbruik onderwijsinstellingen\Ruwe data Edited files: Klantgroepen\Onderwijsinstellingen\SDG_7.3_Elektriciteitsverbruik onderwijsinstellingen Klantgroepen\Onderwijsinstellingen\SDG_7.3_Gasverbruik onderwijsinstellingen
Data quality	3 Part of the data is based on energy consumption data delivered by the three largest energy operators in the Netherlands for clusters of buildings, but when these data has not been available estimated values have been used based on sector specific data, therefore data quality score is 3.
Unit of measurement	kWh for electricity and Nm^3 for natural gas
Selections	Not applicable
Data transformation	Not applicable
Data missing	Energy consumption data is only available for houses located in the areas of the three largest network operators (Enexis, Stedin, and Liander).
Print Screens	Klantgroepen\Onderwijsinstellingen\SDG_7.3_Elektriciteitsverbruik onderwijsinstellingen\Printscreens Klantgroepen\Onderwijsinstellingen\SDG_7.3_Gasverbruik onderwijsinstellingen\Printscreens

5.2.2 GHG emissions per educational institution

Topic	Description
Data	Energy consumption data from educational institutions are obtained from three largest network operators in the Netherlands (Enexis, Liander and Stedin).
Calculation steps	The following steps has been performed by Republiq: 1. Inventory of buildings owned by educational institutions; 2. Request to network operators;

3. Processing consumption data;
4. Estimate missing consumption data;

1. *Inventory of buildings owned by educational institutions*

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

2. *Request to network operators*

Due to privacy reasons it is not allowed to provide consumption data for individual buildings. It is allowed to provide these for clusters of buildings (10 to 15 buildings). Republiq therefore has made clusters of the buildings, taking into account the owner of the buildings and the type of building. Where possible, clusters consist only of buildings of the same owner. If this is not possible, buildings of different owners have been merged into a cluster.

Clusters are made as followed:

a. The network operator has been assigned to the buildings. This has been done on the basis of address details and the area division of the operators (see: https://data.overheid.nl/dataset/gebiedsbedrijven-netbeheers-elektriciteit--gas-en-water). Republiq has only requested consumption data from the three largest network operators (Enexis, Liander and Stedin). These operators provide approximately 95% of the buildings with energy. For buildings that fall in an area of another operator Republiq has estimated the consumption.
b. The request for energy consumption data at the three operators is at the level of unique addresses. Republiq has therefore grouped the data by zip code, house number and house number addition. The number of unique addresses has been counted per education institution.
c. Republiq has made clusters of at least 15 addresses. Where possible, Republiq has created multiple clusters per institution.
d. Republiq has created joint clusters for institutions with fewer than 15 unique addresses and has calculated the average surface area of the buildings per institution. Then clusters has been created of at least 15 buildings, in which the buildings of institutions with a comparable surface area ended up in the same cluster.

3. *Processing consumption data*

From the network operators Republiq has received per cluster the standard annual consumption (in Dutch: standaard jaarverbruik (SJV)[32]). Republiq has divided this by the average surface of buildings from a cluster to obtain consumption data per m^2. The consumption data per m^2 has been assigned to the individual buildings belonging to a cluster.
Next, Republiq has performed a check on outliers. When the electricity consumption of an establishment was higher than 200 kWh per m^2, Republiq has marked this as unreliable and has replaced this value with an estimated value. When the natural gas consumption of an establishment was higher than 100 m^3 per m^2, Republiq has marked this as unreliable and has replaced this value with an estimated value.

[32] 'Standaard jaarverbruik' 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 gaspressure.

	4. Estimate missing consumption data For buildings without actual energy consumption data Republiq has made use of estimated values of electricity use and natural gas use. These estimated values have been based on actual values for electricity and gas usage for the years 2018 and 2020 and are estimated for the years 2021 and 2022 according to the development in energy consumption based on trends published by CBS. *Overview per educational institution* For each educational institution Republiq has grouped the following measures: - Total electricity consumption (in kWh) - Total gas consumption (in Nm^3) The total energy consumption per educational institution has been converted into kg GHG emissions using the emission factor for electricity from unknown sources and natural gas use. These GHG emissions in kg have been divided by 1000 to result in GHG emissions in ton. The following emission factors have been used: - Electricity unknown source: 0.405 kg CO_2-eq /kWh (2020 and 2021) and 0.369 kg CO_2-eq /kWh (2022); - Natural gas: 1.785 kg CO_2-eq /Nm^3 (2020 and 2021) and 1.788 kg CO_2-eq /Nm^3 (2022). The emission factors can be found in the folder: Klantgroepen, file: 20230717 emissiefactoren met bron.xlsx
Limitations	It is not possible to assign actual consumption data to every building. For the buildings where this is not possible, Republiq has made an estimation of the consumption data. Consumption data has only been collected from the three largest network operators. For health care institutions operating solely outside the regions where these operators are active, there is no data available. Due to privacy regulations, it is not possible to collect energy data for individual institutions. The data has therefore been collected for small clusters of institutions. For energy consumption the standard annual consumption (in Dutch 'standaard jaarverbruik' (SJV)[33]) has been used. 'Standaard jaarverbruik' 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 gaspressure. Therefore, this energy consumption can differ from the actual energy consumption. Some primary school buildings are in possession of municipalities. It might be possible that for some primary school buildings the energy consumption is included in the GHG emissions of Municipalities and also in the education institutions.
SDG	SDG 13.2
Data quality estimate	3 Part of the data is based on energy consumption data delivered by the three largest energy operators in the Netherlands for clusters of buildings, but when these data has not been available estimated values have been used based on sector specific data, therefore data quality score is 3.

[33] 'Standaard jaarverbruik' 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 gaspressure.

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Energy consumption (Enexis)
Data file	Energierapport Republiq – 20230918.xlsx
Data Source	Enexis
Year	2020, 2021 & 2022
Last update	18-9-2023
Date of download	18-9-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	2
Unit of measurement	kWh for electricity and Nm^3 for natural gas
Selections	Not applicable
Data transformation	Not applicable
Data missing	For some clusters Republiq did not receive energy consumption data. This can have several causes: - Enexis could not find an address (this is most often the case for addresses with an add-on. For example, house number 1-A); - The address is assigned to a connection for large consumption (grootverbruik). Net operators are not allowed to share this data.
Print Screens	Not applicable

Topic	Description
Data	Energy consumption (Liander)
Data file	Oplevering AL-24540997.xlsx
Data Source	Liander
Year	2020, 2021 & 2022
Last update	20-9-2023
Date of download	20-9-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	2
Unit of measurement	kWh for electricity and Nm^3 for natural gas
Selections	Not applicable
Data transformation	Not applicable
Data missing	For some clusters Republiq did not receive energy consumption data. This can have several causes:

	- Liander could not find an address (this is most often the case for addresses with an add-on. For example, house number 1-A); - The address is assigned to a connection for large consumption (grootverbruik). Net operators are not allowed to share this data.
Print Screens	Not applicable

Topic	Description
Data	Energy consumption (Stedin)
Data file	Republiq1-8.xlsx
Data Source	Stedin
Year	2020, 2021 & 2022
Last update	13-9-2023
Date of download	13-9-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	2
Unit of measurement	kWh for electricity and Nm^3 for natural gas
Selections	Not applicable
Data transformation	Not applicable
Data missing	For some clusters Republiq did not receive energy consumption data. This can have several causes: - Stedin could not find an address (this is most often the case for addresses with an add-on. For example, house number 1-A); - The address is assigned to a connection for large consumption (grootverbruik). Net operators are not allowed to share this data.
Print Screens	Not applicable

Topic	Description
Data	Electricity use (kWh) and natural gas use (Nm^3) per education institution
Data file	Original file : 20231009 – BNG_energieverbruik_onderwijs.xlsx
Data Source	Republiq
Year	2020, 2021 & 2022
Last update	Not applicable
Date of download	Received by Msafe 11-10-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	From original file only column woningcorporatie, kvk, 75tandar, and gas has been selected.
Internal location	Klantgroepen\Onderwijsinstellingen\SDG 13.2_CO2-emissies onderwijsinstellingen\PCAF data
Data quality	3 Part of the data is based on energy consumption data delivered by the three largest energy operators in the Netherlands for clusters of buildings, but when these data has not been available estimated values have been used based on sector specific data, therefore data quality score is 3.
Unit of measurement	kWh for electricity and Nm^3 for natural gas
Selections	Not applicable
Data transformation	Not applicable

Data missing	Energy consumption data is only available for houses located in the areas of the three largest network operators (Enexis, Stedin, and Liander).
Print Screens	Klantgroepen\Onderwijsinstellingen\SDG 13.2_CO2-emissies onderwijsinstellingen\PCAF data

List of the calculation sheets	Location
231018_Energieverbruik BNG Bank.csv 231018_Leningportefeuille BNG Bank.csv 231208_Passiva BNG Bank.csv Emissiefactoren.csv	Klantgroepen\Onderwijsinstellingen\SDG 13.2_CO2-emissies onderwijsinstellingen\PCAF data\Brondata voor SQL
CO2-emissie onderwijs 2020.sql CO2-emissie onderwijs 2021.sql CO2-emissie onderwijs 2021.sql	Klantgroepen\Onderwijsinstellingen\SDG 13.2_CO2-emissies onderwijsinstellingen\SQL scripts
240207 CO2-emissie onderwijsinstellingen.xlsx	Klantgroepen\Onderwijsinstellingen\SDG 13.2_CO2-emissies onderwijsinstellingen

5.2.3 Investments in school buildings and grounds

Topic	Description
Data	Investments in school buildings and grounds.
Calculation steps	No calculations were performed on the original data set. The data is delivered by school boards via their yearly financial statements supplied in XBRL. Complemented with the yearly financial statements of 2017 to 2022. The data are not audited by an accountant, The Ministry of Education or DUO. But are audited by the institutions.
Limitations	No limitations
SDG	SDG 4: Quality education
Data quality estimate	2 – Non-audited data, or other primary data. The data is delivered by school boards via their yearly financial statements. These financial statements are audited by an accountant, but the data is not audited by DUO or the Ministry of Education, where the used dataset comes from.

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Investments in school buildings and grounds
Data file	230920_Bronbestand 05.-materiale-vaste-activa-2018-2022.xlsx 20230920_Investeringen gebouwen en terreinen onderwijs.xlsx
Data Source	Dienst Uitvoering Onderwijs (DUO)
Years	2020, 2021 & 2022
Last update	19-09-2023
Date of download	20-09-2023
Link to webpage	https://duo.nl/open_onderwijsdata/onderwijs-algemeen/financiele-overzichten/financiele-verantwoording-xbrl.jsp
Filters used to obtain the datafile	No filters used

Internal location	Klantgroepen\Onderwijsinstellingen\SDG 4_Investeringen gebouwen
Data quality estimate	2 – Non-audited data, or other primary data. Data comes from the 2020 financial statements of the school board. Data is not audited by an accountant or by the ministry of Education, Culture and Science or DUO.
Unit of measurement	Euros
Selections	No selections
Data missing	Not applicable
Print Screens	Klantgroepen\Onderwijsinstellingen\SDG 4_Investeringen in onderwijsgebouwen en terreinen\Printscreens

6 Healthcare institutions

6.1 General factsheet

Topic	Description
Portfolio covered	94.6% of BNG bank's portfolio is covered for this sector. The percentage is an indication of the completeness of the dataset. It is calculated by looking at the collected data for all indicators for the clients in the loan portfolio of the BNG Bank. The percentage is lower than 100% if there are missing data. The missing data are either not available, or it was not possible to collect or calculate these data correctly.
Indicators	- Energy consumption for healthcare institutions – electricity (kWh); - Energy consumption for healthcare institutions – natural gas (m3); - GHG emissions per healthcare institution.
Limitations	-

6.2 Factsheet per data source used per indicator

6.2.1 Energy consumption healthcare institutions – electricity (kWh) and natural gas (m^3)

Topic	Description
Data	Energy consumption data from healthcare institutions are obtained from three largest network operators in the Netherlands (Enexis, Liander and Stedin).
Calculation steps	Energy consumption data was received from three largest network operators in the Netherlands based on cadastral parcels owned by healthcare institutions. The following steps has been performed by Republiq: 1. Inventory of buildings owned by healthcare institutions 2. Request to network operators 3. Processing consumption data 4. Estimate missing consumption data 5. Joining energy class 6. Create output file 1. *Inventory of buildings owned by healthcare institutions* BNG Bank has provided an overview of healthcare institutions from their portfolio. For these institutions Republiq has inventoried the properties of the healthcare institutions via Kadaster. 2. *Request to network operators* Due to privacy reasons it is not allowed to provide consumption data for individual buildings. It is allowed to provide these for clusters of buildings (10 to 15 buildings). Republiq has therefore made clusters of the buildings, taking into account the owner of the buildings and the type of building. Where possible, clusters consist only of buildings of the same owner. If this is not possible,78tandardgs of different owners have been merged into a cluster. Clusters are made as followed: a. The network operator has been assigned to the buildings. This has been done on the basis of address details and the area division of the operators (see: https://data.overheid.nl/dataset/gebiedsbedrijven-netbeheers-elektriciteit--gas-en-water). Republiq has only requested consumption data from the three largest network operators (Enexis,

	Liander and Stedin). Together they provide approximately 95% of the buildings with energy. For buildings that fall in an area of another operator Republiq has made an estimate of the energy consumption. b. The request for data has been done at the level of unique addresses. Republiq has therefore grouped the data by zip code, house number and house number addition. The number of unique addresses has been counted per institution. c. Republiq has made clusters of at least 15 addresses. Where possible, Republiq has created multiple clusters per institution. d. Republiq has created joint clusters for institutions with fewer than 15 unique addresses and calculated the average surface area of the buildings per institution. Republiq has then created clusters of at least 15 buildings, in which the buildings of institutions with a comparable surface area ended up in the same cluster. 3. *Processing consumption data* From the network operators Republiq has received per cluster the standard annual consumption (in Dutch 79tandard jaarverbruik (SJV)[34]). Republiq has divided this by the average surface of buildings from a cluster to obtain consumption data per m^2. The consumption data per m^2 has been assigned to the individual buildings belonging to a cluster. Next, Republiq has performed a check on outliers. When the electricity consumption of an establishment was higher than 200 kWh per m^2, it has been marked as unreliable and has been replaced by an estimated value. When the natural gas consumption of an establishment was higher than 100 m^3 per m^2, it has been marked as unreliable and has been replaced by an estimated value. 4. *Estimate missing consumption data* For buildings without actual energy consumption data Republiq has made use of estimated values of electricity use and natural gas use. These estimated values have been based on actual values for electricity and gas usage for the years 2018 and 2020 and are estimated for the years 2021 and 2022 according to the development in energy consumption based on trends published by CBS. *Overview per healthcare institution* For each healthcare institution Republiq has grouped the following measures: - Total electricity consumption (in kWh) - Total gas consumption (in Nm^3)
Limitations	It is not possible to assign actual consumption data to every building. For the buildings where this is not possible, Republiq has made an estimation of the consumption data. Consumption data has only been collected from the three largest network operators. For healthcare institutions operating solely outside the regions where these operators are active, there is no data available. Due to privacy regulations, it is not possible to collect energy data for individual institutions. The data has therefore been collected for small clusters of institutions. For energy consumption the standard annual consumption (in Dutch 'standaard jaarverbruik' (SJV)[35]) has been used. 'Standaard jaarverbruik' is the actual energy consumption recalculated to the expected energy consumption in a standard

[34] 'Standaard jaarverbruik' 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 gaspressure.

[35] 'Standaard jaarverbruik' 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 gaspressure.

	year. The actual energy consumption is corrected for a warmer or colder year, energy per m^3, and the gas pressure. Therefore, this energy consumption can differ from the actual energy consumption.
SDG	SDG 7.3
Data quality estimate	3 The electricity consumption is based as much as possible on actual building energy consumption. However, due to privacy reasons it is not allowed to provide energy consumption data for individual buildings. It is allowed to provide these for cluster of buildings (10 to 15 buildings). Where possible, clusters consisted only of buildings of the same owner. If this was not possible, buildings of different owners have been clustered. For the buildings with missing consumption data an estimation for gas and electricity has been assigned on the basis of the building period and surface class. Because the actual building energy consumption had to be clustered and in some cases for the buildings with missing data an estimation was made the data quality score is 3.

Score	Quality requirement
1	Audited data or actual primary data
2	Non-audited data, or other primary data
3	Average data that is peer/(sub)sector-specific
4	Proxy data on the basis of region or country
5	Estimated data with very limited support

Topic	Description
Data	Cadastral parcels in ownership of healthcare institutions
Data files	UITVOER_ZORG_KVK_REPUBLIQ_20211101.xlsx
Data Source	Kadaster
Year	2021
Last update	09-12-2021
Date of download	09-12-2021
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	2
Unit of measurement	Not applicable
Selections	Not applicable
Data transformation	Not applicable
Data missing	Not applicable
Print screens	Not applicable

Topic	Description
Data	Energy consumption (Enexis)
Data files	Energierapport Republiq – 20230918.xlsx
Data Source	Enexis
Year	2020, 2021 & 2022
Last update	18-9-2023
Date of download	18-9-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq

Data quality	2
Unit of measurement	kWh for electricity and m^3 for natural gas
Selections	Not applicable
Data transformation	Not applicable
Data missing	For some clusters Republiq did not receive energy consumption data. This can have several causes: - Enexis could not find an address (this is most often the case for addresses with an add-on. For example, house number 1-A) - The address is assigned to a connection for large consumption (grootverbruik). Net operators are not allowed to share this data.
Print Screens	Not applicable

Topic	Description
Data	Energy consumption (Liander)
Data files	Oplevering AL-24540997.xlsx
Data Source	Liander
Year	2020, 2021 & 2022
Last update	20-9-2023
Date of download	20-9-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	2
Unit of measurement	kWh for electricity and m^3 for natural gas
Selections	Not applicable
Data transformation	Not applicable
Data missing	For some clusters Republiq did not receive energy consumption data. This can have several causes: - Liander could not find an address (this is most often the case for addresses with an add-on. For example, house number 1-A) - The address is assigned to a connection for large consumption (grootverbruik). Net operators are not allowed to share this data.
Print Screens	Not applicable

Topic	Description
Data	Energy consumption (Stedin)
Data files	Republiq1-8.xlsx
Data Source	Stedin
Year	2020, 2021 & 2022
Last update	13-9-2023
Date of download	13-9-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	2
Unit of measurement	kWh for electricity and m^3 for natural gas
Selections	Not applicable
Data transformation	Not applicable

Data missing	For some clusters Republiq did not receive energy consumption data. This can have several causes: - Stedin could not find an address (this is most often the case for addresses with an add-on. For example, house number 1-A) - The address is assigned to a connection for large consumption (grootverbruik). Net operators are not allowed to share this data.
Print Screens	Not applicable

Topic	Description
Data	Electricity use (kWh) and natural gas use (Nm^3) per healthcare institution
Data file	Original files : 4 files of 4 healthcare institutions 20231101 – BNG_energieverbruik_zorg.xlsx Edited files : Energiedata BNG Bank.csv 231208 Aanvulling zorginstellingen vanuit data vorig jaar BNG Bank.xlsx 231208_Energieverbruik BNG Bank_missende zorginstellingen aangevuld.xlsx
Data Source	Republiq
Year	2020, 2021 & 2022
Last update	Not applicable
Date of download	Received by Msafe 11-10-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	From original file only column woningcorporatie, kvk, 82tandar, and gas has been selected.
Internal location	Original files: Klantgroepen\Zorgsector\SDG_7.3_aardgasverbruik zorginstellingen\Ruwe data Klantgroepen\Zorgsector\SDG_7.3_elektriciteitsverbruik zorginstellingen\Ruwe data Edited files: Klantgroepen\Zorgsector\SDG_7.3_elektriciteitsverbruik zorginstellingen\Voorbewerking data Klantgroepen\Zorgsector\SDG_7.3_aardgasverbruik zorginstellingen\Voorbewerking data
Data quality	3 Part of the data is based on energy consumption data delivered by the three largest energy operators in the Netherlands for clusters of buildings, but when these data has not been available estimated values have been used based on sector specific data, therefore data quality score is 3.
Unit of measurement	kWh for electricity and Nm^3 for natural gas
Selections	Not applicable
Data transformation	Not applicable
Data missing	Energy consumption data is only available for houses located in the areas of the three largest network operators (Enexis, Stedin, and Liander).
Print Screens	Klantgroepen\Zorgsector\SDG_7.3_aardgasverbruik zorginstellingen\Printscreens Klantgroepen\Zorgsector\SDG_7.3_elektriciteitsverbruik zorginstellingen\Printscreens

List of the calculation sheets	Location
231213 nulmeting eenmeting tweemeting elektriciteitsverbruik zorginstellingen.xlsx	Klantgroepen\Zorgsector\SDG_7.3_elektriciteitsverbruik zorginstellingen
231213 nulmeting eenmeting tweemeting aardgasverbruik zorginstellingen.xlsx	Klantgroepen\Zorgsector\SDG_7.3_aardgasverbruik zorginstellingen

6.2.2 GHG emissions per healthcare institution

Topic	Description
Data	Energy consumption data from healthcare institutions are obtained from three largest network operators in the Netherlands (Enexis, Liander and Stedin). Geographically based annual averages (provinces/NUTS2) for commuting distance data is coming from the Dutch Central Bureau of Statistics (CBS). Just as the Geographically based annual averages (provinces/NUTS2) for business travel distance and distance travelled per means of transportation data.
Calculation steps	**Scope 1 & Scope 2** Scope 1 emissions are the direct GHG emissions of the organizations. For healthcare institutions, these emissions result from the use of natural gas for heating of buildings, or for disinfection of medical tools. 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. Because steam, heating or cooling use per healthcare institution is unknown, scope 2 will only be based on the emissions from purchased electricity. Energy consumption data was received from three largest network operators in the Netherlands based on cadastral parcels owned by healthcare institutions. The following steps has been performed by Republiq: 1. Inventory of buildings owned by healthcare institutions 2. Request to network operators 3. Processing consumption data 4. Estimate missing consumption data 5. Joining energy class 6. Create output file 1. *Inventory of buildings owned by healthcare institutions* BNG Bank has provided an overview of healthcare institutions from their portfolio. For these institutions Republiq has inventoried the properties of the healthcare institutions via Kadaster. 2. *Request to network operators* Due to privacy reasons, it is not allowed to provide consumption data for individual buildings. It is allowed to provide these for clusters of buildings (10 to 15 buildings). Republiq has therefore made clusters of the buildings, taking into account the owner of the buildings and the type of building. Where possible, clusters consist only of buildings of the same owner. If this is not possible,83tandardgs of different owners have been merged into a cluster. Clusters are made as followed: a. The network operator has been assigned to the buildings. This has been done on the basis of address details and the area division of the operators (see: https://data.overheid.nl/dataset/gebiedsbedrijven-netbeheers-elektriciteit--gas-en-water). Republiq has only requested consumption data from the three largest network operators (Enexis, Liander and Stedin). Together they provide approximately 95% of the buildings with energy. For buildings that fall in an area of another operator Republiq has made an estimate of the energy consumption. b. The request for data has been done at the level of unique addresses. Republiq has therefore grouped the data by zip code, house number and house number addition. The number of unique addresses has been counted per institution.

c. Republiq has made clusters of at least 15 addresses. Where possible, Republiq has created multiple clusters per institution.
d. Republiq has created joint clusters for institutions with fewer than 15 unique addresses and calculated the average surface area of the buildings per institution. Republiq has then created clusters of at least 15 buildings, in which the buildings of institutions with a comparable surface area ended up in the same cluster.

1. *Processing consumption data*

From the network operators Republiq has received per cluster the standard annual consumption (in Dutch 84tandard jaarverbruik (SJV)[36]). Republiq has divided this by the average surface of buildings from a cluster to obtain consumption data per m^2. The consumption data per m^2 has been assigned to the individual buildings belonging to a cluster.
Next, Republiq has performed a check on outliers. When the electricity consumption of an establishment was higher than 200 kWh per m^2, it has been marked as unreliable and has been replaced by an estimated value. When the natural gas consumption of an establishment was higher than 100 m^3 per m^2, it has been marked as unreliable and has been replaced by an estimated value.

2. *Estimate missing consumption data*

For buildings without actual energy consumption data Republiq has made use of estimated values of electricity use and natural gas use. These estimated values have been based on actual values for electricity and gas usage for the years 2018 and 2020 and are estimated for the years 2021 and 2022 according to the development in energy consumption based on trends published by CBS.

Overview per healthcare institution

For each healthcare institution Republiq has grouped the following measures:

- Total electricity consumption (in kWh)
- Total gas consumption (in Nm^3)

The total energy consumption per healthcare institution has been converted into kg GHG emissions using the emission factor for electricity from unknown sources and natural gas use. These GHG emissions in kg have been divided by 1000 to result in GHG emissions in ton.

The following emission factors have been used:

- Electricity unknown source: 0.405 kg CO_2-eq /kWh (2020 and 2021) and 0.369 kg CO_2-eq /kWh (2022);
- Natural gas: 1.785 kg CO_2-eq /Nm^3 (2020 and 2021) and 1.788 kg CO_2-eq /Nm^3 (2022).

Scope 3

Scope 3 should cover all other indirect emissions (not included in Scope 2). In this report, scope 3 is incomplete and only emissions from employee commuting have been included in the calculations.

From the datasets of the Ministry of Health, Welfare and Sport available for 2022 the number of employees in fulltime equivalent (FTE) were used for the calculations.

According to the average distance a person travels per year by bus/tram/metro, train, bike, car as driver, car as passenger, foot, and other mode of transport (7 travel types), the percentage of travelling per travel type has been calculated.

The average distance a person travels per year is available at province level (CBS Statline). The average distance a person travels per year from and to work and for

[36] 'Standaard jaarverbruik' 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 gaspressure.

	business is assigned to the healthcare institution based on the province in which the institution is located. For every type of transport (except for other mode of transport), the number of employees in FTE has been multiplied by the average distance a person travels per year for work and by percentage of transport type to calculate the number of kilometer travelled per year with the travel types (except for other mode of transport). Afterwards, the kilometers per year per travel type has been multiplied by the corresponding emission factor resulting in kilogram GHG emissions for each travel type. For car as driver and car as passenger the total kilometer travelled per year has been first divided by 1.39 (Conversion factor for travel kilometers to vehicle kilometers (the average occupancy rate of cars is 1.39 per car; CO2emissiefactoren.nl, 2022) and then this has been multiplied by the corresponding emission factor resulting in kilogram GHG emissions. The kilogram GHG emissions for each travel type has been added up to result in scope 3. These GHG emissions in kg have been divided by 1000 to result in GHG emissions in ton. The following emission factors have been used: - Bus /Tram/Metro: 0.052 kg CO_2-eq / passenger kilometer (2020, 2021 and 2022); - Train (unknown type): 0.005 kg CO_2-eq / passenger kilometer (2020) and 0.002 kg CO_2-eq / passenger kilometer (2021 and 2022); - Car (average type, weight class medium heavy, fuel mix 79.3% petrol, 15.8% diesel, 1.5% lpg, 3.0% petrol-hybrid, 0.2% electric): 0.163 kg CO_2-eq / vehicle kilometer (2020 and 2021) and car (average type, weight class medium heavy, fuel mix 80.3% petrol, 12.3% diesel, 1.3% lpg, 0.1% petrol-hybrid, 6% electric): 0.145 kg CO_2-eq / vehicle kilometer (2022). The emission factors can be found in the folder: Klantgroepen, file: 20230717 emissiefactoren met bron.xlsx
Limitations	Several healthcare institutions from the loan portfolio are not included in the calculations of scopes 1, 2, and 3 because there is no information available regarding their total balance sheet. **Scope 1 & scope 2** It is not possible to assign actual consumption data to every building. For the buildings where this is not possible, Republiq has made an estimation of the consumption data. Consumption data has only been collected from the three largest network operators. For health care institutions operating solely outside the regions where these operators are active, there is no data available. Due to privacy regulations, it is not possible to collect energy data for individual institutions. The data has therefore been collected for small clusters of institutions. For energy consumption the standard annual consumption (in Dutch 'standaard jaarverbruik' (SJV)[37]) has been used. 'Standaard jaarverbruik' 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 per m^3, and the gas pressure. Therefore, this energy consumption can differ from the actual energy consumption.

[37] 'Standaard jaarverbruik' 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 gaspressure.

	For electricity the emission factor Electricity (unknown source) has been used. It is unknown whether a healthcare institution purchases green energy from the Netherlands. For that reason, this emission factor is used. Due to more awareness about the importance of sustainable energy, the purchase of green energy from the Netherlands might increase. In that case the GHG emissions due to electricity use is overestimated by using the emission factor Electricity (unknown source). Ideally, emissions from other sources in the primary process of healthcare institutions should be taken into account as well. For example, emissions of other gasses from ambulances and trauma helicopters used for medical procedures. Unfortunately, the data provided on these issues is insufficient to be able to make reliable estimations. Therefore, only natural gas use is taken into consideration under scope 1. **Scope 3** Scope 3 should cover all other indirect emissions (not included in Scope 2). Only a small part of scope 3 is covered for the healthcare institutions. The part that is covered is based on proxy data and therefore data quality is poor. In the calculation of scope 3, the number of employees (in FTE) has a major impact on the results. The used mobility data from CBS is based on people that work 30 hours per week or more. It was not possible to choose a working week of 40 hours. So this selection of people is larger than the group of people that works between 36 and 40 hours per week (1 FTE). These mentioned factors have an effect on the data quality. Finally, there are several healthcare institutions for which only scope 1 and scope 2 are known, and scope 3 is missing. The number of Full-Time Equivalents (FTEs) is not known for every healthcare institution, leading to the absence of this scope for several of them. This results in an underestimation of the total scope 3.
SDG	SDG 13.2
Data quality estimate	3 Part of the data has been based on energy consumption data delivered by the three largest energy operators in the Netherlands for clusters of buildings, but when these data have not been available estimated values have been used based on sector specific data, therefore data quality score is 3. Score | Quality requirement 1 | Audited data or actual primary data 2 | Non-audited data, or other primary data 3 | Average data that is peer/(sub)sector-specific 4 | Proxy data on the basis of region or country 5 | Estimated data with very limited support

Topic	Description
Data	Cadastral parcels in ownership of healthcare institutions
Data files	UITVOER_ZORG_KVK_REPUBLIQ_20211101.xlsx
Data Source	Kadaster
Year	2021
Last update	09-12-2021
Date of download	09-12-2021
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	2
Unit of measurement	Not applicable

Selections	Not applicable
Data transformation	Not applicable
Data missing	Not applicable
Print screens	Not applicable

Topic	Description
Data	Energy consumption (Enexis)
Data files	Energierapport Republiq - 20230918.xlsx
Data Source	Enexis
Year	2020, 2021 & 2022
Last update	18-9-2023
Date of download	18-9-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	2
Unit of measurement	kWh for electricity and m^3 for natural gas
Selections	Not applicable
Data transformation	Not applicable
Data missing	For some clusters Republiq did not receive energy consumption data. This can have several causes: - Enexis could not find an address (this is most often the case for addresses with an add-on. For example, house number 1-A) - The address is assigned to a connection for large consumption (grootverbruik). Net operators are not allowed to share this data.
Print Screens	Not applicable

Topic	Description
Data	Energy consumption (Liander)
Data files	Oplevering AL-24540997.xlsx
Data Source	Liander
Year	2020, 2021 & 2022
Last update	20-9-2023
Date of download	20-9-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	2
Unit of measurement	kWh for electricity and m^3 for natural gas
Selections	Not applicable
Data transformation	Not applicable
Data missing	For some clusters Republiq did not receive energy consumption data. This can have several causes: - Liander could not find an address (this is most often the case for addresses with an add-on. For example, house number 1-A) - The address is assigned to a connection for large consumption (grootverbruik). Net operators are not allowed to share this data.
Print Screens	Not applicable

Topic	Description
Data	Energy consumption (Stedin)
Data files	Republiq1-8.xlsx
Data Source	Stedin
Year	2020, 2021 & 2022
Last update	13-9-2023
Date of download	13-9-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	Not applicable
Internal location	Data can be requested from Republiq
Data quality	2
Unit of measurement	kWh for electricity and m^3 for natural gas
Selections	Not applicable
Data transformation	Not applicable
Data missing	For some clusters Republiq did not receive energy consumption data. This can have several causes: - Stedin could not find an address (this is most often the case for addresses with an add-on. For example, house number 1-A) - The address is assigned to a connection for large consumption (grootverbruik). Net operators are not allowed to share this data.
Print Screens	Not applicable

Topic	Description
Data	Electricity use (kWh) and natural gas use (Nm^3) per healthcare institution
Data file	Original files: 4 files of 4 healthcare institutions 20231101 - BNG_energieverbruik_zorg.xlsx Edited files : Energiedata BNG Bank.csv 231208 Aanvulling zorginstellingen vanuit data vorig jaar BNG Bank.xlsx 231208_Energieverbruik BNG Bank_missende zorginstellingen aangevuld.xlsx
Data Source	Republiq
Year	2020, 2021 & 2022
Last update	Not applicable
Date of download	Received by MSafe 11-10-2023
Link to webpage	Not applicable
Filters used to obtain the datafile	From original file only column woningcorporatie, kvk, elektra, and gas has been selected.
Internal location	Original files and edited files: Klantgroepen\Zorgsector\SDG_13.2_CO2-emissies zorginstellingen\PCAF data
Data quality	3 Part of the data is based on energy consumption data delivered by the three largest energy operators in the Netherlands for clusters of buildings, but when these data has not been available estimated values have been used based on sector specific data, therefore data quality score is 3.
Unit of measurement	kWh for electricity and Nm^3 for natural gas
Selections	Not applicable
Data transformation	Not applicable
Data missing	Energy consumption data is only available for houses located in the areas of the three largest network operators (Enexis, Stedin, and Liander).

Print Screens	Klantgroepen\Zorgsector\SDG_13.2_CO2-emissies zorginstellingen\PCAF data\Printscreens Downloadsite MSafe voor datadeling tussen Republiq en Het PON & Telos energie onderwijs -zorg BNG Bank.png

Topic	Description
Data	Villages and cities overview in the Netherlands
Data file	230726_Woonplaatsen_in_Nederland_2022.xlsx
Data Source	CBS, Statline
Year	2022
Last update	16-4-2022
Date of download	26-7-2023
Link to webpage	https://opendata.cbs.nl/statline/#/CBS/nl/dataset/85210NED/table
Filters used to obtain the datafile	Woonplaatsen: Woonplaatsen op alfabet Onderwerp: gemeentenaam, gemeentecode, provincienaam, provinciecode
Internal location	Klantgroepen\Zorgsector\SDG_13.2_CO2-emissies zorginstellingen\PCAF data
Data quality estimate	Not applicable
Unit of measurement	Not applicable
Selections	Not applicable
Data transformation	Not applicable
Data missing	Not applicable
Print screens	Klantgroepen\Zorgsector\SDG_13.2_CO2-emissies zorginstellingen\PCAF data\Printscreens 20230726_Woonplaatsen Nederland 2022 v1 t/m v15.png

Topic	Description
Data	Average mobility per person per year (part 1: data on province level)
Data file	Original file: 230726_Mobiliteit_per_persoon_persoonskenmerken_motieven_en_regio_s_1102023_120249.xlsx Sheet: Mobiliteit_per_persoon_persoo Edited file: The original file is part of the PCAF-database and all calculation steps to work towards scope 3 with this file are done in the PCAF-database.
Data Source	CBS, Statline
Year	2020, 2021 & 2022
Last update	5-7-2022
Date of download	26-7-2023
Link to webpage	https://opendata.cbs.nl/statline/#/CBS/nl/dataset/84713NED/table?ts=1603811773192
Filters used to obtain the datafile	Populatie: 12 jaar of ouder Marge: waarde Regio's: provincies Reismotieven: van en naar het werk & zakelijk, beroepsmatig Persoonskenmerken: participatie: werkzaam 30 uur pw of meer Geslacht: totaal mannen en vrouwen Onderwerp: gemiddeld per persoon per jaar / afstand Perioden: 2018-2022
Internal location	Klantgroepen\Zorgsector\SDG_13.2_CO2-emissies zorginstellingen\PCAF data
Data quality	Score 3

	With sample surveys, such as the ODiN, information is collected from only part of the population. The estimated results based on the sample data are generally not equal to the actual values and therefore have margins of inaccuracy. For more information, see https://www.cbs.nl/nl-nl/onze-diensten/methoden/onderzoeksomschrijvingen/korte-onderzoeksbeschrijvingen/onderweg-in-nederland
Unit of measurement	km
Selections	Not applicable
Data transformation	Some data was missing. See for the transformation Data missing.
Data missing	For some provinces data was missing. If possible, the missing data was filled with data from a larger region of the Netherlands from data file Mobiliteit_per_persoon_persoonskenmerken_motieven_en_regio_s_09102023_125623.xlsx E.g.: the data for province of Zeeland was missing, therefore data of West-Nederland was used.
Print screens	Klantgroepen\Zorgsector\SDG_13.2_CO2-emissies zorginstellingen\PCAF data\Printscreens 20230726_mobiliteit_per_persoon_afstand_perjaar_provincie.png

Topic	Description
Data	Average mobility per person per year (part 2: data on level of a region larger than province)
Data file	Original file: 230726_Mobiliteit_per_persoon_persoonskenmerken_motieven_en_regio_s_09102023_125623.xlsx Sheet: Mobiliteit_per_persoon_persoo Edited file: The original file is part of the PCAF-database and all calculation steps to work towards scope 3 with this file are done in the PCAF-database.
Data Source	CBS, Statline
Year	2020, 2021 & 2022
Last update	5-7-2023
Date of download	26-7-2023
Link to webpage	https://opendata.cbs.nl/statline/#/CBS/nl/dataset/84713NED/table?ts=1603811773192
Filters used to obtain the datafile	Populatie: 12 jaar of ouder Marge: waarde Regio's: landsdelen: Noord-Nederland, Oost-Nederland, West-Nederland en Zuid-Nederland Reismotieven: van en naar het werk & zakelijk, beroepsmatig Persoonskenmerken: participatie: werkzaam 30 uur pw of meer Geslacht: totaal mannen en vrouwen Onderwerp: gemiddeld per persoon per jaar/ afstand Perioden: 2018-2022
Internal location	Klantgroepen\Zorgsector\SDG_13.2_CO2-emissies zorginstellingen\PCAF data
Data quality	Score 3 With sample surveys, such as the ODiN, information is collected from only part of the population. The estimated results based on the sample data are generally not equal to the actual values and therefore have margins of inaccuracy. For more information, see https://www.cbs.nl/nl-nl/onze-diensten/methoden/onderzoeksomschrijvingen/korte-onderzoeksbeschrijvingen/onderweg-in-nederland
Unit of measurement	km
Selections	Not applicable
Data transformation	Not applicable

Data missing	Data in this file was used to fill up the missing values in data file: 230726_Mobiliteit_per_persoon_persoonskenmerken_motieven_en_regio_s_1102023_120249.xlsx These steps were done in the PCAF-database.
Print screens	Klantgroepen\Zorgsector\SDG_13.2_CO2-emissies zorginstellingen\PCAF data\Printscreens 20230726_mobiliteit_per_persoon_afstand_perjaar_landsdelen.png

Topic	Description
Data	Transportation methods used per person per province
Data file	230726_Mobiliteit_per_persoon_persoonskenmerken_vervoerwijzen_en_regio_s_09102023_130456.xlsx Sheet: Mobiliteit_per_persoon_persoo
Data Source	CBS, Statline
Year	2020, 2021 & 2022
Last update	5-7-2022
Date of download	26-7-2022
Link to webpage	https://opendata.cbs.nl/statline/#/CBS/nl/dataset/84709NED/table?ts=1603813016233
Filters used to obtain the datafile	Populatie: 12 jaar of ouder Geslacht: totaal mannen en vrouwen Persoonskenmerken: werkzaam 30 uur pw of meer Vervoerswijzen: totaal / personenauto (bestuurder) / personenauto (passagier) / trein / bus-tram-metro / fiets / lopen / overige vervoerswijze Onderwerp: gemiddeld per persoon per jaar / afstand Periode: 2018 -2022 Marge: waarde Regio's: totalen / landsdelen / provincies / overig
Internal location	Klantgroepen\Zorgsector\SDG_13.2_CO2-emissies zorginstellingen\PCAF data
Data quality	Score 3 With sample surveys, such as the ODiN, information is collected from only part of the population. The estimated results based on the sample data are generally not equal to the actual values and therefore have margins of inaccuracy. For more information, see https://www.cbs.nl/nl-nl/onze-diensten/methoden/onderzoeksomschrijvingen/korte-onderzoeksbeschrijvingen/onderweg-in-nederland
Unit of measurement	km
Selections	Not applicable
Data transformation	In the sheet 'Mobiliteit_per_persoon_persoo' some data was missing for provinces. In the PCAF-database missing data was filled with data from a larger area than provinces or the value for the Netherlands.
Data missing	For the missing values the lowest possible available geographic scale level was used. E.g.: if the data for the province of Groningen is missing, then the data for Noord-Nederland (LD) was used. If that data was not available too, the data for the whole Netherlands was used.
Print screens	Klantgroepen\Zorgsector\SDG_13.2_CO2-emissies zorginstellingen\PCAF data\Printscreens 20230726_mobiliteit vervoerswijzen afstand per persoon per jaar v1 t/m v4.png

Topic	Description
Data	FTE per healthcare institution
Data files	Original files: DigiMV_Origineel_Voorlopige+dtaset+2022_20230724.ods 231023_FTE2018-2020-2021 BNG Bank.xlsx

	Edited datafiles: 231016_FTE zorginstellingen BNG Bank 2022.xlsx
Data Source	CIBG; Ministerie van Volksgezondheid Welzijn en Sport
Year	2020, 2021 & 2022
Last update	Unknown
Date of download	31-7-2023
Link to webpage	https://www.jaarverantwoordingzorg.nl/gegevens-bekijken/verantwoordingsgegevens-per-verslagjaar-datasets
Filters used to obtain the datafile	Not applicable
Internal location	Klantgroepen\Zorgsector\SDG_13.2_CO2-emissies zorginstellingen\PCAF data
Data quality	Score 2 Data is acquired by CIBG from individual annual reports of healthcare institutions. The source data in the annual report is audited, the composite dataset of CIBG is not.
Unit of measurement	FTE
Selections	Not applicable
Data transformation	Sum of personnel in paid employment, self-employed persons and hired staff.
Data missing	Not applicable
Print screens	Klantgroepen\Zorgsector\SDG_13.2_CO2-emissies zorginstellingen\PCAF data\Printscreens 20230731_Database download DigiMV 2022 (voorlopige dataset).png 20230731_Download locaties datasets Volksgezondheid, Welzijn en sport.png

List of the calculation sheets	Location
231005_Leningportefeuille BNG Bank.csv 231208_Energieverbruik BNG Bank.csv 231020_Passiva BNG Bank.csv 231023_FTE BNG Bank.csv Emissiefactoren.csv	Klantgroepen\Zorgsector\SDG_13.2_CO2-emissies zorginstellingen\PCAF data\Brondata voor SQL
CO2-emissies zorg 2020.sql CO2-emissies zorg 2021.sql CO2-emissies zorg 2022.sql	Klantgroepen\Zorgsector\SDG_13.2_CO2-emissies zorginstellingen\SQL scripts
240207 CO2-emissies zorginstellingen.xlsx	Klantgroepen\Zorgsector\SDG_13.2_CO2-emissies zorginstellingen

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About Het PON & Telos

Improving social decision-making

Het PON & Telos is a social knowledge organization at the heart of society. We consider it our mission to improve social decision-making. We do this by linking scientific knowledge to practical knowledge. In this process every voice counts! We collect, investigate, analyze, and interpret opinions and facts using stimulating approaches and innovative methods. In doing so, we are always focused on sustainable development: the harmonious connection between social, environmental and economic objectives. In this way we contribute to the quality of society at large, now and in the future.

With a multidisciplinary and creative team of nearly 30 research consultants, we work mainly for local and regional authorities in the Netherlands, but also for corporate bodies, banks, care and welfare institutions, funds, and social organizations. We work closely with civic organizations and other knowledge institutions and are an official partner of Tilburg University. We use our knowledge and insights to advise initiators, policy-makers and managers. This enables them to make informed choices and give a positive impulse to the society of tomorrow.

Stationsstraat 20c
5038 ED Tilburg
+31 (0)13 535 15 35
info@hetpon-telos.nl
hetpon-telos.nl