GHG-Emissions (PCAF method) of the Loan Portfolio of NWB Bank

Reporting year 2019

telos brabants centrum voor duurzame ontwikkeling

HET PON

Tilburg University

Official Partner Tilburg University

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Rens Mulder, MSc.
Drs. John Dagevos

Telos / Het PON

Colophon

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NWB BANK

Authors

Rens Mulder, MSc.
R.Mulder@Telos.nl

Drs. John Dagevos
J.F.L.M.M.Dagevos@uvt.nl

+31 13 535 15 35

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Website

www.hetpon.nl

Executive summary

In the context of the global Paris Climate Agreement, the Dutch Platform Carbon Accounting Financials (PCAF), a collaboration between Dutch financial institutions, has launched an initiative to develop a methodology for carbon accounting of the different types of asset classes within financial institutions. NWB Bank has formally committed January 2019 to the PCAF initiative.

NWB Bank asked Telos/Het PON, official partner of Tilburg University, to measure the Greenhouse Gas (GHG) emissions associated with the bank's lending portfolio, using the latest PCAF methodology. Telos/Het PON is specialized in monitoring sustainability in the public sector, and impact reporting for the financial sector.

Towards a PCAF methodology for the NWB Bank

This study builds on the experience gained in another Dutch public sector PCAF study carried out by Telos in December 2019. These methods developed by Telos for evaluating public sector organizations are being applied in this study to calculate the PCAF outcomes of the NWB Bank over reporting year 2019.

Available data on carbon dioxide equivalent emissions (representing the targeted Green House Gasses-GHG), or estimated emissions by using impact data and appropriate emission factors, were used to calculate the impact of different sectors of NWB Bank loan portfolio. The impact data include as well direct (scope 1) as indirect emissions (scope 2 and 3). Besides the calculation of the GHG emissions, a ratio between invested value and enterprise value was used for the attribution of NWB Bank loans to the total assets of GHG emitting clients. This results in the attributed GHG emissions to NWB Bank's loans.

For banks it is in this phase practically impossible to include GHG emissions for all activities, due to lack of sufficient data. When 60-70% of the loan portfolio is included in the PCAF analysis a major achievement is reached. For NWB Bank it has, because of its unique position in the market, been possible to cover 93% of its balance sheet in this GHG emission reporting, as illustrated in table S1.

An overview of total CO_2 equivalent emissions for the loan portfolio of NWB Bank in reporting year 2019 is given in table S2.

Table S1. Total outstanding loans (nominal value) of NWB Bank and part covered in GHG assessment

Sector	Subsector	Total NWB loan portfolio	Percentage of loan portfolio	Part covered with GHG-emission calculation	
		mln EUR	%	mln EUR	%
Social housing					
	Total	30,813	64.6%	30,790	99.9%
Water Authorities					
	Total	6,501	13.6%	6,501	100%
Municipalities					
	Total	5,346	11.2%	5,346	100%
Healthcare					
	Total	2,053	4.3%	1,522	74.1%
Provinces					
	Total	225	0.5%	225	100%
Others					
	Organizations	2,441	5.1%	0	0%
	Projects	333	0.7%	0	0%
Total		**47,711**	**100%**	**44,383**	**93.0%**

Table S2. NWB Bank total PCAF based GHG emissions per sector in reporting year 2019

Sector	Total outstanding loans covered	Attributed emissions	Emission intensity	Data quality score
	mln EUR	Kton CO_2 eq.	kton CO_2 eq. / billion EUR	high quality = 1, low quality = 5
Social Housing	30,790	1,810	58.79	2.5
Water Authorities	6,501	239	36.82	1
Municipalities	5,346	490	91.67	3
Healthcare	1,522	82	54.04	2.5
Provinces	225	14	62.65	3
Others	0	-	-	-
Total	**44,383**	**2,636**	**59.39**	**2.5**

There are some variations to be seen in outcome table S2. Municipalities have a relatively high emission intensity, which is mainly due to a high contribution of Scope 3 activities. Water Authorities score relatively low because of the low scope 1 activities. The contribution of natural gas to the total CO_2 emissions of Water Authorities is only 11%.

Lowest emission intensities are found for the Water Authorities sector and highest in the Municipalities sector. The quality of the data are highest in the Water Authorities sector and lowest for the Municipalities and Provinces sectors. Although a data quality score of 3 is already quite high compared with other PCAF studies in the financial sector.

Table of Contents

1 Introduction

Since the 2015 Paris Climate Conference, the banking sector has been involved in contributing to the realization of the ambitions of the Paris Agreement. An important factor in this endeavor is to measure and disclose its carbon emissions. In this context the Dutch Platform Carbon Accounting Financials (PCAF), a collaboration between Dutch financial institutions, has launched an initiative in 2015 to develop a methodology for the different types of asset classes within financial institutions. In the meantime it has become a global initiative[1]. NWB Bank formally committed in January 2019 to the initiative[2].

A first method for carbon accounting for financials was launched in November 2017. An update was published in the report 'Accounting GHG emissions and taking action: Harmonised approach for the financial sector in the Netherlands, Platform Carbon Accounting Financials (PCAF) report 2019[3]'. This report was the basis for the methodology applied in this report for the assets of NWB Bank in reporting year 2019.

NWB Bank asked Telos/Het PON, official partner of Tilburg University, in 2019 to measure the Greenhouse Gas (GHG) emissions associated with the bank's lending portfolio, using the PCAF methodology. In 2019 Telos developed a method to include public sector organizations with balance sheet financing in the PCAF assessment for the BNG Bank. This new methodology is used in this report as well, and the methodology was added to the harmonized approach report of the PCAF platform (2019, p. 91.) . Telos/Het PON has a lot of experience measuring and monitoring sustainability in the public sector. This knowledge proofed to be very useful in developing a PCAF approach for the Dutch public sector.

[1] https://carbonaccountingfinancials.com/
[2] https://www.carbonaccountingfinancials.com/financial-institutions-taking-action
[3] https://carbonaccountingfinancials.com/regional-implementation-team/pcaf-europe

2 How the PCAF methodology has been applied for NWB Bank

Table 2.1 gives a summary of the newly developed approach for public sector loans. It shows the relevant NWB Bank sectors and how they are linked to the PCAF Asset Classes. Among PCAF Asset Classes, four are mainly important:

- Sovereign bonds
- Project finance
- Commercial real estate
- Corporate/SME loans.

For municipalities a somewhat adapted approach was developed as will be discussed in the sector specific section below.

Table 2.1 Foreseen PCAF methodology for NWB Bank sectors.

NWB Bank			PCAF Asset Class *				
Sector	Share of total loan portfolio	Share covered in PCAF analysis	Sovereign bonds	Project finance	Commercial real estate	Corporate / SME loans	Indirect investments
Social Housing	64.6%	99.9%			X	energy use of the property	
Water Authorities	13.6%	100%	adaptations for public sector		X		
Municipalities	11.2%	100%	adaptations for public sector		X		
Health care	4.3%	74.1%			X	incl. real estate	
Provinces	0.5%	100%	adaptations for public sector		X		

* The asset classes 'listed equity', 'mortgages' and 'corporate bonds' are not applicable for NWB Bank

The total coverage in the 2019 PCAF reporting includes the large majority of loans in NWB Bank's portfolio. Impact data have been calculated per client, and aggregated to sectors. The attribution approach was applied. This means that the emissions are calculated as they relate to the proportion of the finance in a clients' balance sheet or project. The attribution factor has been based on the nominal outstanding loans per 31 December 2019.

In line with PCAF and the GHG Protocol, the methodology per sector is respecting basic accounting principles of Completeness, Consistency, Transparency, Prudence, Balance and Accuracy. In order to ensure completeness, the scope must be defined to determine the emissions accounted for in NWB Bank's value chain. The GHG Protocol standardizes this by categorizing direct and indirect emissions in three scopes:

- Scope 1: All direct GHG emissions by the organization and its value chain (natural gas in offices and fuel use by car fleets);
- Scope 2: Indirect GHG emissions by the organization and its value chain (purchased electricity);
- Scope 3: Other indirect emissions not covered in Scope 2; in total 15 categories within Scope 3 are defined, like purchased goods & services, business travel, employee commuting, and end of life treatment of sold products.

To calculate the emissions the following formula for each client or project was used:

$$\sum_{i=1}^{n} CO_2eq \times \frac{Nominal\ outstanding\ NWB\ loan}{Total\ balance\ sheet}$$

Different data quality levels are considered as shown in Table 2.2.

Table 2.2 General data quality scoring

Score	Quality requirement
1	Audited GHG emissions data or actual primary energy data
2	Non-audited GHG emissions 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

Also the emission intensity has been calculated, that is the attributed emissions per Euro financed.

In the next chapters the results for each sector listed in table 2.1 are presented.

3 Social Housing Sector

The social housing sector is the largest sector within the loan portfolio of the NWB Bank. The sector is accountable for 64.5% of the total loan portfolio of the NWB Bank. Within this sector, 99.9% of the outstanding loans is related to social housing associations. Only 0.1% of the loans is provided to other organizations, not directly related to social housing associations. These organizations can be active in management of real estate or real estate development.

3.1 Coverage

It was possible to calculate the CO_2eq footprint for 99.9% of the loan portfolio within the social housing sector. Emissions were based on scope 1 and 2 activities. An overview of the Social Housing sector is given in table 3.1.

Table 3.1 Coverage rate

Social Housing sector	Number of customers	Loan portfolio (million EUR)	Percentage of sector	Percentage of all loans	Coverage rate (Loan portfolio)
Social housing associations	288	30,790	99.9%	64.5%	100%
Others	6	23	0.1%	0.0%	0%
Total	294	30,813	100%	64.6%	99.9%

Table 3.2 overview of different scopes in Social Housing sector.

Scope 1	Scope 2	Scope 3
Estimation of the natural gas use of the property of corporations.	Estimation of the electricity use of the property of the corporations. Estimation of the purchase of warmth by district heating (Stadsverwarming)	n.a.

3.2 Methodology and data used

The footprint of NWB Bank for the Social Housing sector is calculated based on the emissions of individual social housing associations. The individual emissions of a certain housing type are multiplied by the proportional share of the loan of NWB Bank in the enterprise value. In the end, all individual emissions of social housing associations are aggregated for each housing type and subsequently for all housing types together, using the following formula:

$$\sum_{i=1}^{n} \frac{CO_2eq}{Housing\ type} \times Total\ number\ of\ houses \times \frac{Outstanding\ NWB\ loan}{Enterprise\ value}$$

Different methods were used to calculate different components of the covered emissions. The details are described below.

3.2.1 Scope 1: Natural gas

No exact gas use statistics of natural gas use per social housing association are known. Therefore, an estimation had to be made. To make this estimation as exact as possible, multiple calculation factors were used. CO_2eq emissions caused by natural gas use have been estimated by the energy-labels of the rental units, the type of rental unit, the geographic location and the floor surface of the rental unit.

Data used:

- Number of houses per energy-label per social housing association and municipality (Inspectie Leefomgeving en Transport, dpi h2 2017)
- Number of houses per type of rental unit per social housing association and municipality (Inspectie Leefomgeving en Transport, dvi h2 2017)
- Average floor surface per type of dwelling and municipality (CBS, 2018)
- Average natural gas use (m3/m2) per energy label and type of dwelling (CBS, 2018)
- Percentage of houses connected to district heating (CBS, 2018)
- Emission factor for natural gas (WTW, 1.89 kg CO_2/Nm3 natural gas) (www.co2emissiefactoren.nl)

3.2.2 Scope 2: District heating

No exact district heating statistics per social housing association are known. To make a reliable estimation, multiple calculation factors were used. CO_2 emissions caused by district heating per social housing association have been estimated by the energy-labels of the rental units, the type of rental unit, the geographic location, the floor surface of the rental unit, and the percentage of district heating houses per municipality.

Data used:

- Number of houses per energy-label per social housing association and municipality (Inspectie Leefomgeving en Transport, dpi h2 2017)
- Number of houses per type of rental unit per social housing association and municipality (Inspectie Leefomgeving en Transport, dvi h2 2017)
- Average floor surface per type of housing unit and municipality (CBS, 2018)
- Average natural gas use (m3/m2) per energy label and type of housing unit (CBS, 2018)
- Percentage of houses connected to district heating (CBS, 2018)
- Conversion factor of M3 natural gas to GJ (0.03165 GJ/m3 natural gas) (Klimaatmonitor, 2019)
- Emission factor for district heating (unknown source of district heating, WTW, 0.03597 ton CO_2/GJ district heating) (www.co2emissiefactoren.nl)

3.2.3 Scope 2: Electricity use

No exact electricity use statistics per social housing association are known. Estimations have been made using multiple calculation factors. CO_2 emissions caused by electricity use per social housing association have been estimated by the type of rental unit, the geographic location, the floor surface of the rental unit, the estimated number of residents per rental unit, electricity use per type of rental unit, floor surface and number of residents.

Data used:

- Number of houses per type of rental unit per social housing association and municipality (Inspectie Leefomgeving en Transport, dvi h2 2017)
- Average floor surface per type of dwelling and municipality (CBS, 2018)
- Number of households per municipality (CBS, 2018)
- Number of inhabitants living in households, per municipality (CBS, 2018)
- Electricity use per type of dwelling, per floor surface and per number of inhabitants. (CBS, 2018)
- Emission factor for electricity use (unknown source of electricity, WTW, 0.413 kg CO_2/kWh electricity) (www.co2emissiefactoren.nl)

3.3 Data Quality

The following data quality scoring is used to score and improve data quality on social housing over time. The definitions are based on the general classification criteria mentioned in table 2.2.

Table 3.3 Definitions of data quality classes for the social housing sector

Data quality (highest to lowest)	Description
1	Actual energy consumption, converted to CO_2 eq-emissions using verified emissions factors specific to the type of energy consumed
2	Actual energy consumption, converted to CO_2 eq-emissions using emissions factors for energy from undefined fuel source
3	Estimated energy consumption based on energy performance/energy label and floor area per type of social house in a country, converted to CO_2 eq-emissions using emissions factors for energy from undefined fuel source
4	Estimated energy consumption per type of social house in a country and floor area, converted to CO_2 eq-emissions using emissions factors for energy from undefined fuel source
5	Average energy consumption per social house in a country, converted to CO_2 eq-emissions using emissions factors for energy from undefined fuel source

The CO_2 eq. emissions per housing unit are ideally calculated using energy consumption data per client account. When this is not available, other methods were used. This of course will increase the need to use estimations, and the uncertainty level of the calculations.

The method in this study uses energy labels and floor area per type of social house, converted to CO_2 eq. emissions using emission factors for energy from undefined fuel source (except for gas use, were the energy source is natural gas). This is in compliance with data quality level 3. However, instead of country level averages, municipal averages were

used. This makes the calculation more precise, because of the geographical differences in the Netherlands in energy use. On top of that, we were able to subtract an estimate of energy used within district heating. Therefore the natural gas use estimate is even more precise.

Given the considerations above, the data quality score is estimated at 2.5. It is not as precise as data quality level 2, but it is better than data quality level 3.

3.4 Results

At the end of 2019, NWB Bank had loans outstanding with 91% of the social housing associations in the Netherlands. These social housing associations own 2,340,578 rental houses. An overview of the type or rental units and energy-labels is given in figure 3.1.

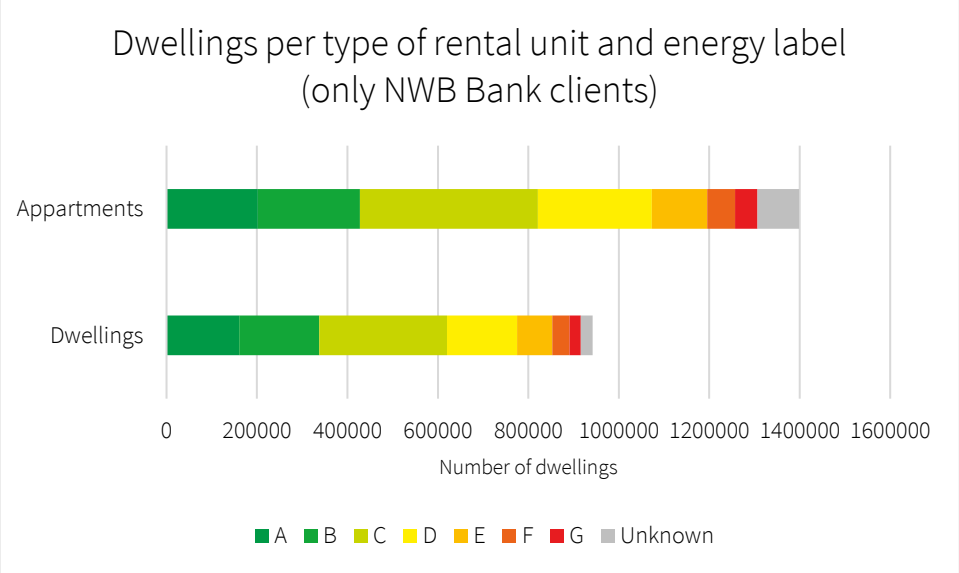

Figure 3.1 Rental units per type of rental unit and energy label

The outcome of the GHG emissions of the Social Housing sector is given in table 3.4.

Table 3.4 GHG emissions associated with NWB Bank's loans to the Dutch social housing sector

Source of emission	Scope	CO_2-eq (total)		CO_2-eq (relative)	Data quality score
		Ton/year	**%**	**Ton/million EUR**	
Direct CO_2-emissies					
Natural gas use	Scope 1	1,145,600	63%	37.2	2.5
Indirect CO_2 emissions by energy use					
Electricity use	Scope 2	615,554	34%	20.0	2.5
District heating	Scope 2	49,156	3%	1.6	2.5
Other indirect CO_2 emissions					
n.a.	Scope 3				
Total		**1,810,311**	**100%**	**58.8**	**2.5**

4 Water Authorities Sector

The Water Authorities sector covers 13.6% of the total loan portfolio of the NWB Bank. More information about these loans are given in table 4.1.

4.1 Coverage

Table 4.1 Coverage for the water authorities sector.

Water Authorities sector	Number of customers	Loan portfolio (million EUR)	Percentage of sector	Percentage of all loans	Coverage rate (Loan portfolio)
Water Authorities	21	6,501	100%	13.6%	100%

It was possible to provide 100% of the loan portfolio within the water authorities sector with a CO_2 footprint.

4.2 Methodology and data used

The method used for this sector is highly comparable to the method of other sectors. First, emissions of the different entities in the subsector are obtained. Subsequently the NWB loan ratio of the total balance sheet is used to determine which part of the emissions NWB Bank is accountable for.

$$\sum_{i=1}^{n} \boldsymbol{CO_2eq} \times \frac{\boldsymbol{Outstanding\ NWB\ loan}}{\boldsymbol{Total\ balance\ sheet}}$$

4.2.1 Scopes

For the calculations for Water Authorities, data was used from the climate monitor water authorities (Arcadis, 2019). This monitor is developed by Arcadis for the Union of Water Authorities (Unie van Waterschappen) and the NWB Bank. This monitor describes the emissions in the three scopes in detail, and per individual water authority.

Data used:

- Arcadis, (2019). Klimaatmonitor Waterschappen: Verslagjaar 2018. Unie van Waterschappen: 31 oktober 2019.

4.3 Data quality

The following data scoring is used to score and improve data quality on public sector organizations.

Table 4.2 Data quality definitions for the Water Authorities sector

Data quality (highest to lowest)	Description
1	Actual energy consumption, converted to CO_2 eq-emissions using verified emission factors and detailed activity data specific to the type of energy consumed
2	Actual energy consumption, converted to CO_2 eq-emissions using emissions factors for energy from undefined fuel source
3	Modeled regional activity data based on robust assumptions, converted to CO2eq-emissions using emissions factors for energy from undefined fuel source
4	Modeled activity data in a country, converted to CO_2 eq-emissions using emissions factors for energy from undefined fuel source
5	Highly modeled activity or uncertain activity data in a country, converted to CO_2 eq-emissions using default emissions factors for energy from undefined fuel source

The method for water authorities is scaled into data quality level 1, because of the detailed underlying information provided in the Arcadis (2019) study.

4.4 Results

The outcome of the CO_2 footprint of the outstanding NWB Bank loans to Water Authorities at the end of 2019 is given in table 4.3

Table 4.3 GHG emissions for the Water Authorities sector.

Source of emission	Scope	CO_2 EQ. (total)		CO_2 EQ. (relative)	Data quality score
		Ton/year	**%**	**Ton/million EUR**	
Direct CO_2-emissies	Scope 1	26,697	11.2%	4.1	1
Indirect CO_2 emissions by energy use	Scope 2	120,765	50.5%	18.6	1
Other indirect CO_2 emissions	Scope 3	91,899	38.4%	14.1	1
Total		**239,361**	**100%**	**36.8**	**1**

5 Municipalities Sector

The municipalities sector covers 11.2% of the total loan portfolio of the NWB Bank. This means that the Municipalities sector is the third largest sector within the total group of clients. The municipalities sector consists of Dutch municipalities. At the end of 2019, 199 Dutch municipalities were a client of the NWB Bank. This is over 56% of the total number of municipalities in the Netherlands (355).

5.1 Coverage

It was possible to provide 100% of the loan portfolio within the Municipalities sector with a CO_2 footprint.

Table 5.1 Coverage rate of NWB Bank Municipalities Sector

Municipalities sector	Number of customers	Loan portfolio (million EUR)	Percentage of all loans	Coverage rate (loan portfolio)
Municipalities	199	5,346	11.2%	100%

5.2 Methodology and data used

To calculate the CO_2 footprint following the PCAF principles, a general approach was developed. First, emissions of the different entities in the sector are calculated. Subsequently the NWB Bank loan ratio of the total balance sheet is used to determine which part of the emissions NWB Bank is accountable for.

$$\sum_{i=1}^{n} \boldsymbol{CO_2eq} \times \frac{\boldsymbol{Outstanding\ NWB\ loan}}{\boldsymbol{Total\ balance\ sheet}}$$

Different methods were used to calculate different components of the covered emissions. These methods used are described below.

5.2.1 Scope 1

Scope 1 emissions are the direct GHG emissions of the organization. For the municipalities, these emissions result from the use of natural gas for heating of buildings and the use of fossil fuel for cars. The exact figures for these sources are however not known per municipality, so some estimations had to be made using multiple calculation factors to achieve the best result possible.

Gas use is estimated by the number of employees, and the natural gas use per sector per municipality. The amount of gas supplied to the total public sector per municipality is available from CBS. However, the public sector in a municipality consists of more than just the municipality organization as such. Since the amount of employees per municipality is known, and the total number of employees in the public sector per municipality is known, this ratio can be used to determine the part of the gas use to be attributed to the

municipality. Subsequently, the emission factor for natural gas use has been applied to determine the CO_2 emission due to natural gas consumption by the municipal organizations.

The use of fossil car fuel by company vehicles is estimated by the number of company vehicles, and the average annual mileage of company vehicles. The number of cars owned by the municipal organizations is not known, but the total number of company vehicles in the public sector can be obtained from CBS. As it is known that roughly 32% of all public sector employees work at local municipalities, it is possible to make an estimation of the number of company vehicles per municipality. With the average annual mileage of company vehicles and the emission factor for unknown fuel use, the CO_2 equivalent emissions from fossil car fuel used by municipalities was estimated.

Data used:

- Supply of natural gas per branch (SBI2008/NACE Rev 2.0) and per municipality (CBS, 2018)
- Number of employees (FTE) per size class of municipalities (A&O research, 2017)
- Number of inhabitants per municipality (CBS, 2017)
- Number of employees in the public sector per COROP (NUTS3) area (LISA, 2018)
- Supply of natural gas per branch (SBI2008/NACE Rev 2.0) and per COROP (NUTS3) area (CBS, 2018)
- Emission factor for natural gas (WTW, 1.89 kg CO_2/Nm3 natural gas) (www.co2emissiefactoren.nl)
- Number of company vehicles in the public sector (SBI2008/NACE Rev 2.0) per year (CBS, 2017)
- Number of company vehicles per fuel source (CBS, 2018)
- Average annual mileage per company car and fuel source (CBS, 2018)
- Emission factor for vehicles with unknown fuel source, and weight class (WTW, 0.22 kg CO_2/vehicle kilometer) (www.co2emissiefactoren.nl)

5.2.2 Scope 2

Scope 2 emissions include the indirect GHG emissions from consumption of purchased electricity, heat or steam. Because the heat and steam use per municipality is unknown, scope 2 will be focused on the use of purchased electricity. As exact figures per municipality are not known, estimations had to be made using multiple calculation factors to arrive at as exact data as possible.

Electricity use is estimated by the number of employees, and the electricity use per sector per municipality. The amount of electricity supplied to the total public sector per municipality is available at CBS. Since the amount of employees per municipality is known and the total number of employees in the public sector per municipality is known their ratio can be used to determine the part of electricity use the municipality is accountable for. This value is used to determine the CO_2 equivalent emission of electricity consumption from the municipal organizations.

Data used:

- Supply of electricity per branch (SBI2008/NACE Rev 2.0) and per municipality (CBS, 2018)
- Number of employees (FTE) per size class of municipalities (A&O research, 2017)
- Number of inhabitants per municipality (CBS, 2017)
- Number of employees in the public sector per COROP (NUTS3) area (LISA, 2018)
- Supply of electricity per branch (SBI2008/NACE Rev 2.0) and per COROP (NUTS3) area (CBS, 2018)
- Emission factor for electricity (WTW, 0.413 kg CO_2/kWh electricity) (www.co2emissiefactoren.nl)

5.2.3 Scope 3

Scope 3 covers all other indirect emissions. Some examples of scope 3 activities prominent in government activities include emissions from employee commuting, business travel, and outsourced contractor activities. The scope 3 emissions per municipality are unknown, but they can be estimated by the annual spending of municipalities (IV3/COFOG).

The IV3 spending database is divided into functions. Each function has its own purpose. Examples of such functions are safety, education or social domain. In total, there are 8 functions and 54 sub-functions. These sub-functions are via a matrix connected with categories. The expense items describe where the money is spent. In this case, only category 3 “Goods and Services” is relevant to calculate the scope 3 emissions. These expenses describe the goods and services that are delivered for a payment, in a hire or purchase construction. 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 all goods with a lifespan greater than one year. Category 3.3 (areal lease) and category 3.4 (social benefits in kind) are not taken in considerations because of the underlying principles. Category 3.5 describes the insourced employees, and 3.8 are other goods and services such as tools, food and other expenses.

The sub-functions and categories have been linked to the IV3/COFOG codes of the production statistics. In this way, it is possible to calculate which part of the municipal expenses has been spend on which sectoral production category. Because only the expenses on goods and services are taken into consideration, this makes the estimation quite specific.

After the establishment of this connection, estimations of the CO_2 equivalent emissions can be made by using the nationwide CO_2/Euro rate per COFOG category (CBS, 2018).
There is one qualifying remark that has to be taken into account in this approach. The expenses on natural gas and electricity are also included in the spending on category 3.8. Therefore, in the end, the scope 1 and scope 2 emissions are subtracted from the total scope 3 emissions to avoid double counting. Unfortunately, there are still remaining expenses on electricity, warmth and gas under scope 3. These should actually be represented in the scope 1 and scope 2 statistics. These are however not separated from other expenses, so it was decided to keep them under scope 3.

For these reasons it is important to note that the results for scope 3 will be slightly overestimated, and for scope 1 and scope 2 slightly underestimated.

Data used:

- Municipal expenses per function and category (IV3/COFOG) in the annual account (CBS, 2017, secondary placement)
- Added value based on production per sector (SBI2008/NAVE Rev 2.0) annual nationwide (CBS, 2018)
- CO_2emissions on national accounts per sector (SBI2008/NAVE Rev 2.0) annual nationwide (CBS, 2018)
- Connection between functions categories and sectors developed by Telos (see Annex 1)

5.3 Data quality

The following data scoring is used to score and improve data quality on municipal organizations.

Table 5.2 Data quality definitions for the public sector

Data quality (highest to lowest)	Description
1	Actual energy consumption, converted to CO_2 eq-emissions using verified emission factors and detailed activity data specific to the type of energy consumed
2	Actual energy consumption, converted to CO_2 eq-emissions using emissions factors for energy from undefined fuel source
3	Modeled regional activity data based on robust assumptions, converted to CO_2 eq-emissions using emissions factors for energy from undefined fuel source
4	Modeled activity data in a country, converted to CO_2 eq-emissions using emissions factors for energy from undefined fuel source
5	Highly modeled activity or uncertain activity data in a country, converted to CO_2 eq-emissions using default emissions factors for energy from undefined fuel source

The CO_2 eq emissions per municipality are ideally calculated using energy consumption data per client account. When this is not available, other methods have to be used. This of course will increase the uncertainty level of the calculations.

The method used for municipalities in this study is based on robust estimations of electricity and natural gas use, converted to CO_2 eq emissions using emission factors. For natural gas use, this is a known specific type of energy, but for electricity use, energy comes from undefined sources. This is in compliance with data quality level 3. The scope 3 calculations are based on local actual expenses, and national averages on CO_2 emissions. Therefore, this method is scaled into quality level 3.

5.4 Results

The outcome of the CO_2 footprint of the outstanding NWB Bank loans to Dutch municipalities at the end of 2019 is given in table 5.3

Table 5.3 GHG emissions for the NWB Municipalities sector

Source of emissions	Scope	CO_2 EQ. (total)		CO_2 EQ. (relative)	Data quality score
		Ton/year	**%**	**Ton/million EUR**	
Direct CO_2-emissies					
Natural gas use	Scope 1	10,475	2.1%	2.0	3
Fossil car fuel use	Scope 1	1,028	0.2%	0.2	4
Indirect CO_2 emissions by energy use					
Electricity use	Scope 2	27,856	5.7%	5.2	3
Other indirect CO_2 emissions					
Purchased goods and services	Scope 3	450,719	92.0%	84.3	3
Total		490,078	100%	91.7	3

6 Health Care Sector

The health care sector accounts for 4.3% of the total loan portfolio of NWB bank.

6.1 Coverage

Table 6.1 Coverage rate for the Health Care Sector.

Health care sector	Number of customers	Loan portfolio (million EUR)	Percentage of sector	Percentage of all loans	Coverage rate (loan portfolio)
Total	207	2,053	100%	4.3%	74.1%

As shown in table 6.1, 74.1% of the organizations in the health care sector has been provided with a CO_2 equivalent emissions footprint. This means that 25.9% is not covered in the analysis. The main reason for this is lack of adequate data, as the Ministry of Health, Welfare and Sport does not cover all the organizations in its financial statements.

6.2 Methodology and data used

The footprint of NWB Bank for the health care sector is calculated based on the emissions of individual organizations. The individual emissions of an organization are multiplied by the proportional share of the loan of NWB Bank in the balance sheet. In the end, all individual emissions of health care organizations are aggregated, using the following formula:

$$\sum_{i=1}^{n} CO2eq \times \frac{Outstanding\ NWB\ loan}{Total\ balance\ sheet}$$

Different methods were used to calculate different components of the covered emissions. The details are described below, based on the different scopes defined by PCAF.

6.2.1 Scope 1

Scope 1 emissions are the direct GHG emissions of the organizations. For health care organizations, these emissions result from the use of natural gas for heating of buildings, or for disinfection of medical tools. The actual natural gas use per organization is unknown, but the costs of natural gas consumption are mentioned in the financial statements collected by the Ministry of Health, Welfare and Sport. This means that some estimations had to be made to come to the actual CO_2 emissions, but the estimations were done using an accurate reliable data base.

Natural gas use is estimated by the expenditure on natural gas and the average yearly price index of natural gas. Because natural gas gets cheaper per m3 if one consumes more, averages had to be used to come to estimates. CBS provides these numbers, making it possible to come to reliable estimations.

Subsequently, the emission factor for natural gas has been used to determine the CO_2 emission of natural gas used in health care organizations.

Ideally, emissions from other sources in the primary process of health care organizations would be taken into account as well. For example from other gasses used for medical procedures, from ambulances and trauma helicopters. 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.

Data used:

- Total costs of natural gas per health care organization (CBIG, Archief DigiMV, 2018)
- Total costs of natural gas per health care organization (CBIG, Archief DigiMV, 2017)
- Total costs of natural gas per health care organization (CBIG, Archief DigiMV, 2016)
- Yearly financial reports of different health care organizations (multiple sources, 2019/2018)
- Annual natural gas prices (transaction prices, businesses and organizations) in four different price classes (CBS, 2017)
- Conversion factor for natural gas of 0.03165 GJ/m3 (Klimaatmonitor, 2019)
- Emission factor for natural gas (WTW, 1.89 kg CO_2/Nm3 natural gas) (www.co2emissiefactoren.nl, 2018)
- Total balance sheet per organization (CBIG, Archief DigiMV 2018)

6.2.2 Scope 2

Scope 2 emissions include the indirect GHG emissions from consumption of purchased electricity, heat or steam. Because the heat and steam use per health care organization is unknown, scope 2 will be based on the use of purchased electricity. As exact figures per organization are not known, estimations had to be made using multiple calculation factors to arrive at as exact data as possible.

Electricity use is estimated in roughly the same way as natural gas use. The actual electricity use per organization is unknown, but the costs of electricity consumption are mentioned in the financial statements collected by the Ministry of Health, Welfare and Sport. This means that some estimations had to be made to come to the actual CO_2 emissions, but the estimations were done using a reliable database.

Furthermore, electricity use is estimated by the expenditure on electricity and the average yearly price index of electricity. Because natural gas gets cheaper per kWh if one consumes more, averages had to be used to come to a reliable estimation. CBS provides these numbers, making it possible to come to reliable estimations.

The emission factor for electricity consumption has been used to determine the CO_2 eq. emission for the health care organizations.

Data used:

- Total costs of electricity per health care organization (CBIG, Archief DigiMV, 2018)
- Total costs of electricity per health care organization (CBIG, Archief DigiMV, 2017)

- Total costs of electricity per healthcare organization (CBIG, Archief DigiMV, 2016)
- Yearly financial reports of different health care organizations (multiple sources, 2019/2018)
- Annual electricity prices (transaction prices, businesses and organizations) in five different price classes (CBS, 2017)
- Total balance sheet per organization (CBIG, Archief DigiMV, 2018)
- Emission factor for electricity (WTW, 0.413 kg CO_2/kWh electricity) (www.co2emissiefactoren.nl, 2018)

6.2.3 Scope 3

Scope 3 covers all other indirect emissions. Some examples of scope 3 activities prominent in health care include emissions from employee commuting, business travel, waste processing, and food processing.

Unfortunately, no data was available to make estimations for waste and food processing. Therefore, only employee commuting and business travel have been taken into account. Again, no exact data was available, so estimations had to be made.

Estimations were made on the basis of regional commuting and business travel statistics from CBS, and the number of employees per organization. On average, Dutch employees are traveling 3020 km per year commuting from and to work (CBS, 2017), but these numbers vary geographically. For other corporate business trips, employees travel on average 433 kilometer a year (CBS, 2017).

From these trips, 74% of the distance travelled is done by car, either as driver or passenger. 11.8% of the distance travelled is done by train, 6.5% per bicycle, 2.8% by bus/tram/metro and 0.8% walking. The rest of the distance covered is done in unknown ways.

Using the location of the health care organization, the above mentioned statistics, the emissions factors for mobility, and the total number of employees per organization (in FTE), an estimation was made of the CO_2 footprint of commuting and business travel.

Data used:

- Number of employees (in FTE) per organization (CBIG, Archief DigiMV, 2018)
- Number of employees (in FTE) per organization (CBIG, Archief DigiMV, 2017)
- Number of employees (in FTE) per organization (CBIG, Archief DigiMV, 2016)
- Yearly financial reports of different healthcare organizations (multiple sources, 2019/2018)
- Geographically based annual averages (provinces/NUTS2) for commuting distance (CBS, 2017)
- Geographically based annual averages (provinces/NUTS2) for business travel distance (CBS, 2017)
- Total balance sheet per organization (CBIG, Archief DigiMV, 2018)
- Distance travelled per means of transportation (CBS, 2017)
- Conversion factor for passenger kilometers to vehicle kilometers (the average occupancy rate of vehicles is 1.39 per car) (www.co2emissiefactoren, 2018)

- Emission factor for vehicles with unknown fuel source, and weight class (WTW, 0.22 kg CO_2/vehicle kilometer) (www.co2emissiefactoren.nl, 2018)
- Emission factor for trains with unknown fuel source, and type (WTW, 0.006 kg CO_2/ kilometer) (www.co2emissiefactoren.nl, 2018)
- Emission factor for trains busses with unknown fuel source, and type (WTW, 0.14 kg CO_2/ kilometer) (www.co2emissiefactoren.nl, 2018)
- Emission factor for trams (WTW, 0.095 kg CO_2/ kilometer) (www.co2emissiefactoren.nl, 2018)
- Emission factor for metro (WTW, 0.084 kg CO_2/ kilometer) (www.co2emissiefactoren.nl, 2018)

6.3 Data quality

The following definitions for data scoring is used to score data quality on health care organizations (see table 6.2).

Table 6.2 Definitions of data quality classes for the health care sector

Data quality (highest to lowest)	Description
1	Actual energy consumption, converted to CO_2 eq-emissions using verified emissions factors and detailed activity data specific to the type of energy consumed
2	Actual energy consumption, converted to CO_2 eq-emissions using emissions factors for energy from undefined fuel source
3	Modeled regional activity data based on robust assumptions, converted to CO_2 eq-emissions using emissions factors for energy from undefined fuel source
4	Modeled activity data in a country, converted to CO_2 eq-emissions using emissions factors for energy from undefined fuel source
5	Highly modeled activity or uncertain activity data in a country, converted to CO_2 eq-emissions using default emissions factors for energy from undefined fuel source

The GHG emissions per health care organization are ideally calculated using energy consumption data per client account. When this is not available, other methods were used. This of course will increase the uncertainty level of the calculations.

The method used for health care organizations in this study is based on robust estimations of electricity and natural gas. These estimations can be made based on actual expenditure on gas and electricity consumption per client. For natural gas use, this is a known specific type of energy, but for electricity use, energy comes from undefined sources. That is why scope 1 has a data quality value of 1.5, and scope 2 has a data quality estimate of 2. Scope 3 level data was estimated based on national averages. Therefore, this method has a data quality score of 4.

6.4 Results

The outcome of the CO_2 footprint of the outstanding NWB Bank loans to the health care sector at the end of 2019 is given in table 6.3. The overall data quality score is estimated at 2.5, because scope 1 and scope 2 level emissions (with high data quality scores) have the largest share in the total emission for the health care sector.

Table 6.3 GHG emissions calculated for the health care sector

Source of emission	Scope	CO_2 (total)		CO_2 (relative)	Data quality score
		Ton/year	**%**	**Ton/million EUR**	
Direct CO_2-emissies					
Natural gas use	Scope 1	45,110	54.9%	29.6	1.5
Indirect CO_2 emissions by energy use					
Electricity use	Scope 2	30,435	37.0%	20.0	2
Other indirect CO_2 emissions					
Commuting (car)	Scope 3	6,449	7.8%	4.2	4
Commuting (train)	Scope 3	39	0.0%	0.0	4
Commuting (bicycle)	Scope 3	0	0.0%	0.0	4
Commuting (bus/tram/metro)	Scope 3	197	0.2%	0.1	4
Commuting (walking)	Scope 3	0	0.0%	0.0	4
Total		82,230	100%	54.0	2.5

7 Provinces Sector

Dutch provinces account for only 0.5% of the total loan portfolio of the NWB Bank. There is currently 1 customer within this sector. This is a provincial government.

7.1 Coverage

It was possible to provide all provinces with a CO_2 footprint. Therefore, the coverage rate of this sector is 100%. An overview is given in table 7.1.

Table 7.1 Coverage rate for the Provinces Sector

Provinces sector	Number of customers	Loan portfolio (million EUR)	Percentage of sector	Percentage of all loans	Coverage rate (loan portfolio)
Provinces	1	225	100%	0.5%	100%

7.2 Methodology and data used

To calculate the CO_2 footprint following the PCAF principles, a general approach was developed. First, emissions of the different entities in the sector are calculated. Subsequently the NWB Bank loan ratio of the total balance sheet is used to determine which part of the emissions NWB Bank is accountable for.

$$\sum_{i=1}^{n} \boldsymbol{CO_2eq} \times \frac{\boldsymbol{Outstanding\ NWB\ loan}}{\boldsymbol{Total\ balance\ sheet}}$$

Different methods were used to calculate different components of the covered emissions. These methods used are described below.

7.2.1 Scope 1

Scope 1 emissions are the direct GHG emissions of the organization. For the Provinces, these emissions result from the use of natural gas for heating of buildings and the use of fossil fuel for cars. The exact figures for these sources are however not known per province, so some estimations had to be made using multiple calculation factors to achieve the best result possible.

Gas use is estimated by the number of employees, and the natural gas use per sector per provincial organization. The amount of gas supplied to the total public sector per province is available from CBS. However, the public sector in a province consists of more than just the provincial organization as such. Since the amount of employees per province is known, and the total number of employees in the public sector per province is known, this ratio can be used to determine the part of the gas use to be attributed to the province. Subsequently, the emission factor for natural gas use has been applied to determine the CO_2 emission due to natural gas consumption by the provincial organizations.

The use of fossil car fuel by company vehicles is estimated by the number of company vehicles, and the average annual mileage of company vehicles. The number of cars owned by the provincial organizations is not known, but the total number of company vehicles in the public sector can be obtained from CBS. It was possible to make an estimation of the number of company vehicles per province. With the average annual mileage of company vehicles and the emission factor for unknown fuel use, the CO_2 equivalent emissions from fossil car fuel used by provinces was estimated.

Data used:

- Supply of natural gas per branch (SBI2008/NACE Rev 2.0) and per province (CBS, 2018)
- Number of employees (FTE) per province (A&O research, 2017; annual reports provinces; 2018)
- Number of inhabitants per municipality (CBS, 2017)
- Number of employees in the public sector per province (NUTS2) area (LISA, 2018)
- Supply of natural gas per branch (SBI2008/NACE Rev 2.0) and per Province (NUTS2) area (CBS, 2018)
- Emission factor for natural gas (WTW, 1.89 kg CO_2/Nm3 natural gas) (www.co2emissiefactoren.nl)
- Number of company vehicles in the public sector (SBI2008/NACE Rev 2.0) per year (CBS, 2017)
- Number of company vehicles per fuel source (CBS, 2018)
- Average annual mileage per company car and fuel source (CBS, 2018)
- Emission factor for vehicles with unknown fuel source, and weight class (WTW, 0.22 kg CO_2/vehicle kilometer) (www.co2emissiefactoren.nl)

7.2.2 Scope 2

Scope 2 emissions include the indirect GHG emissions from consumption of purchased electricity, heat or steam. Because the heat and steam use per province is unknown, scope 2 will be focused on the use of purchased electricity. As exact figures per province are not known, estimations had to be made using multiple calculation factors to arrive at as exact data as possible.

Electricity use is estimated by the number of employees, and the electricity use per sector per province. The amount of electricity supplied to the total public sector per province is available at CBS. Since the amount of employees per province is known and the total number of employees in the public sector per province is known their ratio can be used to determine the part of electricity use the province is accountable for. This value is used to determine the CO_2 equivalent emission of electricity consumption from the provincial organizations.

Data used:

- Supply of electricity per branch (SBI2008/NACE Rev 2.0) and per province (CBS, 2018)
- Number of employees (FTE) per province(A&O research, 2017; Annual reports provinces)
- Number of inhabitants per municipality (CBS, 2017)
- Number of employees in the public sector per province (NUTS2) area (LISA, 2018)
- Supply of electricity per branch (SBI2008/NACE Rev 2.0) and per province (NUTS2) area (CBS, 2018)
- Emission factor for electricity (WTW, 0.413 kg CO_2/kWh electricity) (www.co2emissiefactoren.nl)

7.2.3 Scope 3

Scope 3 covers all other indirect emissions. Some examples of scope 3 activities prominent in government activities include emissions from employee commuting, business travel, and outsourced contractor activities. The scope 3 emissions per province are unknown, but they can be estimated by the annual spending of provinces (IV3/COFOG).

The IV3 spending database is divided into functions. Each function has its own purpose. Examples of such functions are safety, education or social domain. In total, there are 8 functions and 54 sub-functions. These sub-functions are via a matrix connected with categories. The expense items describe where the money is spent. In this case, only category 3 “Goods and Services” is relevant to calculate the scope 3 emissions. These expenses describe the goods and services that are delivered for a payment, in a hire or purchase construction. 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 all goods with a lifespan greater than one year. Category 3.3 (areal lease) and category 3.4 (social benefits in kind) are not taken in considerations because of the underlying principles. Category 3.5 describes the insourced employees, and 3.8 are other goods and services such as tools, food and other expenses.

The sub-functions and categories have been linked to the IV3/COFOG codes of the production statistics. In this way, it is possible to calculate which part of the provincial expenses has been spend on which sectoral production category. Because only the expenses on goods and services are taken into consideration, this makes the estimation quite specific.

After the establishment of this connection, estimations of the CO_2 equivalent emissions can be made by using the nationwide CO_2/Euro rate per COFOG category (CBS, 2018).
There is one qualifying remark that has to be taken into account in this approach. Unfortunately, there are some remaining expenses on electricity, warmth and gas under scope 3. These should actually be represented in the scope 1 and scope 2 statistics. These are however not separated from other expenses, so it was decided to keep them under scope 3.

For these reasons it is important to note that the results for scope 3 will be slightly overestimated, and for scope 1 and scope 2 slightly underestimated.

Data used:

- provincial expenses per function and category (IV3/COFOG) in the annual account (CBS, 2017, secondary placement)
- Added value based on production per sector (SBI2008/NAVE Rev 2.0) annual nationwide (CBS, 2018)
- CO_2 emissions on national accounts per sector (SBI2008/NAVE Rev 2.0) annual nationwide (CBS, 2018)
- Connection between functions categories and sectors developed by Telos (see Annex 2)

7.3 Data quality

The following data scoring is used to score and improve data quality on provincial organizations.

Table 7.2 Data quality definitions for the Provinces sector

Data quality (highest to lowest)	Description
1	Actual energy consumption, converted to CO_2 eq-emissions using verified emission factors and detailed activity data specific to the type of energy consumed
2	Actual energy consumption, converted to CO_2 eq-emissions using emissions factors for energy from undefined fuel source
3	Modeled regional activity data based on robust assumptions, converted to CO_2 eq-emissions using emissions factors for energy from undefined fuel source
4	Modeled activity data in a country, converted to CO_2 eq-emissions using emissions factors for energy from undefined fuel source
5	Highly modeled activity or uncertain activity data in a country, converted to CO_2 eq-emissions using default emissions factors for energy from undefined fuel source

The CO_2 eq emissions per province are ideally calculated using energy consumption data per client account. When this is not available, other methods have to be used. This of course will increase the uncertainty level of the calculations.

The method used for provinces in this study is based on robust estimations of electricity and natural gas use, converted to CO_2eq emissions using emission factors. For natural gas use, this is a known specific type of energy, but for electricity use, energy comes from undefined sources. This is in compliance with data quality level 3. The scope 3 calculations are based on local actual expenses, and national averages on CO_2 emissions. Therefore, this method is scaled into quality level 3.

7.4 Results

The outcome of the CO_2 footprint of the outstanding NWB Bank loans to provinces at the end of 2019 is given in table 7.3 .

Table 7.3 GHG emissions for the NWB Provinces sector

Source of emission	Scope	CO_2 EQ. (total)		CO_2 EQ. (relative)	Data quality score
		Ton/year	**%**	**Ton/million EUR**	
Direct CO_2-emissies					
Natural gas use	Scope 1	165	1.2%	0.7	3
Fossil car fuel use	Scope 1	25	0.2%	0.1	4
Indirect CO_2 emissions by energy use					
Electricity use	Scope 2	581	4.1%	4.1	3
Other indirect CO_2 emissions					
Purchased goods and services	Scope 3	13,296	94.5%	94.5	3
Total		**14,066**	**100%**	**62.7**	**3**

8 Total GHG emissions of the loan portfolio of the NWB Bank, reporting year 2019

8.1 Coverage of the GHG emission assessment

In summary, table 8.1 shows the overview of outstanding loans per sector and the subcategories and the part covered with GHG emission estimates.

Table 8.1 Total outstanding loans of NWB Bank and part covered in GHG assessment

Sector	Subsector	Total NWB balance sheet	Percentage of total balance sheet	Part covered with GHG emission calculation	
		mln EUR	%	mln EUR	%
Social Housing					
	Total	30,813	64.6%	30,790	99.9%
Water Authorities					
	Total	6,501	13.6%	6,501	100%
Municipalities					
	Total	5,346	11.2%	5,346	100%
Healthcare					
	Total	2,053	4.3%	1,522	74.1%
Provinces					
	Total	225	0.5%	225	100%
Others					
	Organizations	2,441	5.1%	0	0%
	Projects	333	0.7%	0	0%
Total		47,711	100%	44,383	93.0%

The GHG emission estimates according to the PCAF methodology are covering 93% of the NWB Bank loans portfolio. This a very high coverage ratio compared to what other banks in the Netherlands PCAF group have recently reported (PCAF The Netherlands, report 2019; Accounting GHG emissions and taking action: harmonized approach for the financial sector in the Netherlands). Examples are 60% for Rabobank Dutch corporate loans or 69% for Triodos Bank loans and investments.

8.2 Results of the GHG emission calculations in perspective

An overview of total CO_2 equivalence emissions for the outstanding loan portfolio of the NWB Bank is given in table 8.2

Table 8.2 NWB Bank total PCAF based GHG emissions with overview per sector

Sector	Total outstanding loans covered	Attributed emissions	Emission intensity	Data quality score
	mln EUR	**Kton CO_2 eq.**	**(kton CO_2 eq. / billion EUR**	**high quality = 1, low quality = 5**
Social Housing	30,790	1810	58.79	2.5
Water Authorities	6,501	239	36.82	1
Municipalities	5,346	490	91.67	3
Healthcare	1,522	82	54.04	2.5
Provinces	225	14	62.65	3
Others	0	-	-	-
Total	44,383	2636	59.39	2.5

There are some variations to be seen in outcome table 8.2. Municipalities have a relatively high emission intensity, which is mainly due to a high contribution of Scope 3 activities. Water Authorities score relatively low because of the low scope 1 activities. The contribution of natural gas to the total CO_2 emissions of Water Authorities is only 11%.

For the Social Housing sector, Triodos Bank reports[4] an intensity of 42, somewhat lower than found for NWB Bank with a value of 59. This might be because of different customers in the loan list, a different methodology, or a different loaning approach (e.g. project financing vs. balance sheet financing).

Overall, the NWB bank has a emissions intensity over the outstanding loans of 59 Kton CO_2/billion EUR. The data quality score is on average approximately 2.5. This is rather high compared with other PCAF studies carried out in the financial sector[5][6].

[4] https://annual-report-triodos.com/2018/executive-board-report/impact-and-financial-results/the-impact-of-our-finance/decarbonising-the-economy.html
[5] Triodos Bank: Accounting GHG emissions and taking action: harmonized approach for the financial sector in the Netherlands, 2019.
[6] ASN Bank: ASN Bank Carbon Profit and Loss Methodology, January 2017.

Annex A. Coupling SBI codes and IV3 categories for municipalities

Translation:

SBI codes = International system of classifications, NACE codes Rev. 2[7]

IV3 codes = Government expenditure by function, COFOG[8]

Categories

Category	SBI 2e	SBI 1e
L3.1 Soil	68	L
L3.2 Durable goods	68, 77, 45, 41, 42, 43	L, N, G, F
L3.3 Leases of land, waterways or rivers	-	
L3.4.1 Social benefits in kind	-	
L3.5.1 Hired-in personnel	84, 69 & division linkage	M, O
L3.8 Other goods and services	B, C, D, E & division linkage	B, C, D, E

Divisions and sub-items

Divisions and sub-items	SBI 2e	SBI 1e
ADMINISTRATION AND CIVIL AFFAIRS		
Administration	-	-
Civil affairs	-	-
Management other buildings and lands	68	L
Overhead	-	-
Treasury	-	-
Property tax (OZB) on dwellings	-	-
Property tax (OZB) on non-dwellings	-	-
Parking fees	-	-
Other taxes	-	-
General payments and other payments General Municipalities Fund	-	-
Other income and expenditure	-	-
Corporation tax (VpB)	-	-
Mutations of the reserves	-	-
Balance of the account of income and expenditures	-	-
PUBLIC SAFETY		
Crisis control and fire department	84	O

[7] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=NACE_background#Structure_and_coding_of_NACE

[8] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Government_expenditure_by_function_%E2%80%93_COFOG#General_overview

Divisions and sub-items	SBI 2e	SBI 1e
Public order and safety	84	O
TRAFFIC AND PARKING		
Traffic and transport	52, 42	H, F
Parking	-	
Recreational harbors	93	R
Commercial harbors and waterways	42	F
Public transport	42	F
ECONOMIC POLICY AND SUPPORT		
Economic development		K
Commercial infrastructure		F
Business service point and funding schemes		K
Economic promotion		K, R
EDUCATION		
Public primary education		P
Educational accommodation		F, P, L, O
Educational policy and student affairs		P
SPORTS, CULTURE AND RECREATION		
Sports policy and activation policy		R
Sports facilities		R, F
Cultural presentation, production and participation		R
Museums		R
Cultural heritage		R, F
Media		R
Public parks and (open-air) recreation		R
SOCIAL DOMAIN		
Community development and civic participation	52	O, Q, R, L
District teams		O, Q
Income schemes		O, Q
Supported participation		O, Q
Labor participation		O, Q
Individual social support (WMO)		O, Q
Individual services 18+		O, Q

Divisions and sub-items	SBI 2e	SBI 1e
Individual services 18-		O, Q
Escalated care 18+		O, Q
Escalated care 18-		O, Q
PUBLIC HEALTH AND ENVIRONMENTAL PROTECTION		
Public health		Q
Sewage system		F, E
Waste		E
Environmental management		E
Cemeteries and crematoria	96	S
URBAN PLANNING, PUBLIC HOUSING AND CONSTRUCTION		
Spatial planning		F, M
Land development (non-business areas)		F, L
Public housing and construction		F

Annex B. Coupling SBI codes and IV3 categories for provinces

Translation:

SBI codes = International system of classifications, NACE codes Rev. 2[9]

IV3 codes = Government expenditure by function, COFOG[10]

Categories

Category	SBI 2e	SBI 1e
L3.1 Soil	68	L
L3.2 Durable goods	68, 77, 45, 41, 42, 43	L, N, G, F
L3.3 Leases of land, waterways or rivers	-	
L3.4.1 Social benefits in kind	-	
L3.5.1 Hired-in personnel	84, 69 & division linkage	M, O
L3.8 Other goods and services	B, C, D, E & division linkage	B, C, D, E

Divisions and sub-items

code	Divisions and sub-items	
0.1	General payments General Provincial Fund	-
0.2	Revenues provincial taxes	-
0.3	(Money) loans	-
0.4	Participations	-
0.5	Other income and expenditure	-
0.6	Overhead	-
0.7	Corporation tax (VpB)	-
0.8	Mutations of the reserves	-
0.9	Balance of the account of income and expenditures	-
1.1	Provincial states	-
1.2	Provincial Executive	-
1.3	Cabinet Affairs	-
1.4	Administrative organization	-
1.5	Inter-administrative supervision of the region	-
1.6	Public order and safety	-
1.9	Administration, other	-
2.1	(Country) roads	F
2.2	Waterways	F
2.3	Public transport	F
2.9	Traffic and transport, other	H, F

[9] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=NACE_background#Structure_and_coding_of_NACE

[10] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Government_expenditure_by_function_%E2%80%93_COFOG#General_overview

code	Divisions and sub-items	
3.1	Flood defenses	F, E
3.2	Quantity surface water	E
3.3	Quantity ground water	E
3.4	Quality surface water	E
3.5	Quality ground water	E
3.9	Water, other..	E
4.1	Soil protection	F, J
4.2	Air pollution	J
4.3	Noise pollution	J
4.4	Licensing and enforcement	J
4.5	Soil preparation	F
4.6	Durability	J
4.9	Environment, other	J
5.1	Nature development	L
5.2	Nature reserve management	F
5.3	Flora and fauna management	F
5.9	Nature, other	F, J
6.1	Agricultural matters	A
6.2	Logistics	H
6.3	Knowledge and innovation	P
6.4	Recreation and tourism	R, F
6.9	Regional economy, other	R
7.1	Culture	R, F
7.2	Society	R
7.9	Culture and society, other	R, Q
8.1	Spatial planning	M
8.2	Housing	M
8.3	Urban renewal	M
8.9	Space, other	M

telos brabants centrum voor duurzame ontwikkeling

HET PON

TILBURG UNIVERSITY

Official Partner Tilburg University

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