



Current CO₂e measurement methods in the Dutch financial sector

Description of the current methods for measuring the CO₂e impact of relevant financing and investments

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*The contacts at KPMG for this report
are:*

Marco Frikkee
KPMG Sustainability
Partner, Amstelveen
Tel: +31 (0)20 656 7239

Frikkee.Marco@kpmg.nl

Michiel Evers
KPMG Sustainability
Senior Consultant, Amstelveen
Tel: +31 (0)6 1011 4277

Evers.Michiel@kpmg.nl

Introduction

The Paris Agreement and the role of the financial sector

In order to reduce the most harmful effects of climate change, it is important to limit global warming to less than two degrees Celsius by drastically reducing greenhouse gas (hereinafter: CO₂e) emissions. On the basis of the Paris Climate Agreement (hereinafter: the Paris Agreement), the Netherlands has established in its Climate Act that by 2030, CO₂e emissions in our country must be reduced by 49% compared to 1990, to eventually achieve a reduction of 95% by 2050¹. The role of the Dutch financial sector in combating climate change is not to be underestimated: through financing and investments, it can impact the CO₂e emissions of the real economy. An important instrument in this respect is measuring the CO₂e emissions of its (potential) investment and credit portfolios. Meanwhile in the financial world, various measuring methods are being used, which may result in challenges with regard to the

comparability of the outcomes. Therefore, financial institutions further develop these CO₂e impact measurement methods in close cooperation. Internationally, Dutch financial institutions have also played an important role in the development and standardization of these methods.

The Climate Commitment of the Dutch financial sector

In 2019, 53 financial institutions agreed to report on the CO₂e impact of their relevant financing and investments in *The Climate Commitment of the Financial Sector* (hereinafter: the Climate Commitment) from the 2020 financial year onwards. In addition, by 2022 at the latest, they will have action plans in place explaining the steps they are taking for all of their relevant financing and investments in order to contribute to the goals of the Paris Agreement. This could entail a combination of approaches, including CO₂e reduction targets for the portfolio where

possible, financing of CO₂e reduction projects and engagement.

Objective of this report

This report describes the current status of measuring CO₂e impact in the financial sector. In this respect, CO₂e impact can refer to both CO₂e emissions and CO₂e intensity as will be explained later in this report.

The report provides a brief description of the main initiatives, methods and indicators used by financial institutions to measure CO₂e impact and the differences between these methods. This report does not provide an overview of other initiatives in the field of climate-related measurement methods, such as those relating to climate risks or engagement.



Summary

Management summary

In order to effectively steer on the CO₂e impact of financial institutions, gaining insight into the CO₂e contribution of financing and investments is the first step. More than half of the financial institutions that have signed the Climate Commitment already report to a greater or lesser extent on the CO₂e impact of their relevant financing and investments.

For example, there are currently several initiatives aimed at measuring, managing and reporting CO₂e, most of which focus on the methods of the Partnership for Carbon Accounting Financials (PCAF)² and the Paris Agreement Capital Transition Assessment (PACTA) method³. Dutch financial institutions have played an important role in the development of both these international standards. Although most financial institutions use the PCAF method, both methods can be applied complementarily. However, the purposes for which they are used may differ.

The PCAF method is aimed at measuring CO₂e per type of asset and the PACTA method is sector-specific and aimed at measuring the extent to which the technology mix and emissions of these sectors are in line with the Paris Agreement.

At portfolio level, for example, the PCAF method is used as an indicator for the absolute CO₂e footprint and the PACTA method for the CO₂e

intensity. These indicators provide different insights and can therefore be used side-by-side. These methods, however valuable, are still faced by a number of challenges for measuring and managing CO₂e impact:

- **Methodological differences between and within CO₂e measurement methods:** Different methods offer different perspectives on CO₂e impact. The methods differ in their application of indicators, attribution systems, the scope of measured emissions and standardization schemes.
- **Limited data quality and data availability:** Financial institutions use data suppliers that collect data (often based on estimates) from a large number of companies to determine the CO₂e impact of their portfolios. The availability of this data is delayed and the coverage and quality of the data varies considerably per sector and per asset class. There are also differences in the estimates of CO₂e emissions between data suppliers.
- **Efforts are not always reflected in the CO₂e impact:** The results of certain management instruments, such as engagement, are often only visible in the CO₂e impact after a period of time. This is because, in order to impact the real economy, financial institutions can choose

to include or keep CO₂e-intensive assets in their portfolios and encourage companies to reduce their CO₂e intensity through, for example, engagement. The results of these efforts often are only visible in the CO₂e impact after a few years.

Current climate initiatives and measurement methods in the Dutch financial sector

Increasing demand for CO₂e information

Stakeholders are increasingly asking financial institutions to report on the climate impact of relevant financing and investments, focusing in particular on the CO₂e impact:

The Task Force on Climate-related Financial Disclosures (TCFD) requires asset owners and asset managers to report on the CO₂e impact of their investment and loan portfolios in order to better assess the impact of climate change on business operations.

Other initiatives, such as the *Principles for Responsible Banking* and the *Carbon Disclosure Project* (CDP), also require participating institutions to be transparent about the CO₂e impact of their managed portfolios.

At the European level, both the consultation document of the update of the *Non-Financial Reporting Directive* (NFRD)²² and the consultation document of the *Sustainable Finance Disclosure Regulation* (SFDR) offer concrete indicators for financial institutions on the basis of which they must report on the CO₂e impact.

Dutch financial institutions play an important role in several leading international initiatives

Financial institutions participate in a wide range of activities to reduce the negative climate impact of financing and investments. This report

focuses in particular on initiatives aimed at measuring financed CO₂e emissions and setting targets in this area.

For some time now, several Dutch financial institutions have been developing methodologies for measuring CO₂e emissions and setting targets; as mentioned above, they play an important role in various international initiatives, such as PCAF and PACTA.

Measuring is important but complex

To be able to effectively steer on the climate impact of financial institutions, the CO₂e contribution of financing and investments has to be measured (first). In recent years, many initiatives were launched in relation to the development of such methodologies with, as a result, a corresponding increase in the attention for the harmonization between these initiatives.

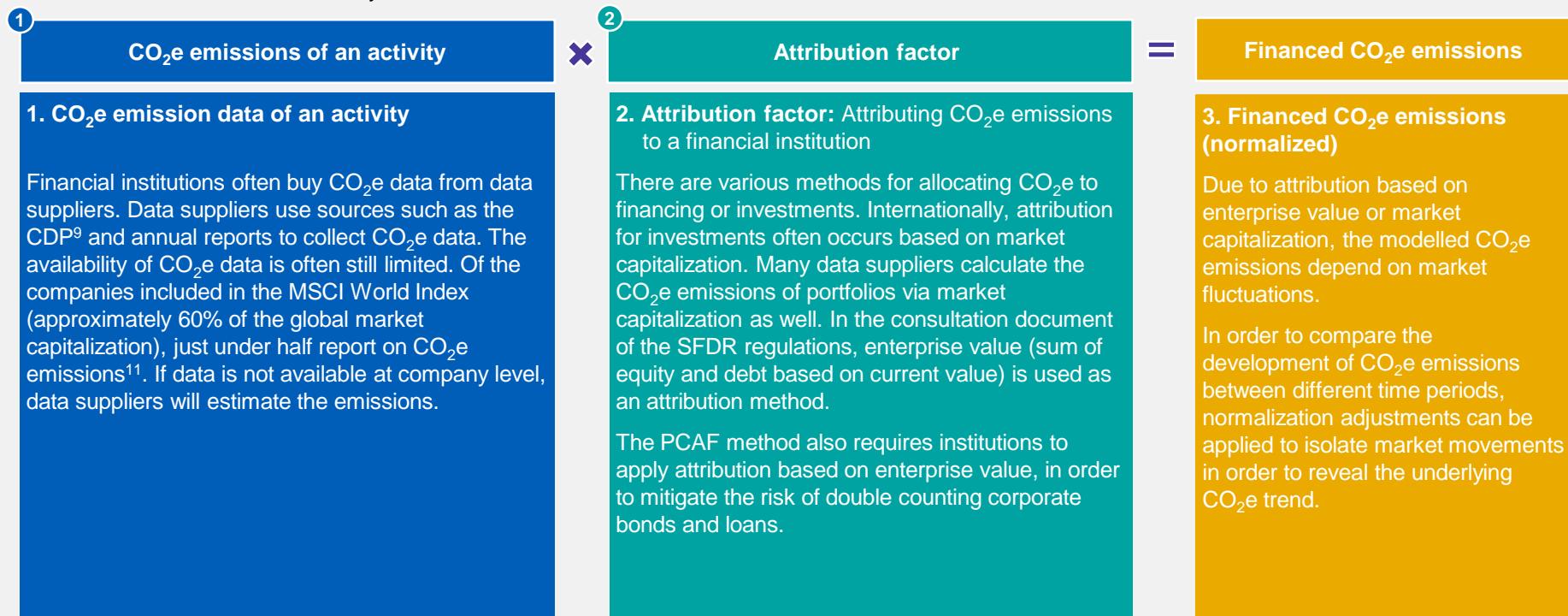
Measuring the CO₂e contribution of financing and investments is a complex task. Such CO₂e contribution is not measured directly by financial institutions, but it is allocated, whereby a share of the CO₂e emissions of the assets in the financing or investment portfolio is attributed to the financial institution. Limited availability of data on the CO₂e emissions of underlying assets is a major challenge in this respect. To be able to effectively steer on the CO₂e impact, one has to gain insight into these emissions. There are still steps to be taken in this area.

Financial institutions usually report the CO₂e impact based on methods developed by external initiatives or with in-house-developed climate impact systems that are often inspired by such external initiatives. An overview of current measurement methods and initiatives is presented on pages 7 and 8.

Simplified overview of a CO₂e calculation for financial institutions

Calculating CO₂e emissions from financing and investments (example based on PCAF)

Simplified, CO₂e emissions from financing and investments are calculated by allocating a share of the CO₂e emissions of the financed activity to the financing or investment. There are several ways to do this.



(Inter)national developments with regard to CO₂e impact measurement methods

An overview of initiatives aimed at measuring and harmonizing the financed CO₂e emissions is provided on the right. A distinction can be made between initiatives that are primarily focused on:

- measuring CO₂e emissions from portfolios (e.g. PCAF);
- measuring the extent to which portfolios are in line with the Paris Agreement (e.g. PACTA and SBT);
- sector-specific measurement methods including transition paths based on several scenarios;
- testing and harmonizing different measurement methods, such as the Institutional Investors Group for Climate Change (IIGCC) and the UN-Convened Net-Zero Asset Owner Alliance.

These initiatives often use each other's work and are frequently updated. For example, the recently published draft version of *Financial Sector – Science Based Target Guidance* uses both PCAF and PACTA. This creates a certain degree of harmonization between initiatives.

The PCAF and PACTA methods are already used in the Netherlands and internationally by a large number of institutions. This report therefore focuses on PCAF and PACTA as CO₂e impact measurement methods. As mentioned above, these methods can be used complementarily.

Overview of measurement-oriented initiatives

Name		Description	Focus on
Initiatives aimed at developing measurement methods on CO ₂ e impact			
Partnership for Carbon Accounting Financials (PCAF) ²		A harmonized standard to measure the CO ₂ e emissions of different types of assets.	✓ Decarbonization (forward looking)
Paris Agreement Capital Transition Assessment (PACTA) ³		A method for measuring whether financing and investments are in line with transition paths aligned with the Paris Agreement.	✓ (in development)
Science Based Targets for Financial Institutions (SBT) ⁴		A method to develop objectives for relevant financing and investments in line with the Paris Agreement.	✓ (in development)
Initiatives aimed at developing sector-specific measurement methods on CO ₂ e impact			
Poseidon Principles ⁷		A method for measuring the alignment of shipping portfolios with different decarbonization scenarios.	✓
Carbon Risk Real Estate Monitor tool ⁸		A method for measuring the science-based decarbonization trajectories for European commercial real estate portfolios.	✓
Initiatives aimed at testing and harmonizing measurement methods			
IIGCC Paris Aligned Investment Initiative ⁵		Initiative to identify methods to help align portfolios based on the objectives of the Paris Agreement.	✓ (in development)
UN-Convened Net-Zero Asset Owner Alliance ⁶		An initiative to bring the emissions of portfolios to 'net-zero' by 2050, including the measurement of these emissions.	✓ (in development)

The above list is not exhaustive but includes the main methods used by Dutch financial institutions for measuring and setting CO₂e impact targets.

Several indicators for measuring CO₂e impact

There are several indicators for measuring CO₂e impact. These indicators provide different insights and can be used complementarily. The main differences are:

— Type of CO₂e indicator: absolute versus relative emissions

Absolute CO₂e emissions are the actual or total emissions. Relative emissions are emissions per euro (or an alternative unit). Absolute emissions provide insight into the contribution of portfolios to climate change, whereas relative emissions provide insight into the efficiency of portfolios.

— Difference in perspective of the CO₂e indicator

One can distinguish indicators for (i) CO₂e emissions and the efficiency of portfolios and (ii) the efficiency of financed activities. PCAF measures the absolute emissions and efficiency of portfolios through the carbon footprint. PACTA looks at the efficiency of financed activities per sector and compares these with different transition scenarios in order to determine the degree of alignment with the Paris Agreement.

— Difference in scope of CO₂e measurements

The emissions of financial institutions are calculated based on the perspective of the financed activity, with scope 1: including the direct emissions of the activity; scope 2: the indirect emissions from purchased electricity and heat; and scope 3: the other indirect emissions from the value chain (e.g. emissions from suppliers). Many financial institutions calculate the CO₂e impact on the basis of scope 1 and 2 emissions. The availability and quality of data for scope 3 is still limited.

The PCAF and PACTA methods are described in more detail on pages 13 to 16.

Indicators of CO ₂ e impact	Description	Indicator	Recommended by*	Part of	
				PCAF	PACTA
Indicators of CO₂e emissions from portfolios					
Total/absolute CO ₂ e emissions	Total CO ₂ e footprint of the portfolio	CO ₂ e	● ●	✓	
CO ₂ e footprint	Normalized CO ₂ e footprint per euro invested	CO ₂ e / € invested	● ●	✓	
CO ₂ e intensity	Volume of CO ₂ e emissions per euro revenue	CO ₂ e / € revenue of companies in which invested	● ●		
CO ₂ e intensity by portfolio weight	CO ₂ e intensity by portfolio weight	CO ₂ e / € turnover of companies in which invested	● ● ●		
CO ₂ e intensity by portfolio weight (sector-specific)	Sector-specific indicators of financed activities	CO ₂ e / MWh CO ₂ e / km CO ₂ e / m ² CO ₂ e / tonne ...			✓

* The TCFD, the NFRD and the SFDR provide indicators for financial institutions to be able to report, among other things, CO₂e impact. There are currently no prescribed indicators on CO₂e impact for financial institutions.

- TCFD recommendations
- NFRD (supplement on reporting climate-related information)
- SFDR (consultation)

More than half of financial institutions report the CO₂e impact

The current status of reporting

The 53 financial institutions that signed the Climate Commitment have agreed to report the CO₂e impact of their relevant financing and investments from the 2020 fiscal year onwards. Based on public information, it appears that a small majority already reported on the CO₂e impact in 2019, with PCAF being the most referenced method.

Coverage of the reports

There is still a lot of variation between these institutions with regard to the extent to which their reports provide insight into the CO₂e impact of all their relevant financing and investments. In addition, the reports of institutions that have been reporting for a longer period of time are often more extensive than those that have only recently started to do so.

The scope of reporting usually concerns listed shares. Government bonds, private equity and debt, mortgages and real estate are often not yet included in the CO₂e reporting.

The most commonly used method

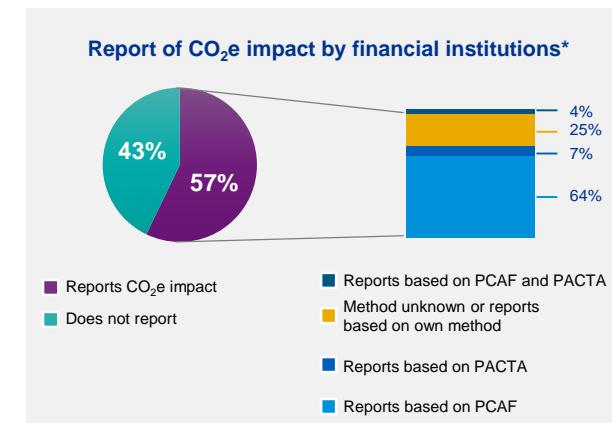
Around 68% of the institutions already reporting on CO₂e impact do so on the basis of the PCAF method. However, not all institutions that report on the basis of PCAF fully comply with the recommendations of PCAF. For example, some institutions use a different attribution system or other normalization method, resulting in difficulties in the comparability between PCAF-based outcomes between institutions.

PCAF is used by all types of financial institutions: pension funds, banks, asset managers and insurers.

The Dutch financial institutions that have joined PACTA are ING and ABN AMRO. Internationally, PACTA has a lot of support among 17 international banks such as Barclays, BBVA, BNP Paribas, Société Générale and UBS.

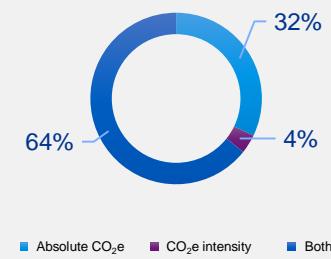
Indicators in reports

As indicated on the previous page, financial institutions use different types of indicators to measure CO₂e impact. Most financial institutions choose a combination of absolute and relative indicators.



Source: KPMG.

Type of CO₂e indicators used by reporting financial institutions*



Source: KPMG.

*The above data is based on annual reports and public sources such as the PCAF website and contains estimates and assumptions (e.g. for international institutions for which the Climate Commitment is signed only for Dutch activities).

Moving towards better information for reporting of and steering on CO₂e impact

1. Efforts are not always reflected in the CO₂e impact

Through financing and investments, financial institutions can put pressure on the real economy to bring CO₂e emissions in line with the Paris Agreement. There are opportunities for managing the CO₂e impact of portfolios, using engagement, but also by disinvestment. The development of the CO₂e impact of the portfolios of financial institutions is therefore an important indicator of the success of their efforts, but this in itself can also be misleading.

If institutions manage the CO₂e impact by selling CO₂e-intensive assets, there is a sharp decline in CO₂e impact on paper, but no difference in the real economy.

That is why financial institutions can also choose to increase exposure to CO₂e-intensive asset classes/sectors (e.g. homes built before 1950) in order to exert more influence. In the short term, this would result in an increase in the CO₂e impact, while in the longer term, the institution could make targeted efforts to reduce the CO₂e impact in the real economy through its portfolio.

When evaluating the development of the CO₂e impact of financial institutions, it is therefore always necessary to look at policies and steering instruments of these institutions in order to reach an accurate conclusion about the effectiveness of the policy.

2. Comparability of CO₂e levels between financial institutions still faces a number of challenges

Dutch financial institutions are striving for harmonisation and comparability of CO₂e emission measurement methods for better comparability of outcomes between financial institutions. At the moment, this comparability is limited, due to:

a. Methodological differences between and within CO₂e impact measurement methods

There are several measurement systems and the comparability between these methods is (still) limited. PCAF and PACTA offer different perspectives on the CO₂e impact of portfolios of financial institutions, and also use different indicators:

- Difference in **indicators**: There are various indicators for CO₂e impact. PCAF measures the absolute and relative CO₂e emissions of asset classes, while PACTA looks at sector-specific indicators in alignment with the Paris Agreement. These different indicators serve different purposes and can be used in a complementary way for effective measurement and of the CO₂e impact. However, as financial institutions do not report the same indicators, it is not possible to compare and aggregate CO₂e indicators between financial institutions.

- Difference in **attribution**: CO₂e emissions are allocated to investments and loans in different ways. There is currently no standard for

attribution between CO₂e impact measurement methods, which limits the comparability of outcomes. For example, PCAF uses the enterprise value (sum of equity and debt based on current value) to attribute emissions to different types of assets; internationally, market capitalisation (market value) is often used. Other measurement methods, such as PACTA, use a different attribution method. There are also differences in attribution methods for other asset classes, such as government bonds.

- Difference in **normalisation schedules**: Some institutions use normalisation schedules to correct the impact of fluctuations in the market capitalisation of companies in its portfolio on the CO₂e emissions^{11, 12}.

- Difference in **measured emissions**: Most financial institutions report the scope 1 and scope 2 emissions: the direct emissions of the activity and the indirect emissions from purchased electricity and heat. Increasingly, financial institutions are also asked to report the scope 3 emissions of relevant financing and investments, i.e. the other indirect emissions from the value chain. However, the availability of reliable asset-specific data at scope 3 level is still very limited and the risk of double counting of scope 3 emissions is high.

Moving towards better information for reporting of and steering on CO₂e impact

b. Limited data availability and quality

The availability and quality of data is essential for reliable outcomes and relevant insights for decision making. Data availability, however, poses considerable challenges for a number of sectors and asset classes. Furthermore, there are significant differences between the estimation methods used by the various data suppliers:

— **Data availability:** Granular CO₂e data for a number of sectors and asset classes are often of poor quality or unavailable, making it difficult to obtain comparable results that are suitable for decision making and management. For example, CO₂e data on government loans from countries outside the EU are rarely available, which makes it difficult to calculate the CO₂e emissions of large fixed-income portfolios. The same applies to data availability for real estate, private equity, private debt and private loans. In the absence of sufficient data, institutions that apply PCAF can, for example, use the average emission intensity of sectors by monitoring the average sector intensity instead of the actual asset-specific emissions, which means that decarbonization efforts are not visible in the CO₂e impact of the institution¹⁴.

— Differences between data suppliers:

Financial institutions use data suppliers that provide CO₂e data on the CO₂e impact of financing and investments. If no data are available at company level, data suppliers estimate these emissions. Each supplier uses its own methodology to estimate emissions, often based on factors such as industry, production, number of employees, location and revenue. This leads to apparent differences in estimates of CO₂e emissions between data providers^{10, 12}.

— CO₂e data delay:

Data suppliers use data reported by companies in annual reports or to the CDP. Current data for the reporting year are usually not or not timely available, so financial institutions use CO₂e data that are at least one year old. For government bonds, there is even a longer delay.



Appendices

1. PCAF & PACTA in more detail
2. Sources

Appendix 1:

79 institutions with a total of over \$13.8 trillion in assets participate in PCAF

Context

The Partnership for Carbon Accounting Financials (PCAF) initiative was launched in 2015 in the run-up to the COP21². The aim of the initiative is to develop a harmonized standard to measure CO₂e emissions from financing and investments. PCAF is based on the *Greenhouse Gas Protocol of the World Resource Institute* and the *World Business Council for Sustainable Development*.

Nineteen Dutch financial institutions participate in PCAF*. The method has received international attention and is now also applied in the US and Canada. PCAF has 79 participating institutions with a total of over \$13.8 trillion in assets^{13,15}.

Scope

PCAF is a standard used to measure the direct and indirect emissions of financing and investments. PCAF has developed methods to calculate CO₂e emissions for a number of asset classes.

PCAF enables institutions to calculate both the total CO₂e emissions (absolute CO₂e emissions) and the CO₂e footprint (relative CO₂e emissions) of portfolios.

PCAF contains a detailed description for:

- government bonds;
- listed shares;
- project financing;

- mortgages;
- commercial real estate;
- corporate bonds;
- corporate loans/SME loans;
- indirect investments;
- loans for motor vehicles.

By aggregating the financed emissions over these asset classes, PCAF offers a method to calculate the CO₂e impact of an entire investment or loan portfolio.

Further developments

The PCAF methodology is continuously being developed, further specifying the methods for current asset classes, developing those for new asset classes and working towards further harmonization.

In addition, PCAF is working on improving data availability and quality and on an approach to develop (science-based) targets in line with the Paris Agreement, in collaboration with the RMI Center for Climate-Aligned Finance¹¹.

Example: CO₂e emissions of the loan book

ABN AMRO CO₂e emissions from the loan book

	2019	2018	Delta
Agriculture (A)	833	1,012	(179)
Minerals (B)	3,016	3,200	(284)
Industry (C)	3,039	3,417	(378)
Utilities (D)	815	787	48
Water distribution (E)	142	138	6
Construction (F)	142	197	(55)
Retail (G)	7,204	7,691	(487)
Transport (H)	6,762	7,386	(604)
Leisure (I)	38	36	2
Information and communication (J)	221	227	(6)
Financial Services (K)*	18	20	(2)
Real estate (L)	120	158	(38)
Scientific and technical activities (M)	79	57	22
Administrative services (N)	249	276	(27)
Regional administration (O)	101	116	(14)
Education (P)	21	25	(3)
Healthcare (Q)	139	184	(45)
Recreation (R)	45	51	(6)
Other services (S)	13	28	(15)
Activities of households as employers (T)	0	0	—
Extraterritorial organisations (U)*	4	2	1
No sector	2,010	1,155	855
Total kton CO ₂	25,111	26,319	(1,208)

* Excluding commercial real estate and real estate for own use by clients.

Source: ABN AMRO Non-financial data & Engagement 2019¹⁶

- ABN AMRO has been reporting on the CO₂e impact of the entire loan book at NACE sector level since 2018.
- The calculation is based on:
 - average CO₂e emissions by NACE sector;
 - loans by NACE sector.

²ASR, ABN AMRO, Achmea, ACTIAM, APG, ASN Bank, De Volksbank, BNG Bank, FMO, MN, NIBC Holding NV, NN Group, NWB, Rabobank, Robeco, van Lanschot Kempen, Triodos Bank, PME, PMT.

Appendix 1:

Example of the application of PCAF



ABP: Using PCAF to measure the CO₂e emissions of the investment portfolio

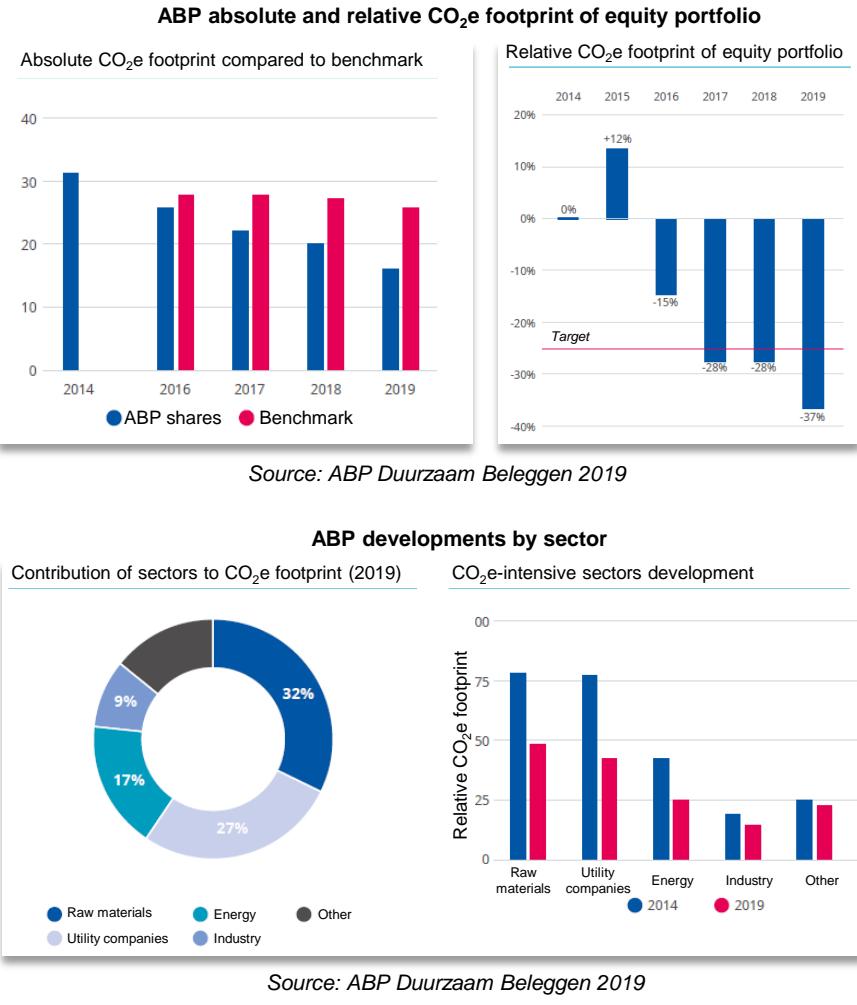
PCAF at ABP^{17,18}

Pension fund ABP has disclosed the CO₂e emissions of its investment portfolio since 2015. ABP calculates the emissions from investments in equities and will in future also report on other asset classes, such as bonds and real estate¹⁷. Their analysis gives an impression of the aggregated absolute CO₂e emissions of all equity investments.

Highlight: Trend analysis CO₂e footprint and sectors

ABP focuses on reducing CO₂e emissions and, for this purpose, uses the relative CO₂e emissions. This is how ABP can analyze trends in CO₂e indicators, such as:

- absolute CO₂e emissions compared to a benchmark;
- which sectors contribute the most to CO₂e emissions;
- reduction in relative CO₂e emissions of companies per euro invested, which can be attributed to a reduction in emissions by companies in the portfolio;
- developments in relative CO₂e footprint in CO₂e-intensive sectors.



Appendix 1:

PACTA has 17 international banks with a total of over \$15 trillion in assets

Context

The Paris Agreement Capital Transition Assessment (PACTA) method has been developed by the 2°C Investing Initiative¹⁹. This method focuses on the technological shifts required in CO₂e-intensive sectors to limit global warming to 2°C. It assesses a financial institution's investments in various technologies – directly or indirectly – against forecasts of the required changes in this technology mix in order to keep global warming well below 2°C. PACTA uses detailed asset-specific production and capacity data for this analysis. Internationally, PACTA has gained considerable momentum. Since its launch in 2018, 17 international banks with more than €15 trillion in assets have adopted PACTA.

Scope

The PACTA method does not measure the CO₂e intensity of a portfolio, such as PCAF, but the CO₂e intensity of activities in the portfolio compared to the sector and with a <2°C climate scenario.

PACTA covers the following sectors, which are responsible for approximately 75% of the global direct and indirect emissions²¹:

- Oil & gas;
- Coal;
- Electricity;

- Automotive;
- Steel;
- Cement;
- Shipping;
- Aviation.

For each sector, the technological changes needed to bring them in line with the Paris Agreement are provided. CO₂e intensity is measured for each sector using a sector-specific indicator, for example:

- Electricity: CO₂e per unit of electricity generated;
- Automotive: CO₂e per km of automobile manufacturers' production mix.

The CO₂e intensity per sector is benchmarked against a climate scenario, such as an energy transition scenario of the International Energy Agency.

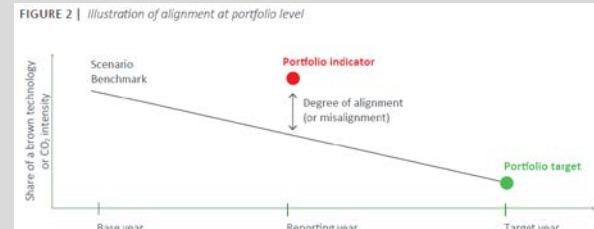
Further developments

The PACTA method is currently being tested by a number of financial institutions, such as AXA, BNP Paribas, Barclays, Société Générale and, from the Netherlands, ING and ABN AMRO.

Meanwhile, PACTA continues to search for further solutions for collecting consistent emission data at customer level.

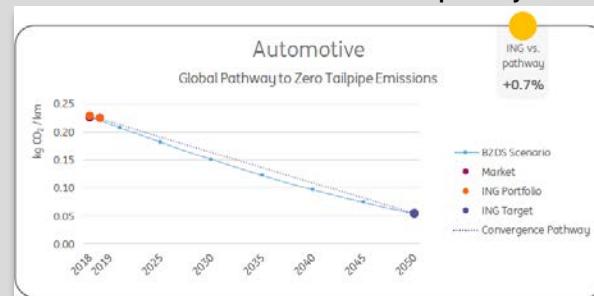
Example

Illustration of portfolio alignment



Source: Credit Portfolio Alignment²⁰

ING automobile decarbonisation pathway



Source: ING Terra Progress Report 2020²¹

Appendix 1:

Example of the application of PACTA

ING: PACTA for measuring 'climate alignment' of portfolios in CO₂e-intensive sectors

PACTA at ING²¹

ING uses the 'Terra Approach', mainly based on the PACTA method and Science Based Target's Sectoral Decarbonisation Approach. In this approach each sector has its own transition pathway or 'technology roadmap' to contribute to a low-carbon world adhering to the agreed below two degrees of global warming by 2100.

Highlight: The Climate Alignment Dashboard

The Climate Alignment Dashboard developed by ING shows to what extent the CO₂e intensity of a sector is aligned with the objectives of the Paris Agreement and provides insight into:

- the **CO₂e intensity** per sector of the portfolio compared to the market and a relevant climate scenario;
- the **climate alignment target** by sector;
- The **decarbonization pathway** by sector.

Benchmarking the performance of ING's investment portfolio against the market and against a climate scenario provides insight into how the portfolio can be further decarbonized and provides insight into ING's performance in this area.

Methodological challenges

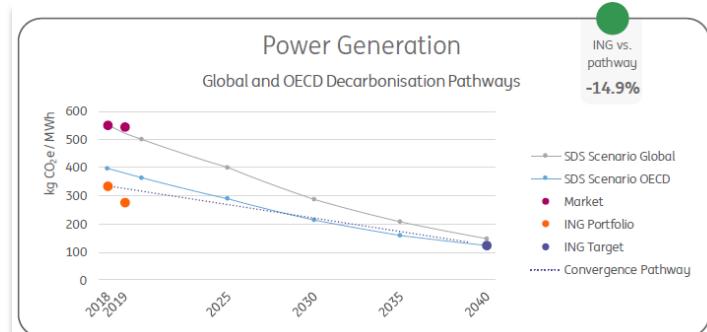
- Limited availability and reliability of data: PACTA is committed to achieving further improvements in the areas of the availability and reliability of data.

Terra sector-specific measurement methods, indicators and scenarios

Sector	Measurement methodology	Target-setting methodology	Scenario	Primary output	Reporting metric
Power generation	PACTA	PACTA	IEA (WEO) SDS 2018	Technology mix	kg CO ₂ e / MWh
Fossil fuels	ING portfolio / revenue segmentation ²⁹	2011 / Katowice Banks	IEA (WEO) SDS 2019	Absolute € G/S	Absolute € G/S
Commercial real estate (NL)	Delta Plan	Paris-proof method	Plan bureau voor de leefomgeving (PBL), derivative of the Paris Agreement	EPC label distribution/ estimated consumption data	kg CO ₂ / m ²
Residential real estate (NL/DE)	PCAF	SDA (SBTi)	IEA (ETP) B2DS 2017	EPC label distribution/ estimated consumption data	kg CO ₂ / m ²
Cement	PACTA	SDA (SBTi)	IEA (ETP) B2DS 2017	CO ₂ intensity per unit of production	t CO ₂ / t cement
Steel	PACTA	SDA (SBTi)	IEA (ETP) B2DS 2017	CO ₂ intensity per unit of production	kg CO ₂ / t Steel
Automotive	PACTA	PACTA	IEA (ETP) B2DS 2015 (retirement figures) & 2017	Technology mix	kg CO ₂ / km
Aviation	PACTA	SDA (SBTi)	IEA (ETP) B2DS 2017	CO ₂ intensity per passenger km	g CO ₂ / pkm
Shipping	UMAS - FUSE / Poseidon Principles	Poseidon Principles	IMO 2050 ambition	CO ₂ intensity per tonne nautical mile	kg CO ₂ / nm

Source: ING Terra Progress Report 2020

Electricity decarbonization pathway



Source: ING Terra Progress Report 2020



Appendix 2: Sources

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Contacts

Marco Frikkee

KPMG Sustainability

Partner, Amstelveen

Tel: +31 (0)20 656 7239

Frikkee.Marco@kpmg.nl

Michiel Evers

KPMG Sustainability

Senior Consultant, Amstelveen

Tel: +31 (0)6 1011 4277

Evers.Michiel@kpmg.nl



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