

# How do we measure the CO<sub>2</sub> footprint of our investments?

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APG

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**CO<sub>2</sub> emissions are a major contributor to global warming. It is therefore imperative to significantly reduce global CO<sub>2</sub> emissions, in line with the Paris Climate Agreement. In this document we explain how APG measures the CO<sub>2</sub> footprint of its investments.**

**APG has been measuring the CO<sub>2</sub> footprint of its investments in listed equities since 2013. In the Dutch Climate Agreement, pension funds and asset managers have agreed to disclose the CO<sub>2</sub> footprint of relevant investments on an annual basis. Since 2020, APG also discloses the CO<sub>2</sub> footprint of its investments in corporate bonds, real estate, and private equity. Currently, we report the CO<sub>2</sub> footprint of 57% of the portfolio.**

**In 2022, all our fund clients set new climate targets for 2030, including a 50% absolute reduction target for the CO<sub>2</sub> footprint of the listed equity and credits portfolios.**

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## Measuring the CO<sub>2</sub> footprint

APG calculates the CO<sub>2</sub> footprint of relevant asset classes according to the Global GHG Accounting and Reporting Standard for the Financial Industry, developed by [PCAF](#). The CO<sub>2</sub> footprint is – with a few exceptions – calculated based on the positions of companies as of December 31, 2022. Due to data processes and validation, it takes

some time before emissions reported by companies are available. The calculation of the CO<sub>2</sub> footprint in 2022 is therefore based on company emissions reported in the financial year 2021.

### CO<sub>2</sub> footprint (scope 1 en 2)<sup>1</sup> per asset class

	Invested assets (€ Mio)	Assets covered (%)	Absolute footprint (tCO <sub>2</sub> e)*	Relative footprint (tCO <sub>2</sub> e/€ Mio)	Data quality indicator <sup>2</sup>
Listed equity	144,664	100%	5,856,205	41	1.7
- developed markets	108,686	100%	3,751,082	35	1.7
- emerging markets	35,978	100%	2,105,122	59	1.7
Credits	53,904	99%	3,748,440	72	2.9
- of which related to SDG-7	2,842	99%	686,112	276	2.2
Real estate	51,649	100%	3,227,194	62	3.2
Private equity	48,517	100%	1,353,160	29	5.0
<b>CO<sub>2</sub> footprint (scope 1 en 2) per asset class</b>	<b>298,734</b>	<b>99%</b>	<b>14,184,998</b>	<b>47</b>	<b>2.7</b>
Other investments	218,008	not calculated	not calculated	not calculated	not applicable
<b>Total</b>	<b>516,742</b>	<b>57.2%</b>			

<sup>1</sup> Real estate includes scope 3 emissions (related to tenant energy use).

<sup>2</sup> The data quality indicator assesses data on a scale 1 (highest quality) to 5 (lowest quality). The indicator is weighted by assets invested. A detailed explanation can be found on page 7.

## CO<sub>2</sub> footprint (scope 1 en 2) per sector<sup>3</sup>

	Invested assets (€ Mio)	Assets covered (%)	Absolute footprint (tCO <sub>2</sub> e)	Relative footprint (tCO <sub>2</sub> e/€ Mio)	Data quality indicator
Communication services	17,150	99%	115,201	7	2.3
Consumer discretionary	24,752	100%	388,615	16	2.6
Consumer staples	15,645	100%	439,547	28	2.1
Energy	3,052	100%	646,729	212	3.2
Financials	56,598	100%	120,763	2	2.7
Health care	31,180	100%	149,484	5	2.7
Industrials <sup>4</sup>	25,449	100%	1,705,563	67	2.7
Information Technology	45,416	100%	359,173	8	2.7
Materials <sup>5</sup>	11,239	100%	2,803,930	250	2.2
Real estate	56,507	100%	33,513	1	3.1
Utilities	8,896	100%	4,188,440	488	2.0
<b>Total</b>	<b>295,883</b>	<b>100%</b>	<b>10,950,958</b>	<b>37</b>	<b>2.7</b>

<sup>3</sup> This includes the assets classes Listed equity, Credits, Real estate and Private Equity and does not include investments that cannot be associated with a specific sector.

<sup>4</sup> This sector includes transportation.

<sup>5</sup> This sector includes mining.

## Scope of relevant asset classes

APG strives to measure the CO<sub>2</sub> footprint of all relevant investments. To determine which investments are relevant, we follow the [Guidelines](#) (in Dutch) of the Commitment of the financial sector to the Dutch Climate Agreement. The starting point is that all financing and investments are relevant, except for investments whose CO<sub>2</sub> emissions are negligible.

Following the Guidelines, we consider all investments to be relevant, with the exception of investments in hedge funds. These funds invest mainly through derivative financial products (derivatives), of which the Guideline states that 'the climate impact is generally limited'. To measure the CO<sub>2</sub> footprint, we prioritize asset classes in line with the Guidelines, which distinguishes category 1 (priority) and category 2 (other) asset classes. APG reports the CO<sub>2</sub> footprint of all category 1 asset classes with the exception of Mortgages. We also report the CO<sub>2</sub> footprint of the investments in Private equity (category 2).

We consider individual investments to be relevant in the context of CO<sub>2</sub> footprint reporting if there is ownership within the capital structure and we can determine the CO<sub>2</sub> footprint. We

do not consider cash (no CO<sub>2</sub> footprint) and derivatives (no ownership within the capital structure) to be relevant investments for measuring the CO<sub>2</sub> footprint.

Due to the lack of standardized measurement methods and reliable data, we cannot yet measure the CO<sub>2</sub> footprint of all investments and asset classes. APG is closely involved in initiatives to meet these challenges. At the end of 2022, PCAF published a new methodology to calculate the CO<sub>2</sub> footprint of sovereign bonds. Now that a global standard is available, we will also report on the CO<sub>2</sub> footprint of our sovereign bond portfolio from 2024, subject to data availability.

## Methodology overview

The overview below shows which methodology we use to measure the CO<sub>2</sub> footprint of various asset classes.

### Summary of the measurement methodology

	Listed equity	Credits	Real estate	Private equity
Methodology	PCAF	PCAF	PCAF	APG methodology, based on listed equity
Distribution factor	Enterprise value including cash	Enterprise value including cash	Gross asset value	Enterprise value
Date position	31/12/2022	31/12/2022	31/12/2022	31/12/2022
Date CO <sub>2</sub> emissions	2021	2021	2021	2021
Scope	• Scope 1 & 2 • Scope 3 for selected sectors	• Scope 1 & 2 • Scope 3 for selected sectors	• Scope 1, 2 & 3	• Scope 1 & 2 • Scope 3 for selected sectors
Data provider	ISS ESG	ISS ISG	GRESB	Sector averages based on listed equities (ISS ESG)

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## Contribution factor

To allocate the CO<sub>2</sub> emissions of a company or asset to the portfolio, we use a contribution factor. This considers the total investment in relation to the total capital structure of a company or asset. Within the portfolio, investments can be made in the equity or in the debt of a company or asset. As prescribed by PCAF, we use 'enterprise value including cash'

(EVIC) for the total capital of a company or asset. If no data is available, we base our estimate on an industry average. For real estate, we use the gross asset value and for the attribution of the CO<sub>2</sub> emissions the capital invested by APG in the relevant year.

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## Calculation formula

We calculate the following numbers for the portfolio:

### Total CO<sub>2</sub> footprint in tons of CO<sub>2</sub>e (tCO<sub>2</sub>e)

$$\text{APG CO}_2 \text{ footprint (tCO}_2\text{e)} = \sum \text{Investment-specific emissions (tCO}_2\text{e)} \times \frac{(\text{Total investments (€ millions)})}{(\text{Total capital investments (€ millions)})}$$

### Relative CO<sub>2</sub> footprint in tons CO<sub>2</sub>e per million euros invested (tCO<sub>2</sub>e / € millions)

$$\text{APG relative CO}_2 \text{ footprint (tCO}_2\text{e / € millions)} = \frac{(\text{APG CO}_2 \text{ footprint (tCO}_2\text{e)})}{(\text{Market value relevant APG investments (mln €)})}$$

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## Data sources

APG uses data from external data providers to calculate the CO<sub>2</sub> footprint. The primary source of emission data is the ISS ESG database. For investments in real estate we use [GRESB](#).

The quality and coverage of data varies. That is why in some cases we need to rely heavily on assumptions, estimates and sector averages when determining the CO<sub>2</sub> footprint. In those cases, the reported CO<sub>2</sub> footprint may not accurately reflect the real world CO<sub>2</sub> footprint of the relevant investments.

APG continues to strive to increase the quality and coverage of data. Our data providers validate the emissions data reported by companies. If these are inconsistent (e.g. substantially higher or lower than those of peers or than in previous years) or incomplete (e.g. not applicable to all of the company's relevant activities), our data providers will estimate the CO<sub>2</sub> emissions. APG also validates data internally before using information to calculate the CO<sub>2</sub> footprint of the portfolio. We assess data quality (weighted on the basis of invested assets) in line with PCAF.

## How do we assess data quality

Score	Emission data	Fundamental data
1 (highest quality)	Emissions data reported by companies (e.g. via CDP, GRESB or sustainability report), verified by a third party, as provided by our data provider.	
2	Emissions data reported by companies (e.g. via CDP, GRESB or sustainability report), verified by a third party, as provided by our data provider. OR High-quality estimate of emissions data based on primary physical activity data of energy consumption (with specific emission factors in relation to primary data).	
3	Average-quality estimate of emission data based on primary physical activity data of production (with specific emission factors in relation to primary data). OR Emissions data reported by the company, extrapolation of total emissions based on shared reporting. OR Data vendor estimate.	Invested assets and EVIC are known
4	Low-quality estimate by APG based on sub-industry average	
5 (lowest quality)	Low-quality estimate by APG based on sub-industry average OR Highly generic proxies of emissions data based on broad (not sector-specific) averages.	Invested assets are known, EVIC is estimated on the basis of sector average or proxy Invested assets and EVIC are known

## Scope of emissions

The CO<sub>2</sub> footprint of individual investments is calculated on the basis of the direct and indirect greenhouse gas emissions from its own activities (scope 1 and 2), converted into equivalent tonnes of CO<sub>2</sub> (CO<sub>2</sub>e), as defined by PCAF.

In line with PCAF, we also take into account scope 3 emissions (related to the entire value chain) for investments in selected sectors. Scope 3 emissions data is less reliable than scope 1 and 2 emissions data and may also lead to double counting. Companies also

report less frequently on scope 3 emissions. For the time being, we are including scope 3 for selected sectors and are exploring possibilities for increasing the use of scope 3 emissions data going forward.

We report the scope 3 emissions of investments in a limited number of sectors with a relatively large climate impact. We show their scope 3 emissions below. For Real estate, scope 3 emissions (energy consumption by tenants) are included in the table on page 3.

### CO<sub>2</sub> footprint (scope 3) per asset class, selected sectors

	Invested assets (€ Mio)	Assets covered (%)	Absolute footprint (tCO <sub>2</sub> e)	Relative footprint (tCO <sub>2</sub> e/€ Mio)	Data quality indicator <sup>6</sup>
Listed equity	144,664	37%	39,365,005	744	2.0
- developed markets	108,686	38%	29,106,545	710	1.9
- emerging markets	35,978	33%	10,258,460	860	2.4
Credits	53,904	16%	6,731,238	786	2.5
- of which related to SDG-7	2,842	2%	1,215,272	28,107	1.0
Private equity	48,517	28%	7,981,101	616	5.0
<b>Total for which footprint is calculated</b>	<b>247,085</b>	<b>31%</b>	<b>54,077,344</b>	<b>727</b>	<b>2.6</b>
Other investments	259,657	not calculated	not calculated	not calculated	not applicable
<b>Total</b>	<b>516,742</b>				

<sup>6</sup> The data quality indicator assess data on a scale 1 (highest quality) to 5 (lowest quality). The indicator is weighted by assets invested. A detailed explanation can be found on page 7.



## CO<sub>2</sub> footprint (scope 3) per sector, selected sectors<sup>7</sup>

	Invested assets (€ Mio)	Assets covered (%)	Absolute footprint (tCO <sub>2</sub> e)	Relative footprint (tCO <sub>2</sub> e/€ Mio)	Data quality indicator
Communication services	17,150	0%	-	-	-
Consumer discretionary	24,752	35%	8,710,314,533	929	2.7
Consumer staples	15,645	62%	9,775,432,701	290	2.4
Energy	3,052	100%	3,050,725,518	1,563	3.6
Financials	56,598	0%	-	-	-
Health care	31,180	44%	520,681	38	2.5
Industrials	25,449	70%	26,007,574	1,466	2.9
Information Technology	45,416	22%	1,939,266	190	1.9
Materials	11,239	100%	9,910,629	885	2.7
Real estate	4,753	0%	-	-	-
Utilities	8,896	0%	-	-	-
<b>Total</b>	<b>244,130</b>	<b>31%</b>	<b>54,077,344</b>	<b>727</b>	<b>2.6</b>

<sup>7</sup> This includes the assets classes Listed equity, Credits, Real estate and Private Equity and does not include investments that cannot be associated with a specific sector.

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## Considerations by asset class

### Listed equity

The availability of data on Listed equity is generally good, especially for companies in CO<sub>2</sub>-intensive sectors in developed markets. Nevertheless, data provider estimates play an important role, especially for smaller companies and companies in emerging markets.

### Credits

In general, fewer data are available for Credits than for Listed Equity. There is considerable overlap between these asset classes, but the Credit universe also includes smaller companies and companies that are not listed.

A significant proportion of our investments in corporate bonds are green bonds. The proceeds of these bonds are ringfenced for specific sustainable purposes. By investing in green bonds, we can contribute directly to greening projects, including those of companies that are relatively CO<sub>2</sub>-intensive. An example is an electricity company that partially depends on fossil fuels to produce electricity but issues a green bond to invest in renewable energy. This relates primarily to green bonds that contribute to SDG 7: Affordable and clean energy.

The PCAF standard does not specify how to measure the CO<sub>2</sub> footprint green bond investments. We include our green bond investments in the calculation of the CO<sub>2</sub> footprint based on the emissions of the entire company. These emissions are potentially much higher than the CO<sub>2</sub> footprint of the specific projects financed with the proceeds of the bond. As a result, the CO<sub>2</sub> footprint of our Credits portfolio is likely to be overestimated. That is why we also separately report the CO<sub>2</sub> emissions of green bonds that primarily contribute to SDG 7.

In addition to corporate bonds, the Credits portfolio also includes securitized investments (e.g. mortgage-backed securities). The CO<sub>2</sub> emissions of these investments are estimated on the basis of data on the issuer (e.g. a bank). This allows us to include a larger part of the portfolio in the CO<sub>2</sub> footprint calculation.

To measure the CO<sub>2</sub> footprint of our Credit portfolio, we use CO<sub>2</sub> emission data and fundamental data (e.g. enterprise value and revenue). If this information is not available for a specific company, we use data on the parent company. The parent company may not be fully representative of the emission profile of the company in which we invest. If no fundamental data is available, we use an estimate based on a sector average.

### Real Estate

The asset class Real estate consists of both listed equity investments and investments in private real estate. The global PCAF standard focuses on real estate loans, while our investments are in real estate equity. We therefore measure the CO<sub>2</sub> footprint of our real estate investments in line with the global PCAF methodology for listed equity and credits.

Our primary data source for CO<sub>2</sub> emissions in real estate is GRESB. For investments that do not or only partially report to GRESB, we estimate emissions as follows:

- If a real estate investment reports emissions for only some of the properties in its portfolio, we calculate the total emissions by extrapolating to 100% of the portfolio.
- If a real estate investment does not report to GRESB, we estimate the emissions based on the average emissions of other real estate investments in our portfolio in the relevant sector that do report to GRESB.
- If we do not know to which sector a real estate investment belongs and it does not report to GRESB, we estimate emissions based on a generic average of all our real estate investments that do report to GRESB.

The calculation relates to the direct and indirect emissions from business operations (scope 1 and 2) and the energy consumption of tenants (downstream scope 3). GRESB provides information on the total CO<sub>2</sub> emissions of an investment (scope 1, 2 and 3). For this reason, it is not possible to report separately on the scope 3 emissions of our real estate portfolio

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## Private equity

For Private equity, APG invests through external managers in a large number of unlisted companies. In this asset class, fundamental data and information on CO<sub>2</sub> emissions are very limited. APG estimates the CO<sub>2</sub> footprint of the private equity portfolio using sector averages derived from the listed equity universe.

To measure the CO<sub>2</sub> footprint of the private equity portfolio, we use the holdings in sectors in the portfolio, combined with sector averages of the listed equity portfolio, and an estimate of the allocation factor. An adjustment is made to account for the difference in leverage between the capital structure of listed companies and private equity companies. This is related to the fact that private equity is generally financed with more debt than listed companies. Therefore, we multiply the debt of listed companies by a leverage factor of 1.2.

The calculation of the CO<sub>2</sub> footprint of the private equity portfolio is thus based on rough assumptions in terms of CO<sub>2</sub> emissions and fundamental data (e.g. revenue and enterprise value). The CO<sub>2</sub> footprint figure for the private equity portfolio is therefore of lower quality than that of other asset classes.

## Reducing our CO<sub>2</sub> footprint

All our pension fund clients have a target for reducing the CO<sub>2</sub> footprint of their listed equity portfolio. Since the baseline year 2015, the CO<sub>2</sub> footprint of the equity portfolio that APG manages on behalf of its pension fund clients has decreased by 56%.

In line with Climate Commitment of the Dutch Financial Sector to the Dutch Climate Agreement, our pension fund clients in 2022 announced new and updated climate targets for 2030. This includes a 50% absolute reduction target for the CO<sub>2</sub> footprint of the listed equity and credit portfolios.

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## Glossary

### **Absolute CO<sub>2</sub> footprint**

The part of a portfolio company's CO<sub>2</sub> footprint or real asset that can be allocated to APG on the basis of the invested capital.

### **CO<sub>2</sub>e**

Unit for measuring the greenhouse effect of greenhouse gases carbon dioxide, nitrous oxide, methane and fluorinated gases. One kilogram of CO<sub>2</sub>e is equivalent to the greenhouse effect of 1 kilogram of CO<sub>2</sub>.

### **GRESB**

Global Real Estate Sustainability Benchmark. GRESB publishes data and an annual benchmark on the ESG performance of real estate funds.

### **ISS ESG**

Institutional Shareholder Services (ISS) database for assessing companies' ESG performance.

### **Green bonds**

Bonds designed to support specific climate-related or environmental projects.

### **PCAF**

Partnership for CO<sub>2</sub> Accounting Financials. Cooperation of Dutch and international investors, including APG, who have developed a measurement method for determining the CO<sub>2</sub> impact of investments and loans.

### **Relative CO<sub>2</sub> footprint**

The CO<sub>2</sub> footprint per million euros of invested capital (tons of CO<sub>2</sub> equivalent/million euros); This makes comparison with other investors possible.

### **Scope 1**

Covers all direct emissions from the activities of an organization or from resources under their control (such as buildings, machines and transportation).

### **Scope 2**

Covers all direct emissions from the activities of an organization or from resources under their control (such as buildings, machines and transportation).

### **Scope 3**

Covers all other indirect emissions from activities of the organization which occur from sources that they do not own or control – the emissions from the whole production chain, including clients.

### **SDG's**

Sustainable Development Goals. A collection of 17 interlinked goals designed to be a blueprint to achieve a better and more sustainable future for all.

### **Total CO<sub>2</sub> footprint**

Total CO<sub>2</sub> emissions than can be allocated to the investment portfolio.