

ABP's carbon footprint: Trend analysis per asset class and sector



Ward Warmerdam, Joeri de Wilde, Jan Willem van Gelder and Alexandra Christopoulou

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About this report

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Authorship

This report was researched and written by Ward Warmerdam, Joeri de Wilde, Jan Willem van Gelder and Alexandra Christopoulou, with contributions from Michel Riemersma and Mara Werkman. Correct citation of this document: Warmerdam, W., J. de Wilde, J. W. van Gelder and A. Christopoulou (2019, July), *ABP's carbon footprint: Trend analysis per asset class and sector*, Amsterdam, The Netherlands: Profundo.

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Table of contents

Summary	1
Abbreviations.....	6
Introduction	7
Chapter 1 Methodology and limitations	8
1.1 Methodology per asset class.....	9
1.1.1 Listed equities.....	9
1.1.2 Corporate bonds	10
1.1.3 Sovereign bonds	10
1.1.4 Real estate	12
1.2 Emissions data	13
1.2.1 Emissions scope categorization.....	13
1.2.2 Company level data.....	13
1.2.3 National level data.....	15
1.3 Discussion on methodological problems	15
1.3.1 Identification of equities, bonds and real estate portfolio.....	15
1.3.2 Determination of enterprise value.....	16
1.3.3 Assessing the government share in the output of different sectors	17
1.3.4 Emissions estimation methodology.....	17
1.3.5 GHG emissions per economic industry.....	18
1.3.6 Scope 3 emissions	18
Chapter 2 Findings	20
2.1 Overview	20
2.2 Equity investments.....	22
2.3 Corporate bond investments	26
2.4 Sovereign bond investments	29
2.5 Real estate investments.....	33
Reference.....	34

List of figures

Figure 1 ABP attributable CO2 emissions from all asset classes (2015 & 2018, million tCO2e)	1
Figure 2 All assessed asset classes: Analysis of change in emissions.....	2
Figure 3 ABP attributable CO2 emissions from all asset classes (2015 & 2018, million tCO2e)	20
Figure 4 Proportion of ABP attributable emissions per asset class (2015-2018)	21
Figure 5 All assessed asset classes: Analysis of change in emissions.....	22
Figure 6 ABP equity investment CO2 emissions (2015 & 2018, million tCO2e).....	23

Figure 7	Changes in ABP attributable total emissions from its equity portfolio	23
Figure 8	Equity investments: Analysis of change in emissions per sector	24
Figure 9	2018 ABP attributable emissions per industry group in equity portfolio ..	25
Figure 10	ABP corporate bond investment CO2 emissions (2015 & 2018, million tCO2e)	26
Figure 11	Changes in ABP attributable total emissions from its corporate bond portfolio	27
Figure 12	Corporate bond investments: Analysis of change in emissions per sector.	28
Figure 13	2018 ABP attributable emissions per industry group in corporate bond portfolio	29
Figure 14	ABP sovereign bond investment CO2 emissions (2015 & 2018, million tCO2e)	29
Figure 15	Changes in ABP attributable total emissions from its sovereign bond portfolio	30
Figure 16	Sovereign bond investments: Analysis of change in emissions per country	31
Figure 17	2018 ABP attributable emissions per country in sovereign bond portfolio	32
Figure 18	ABP real estate CO2 emissions (2015 & 2018, million tCO2e)	33

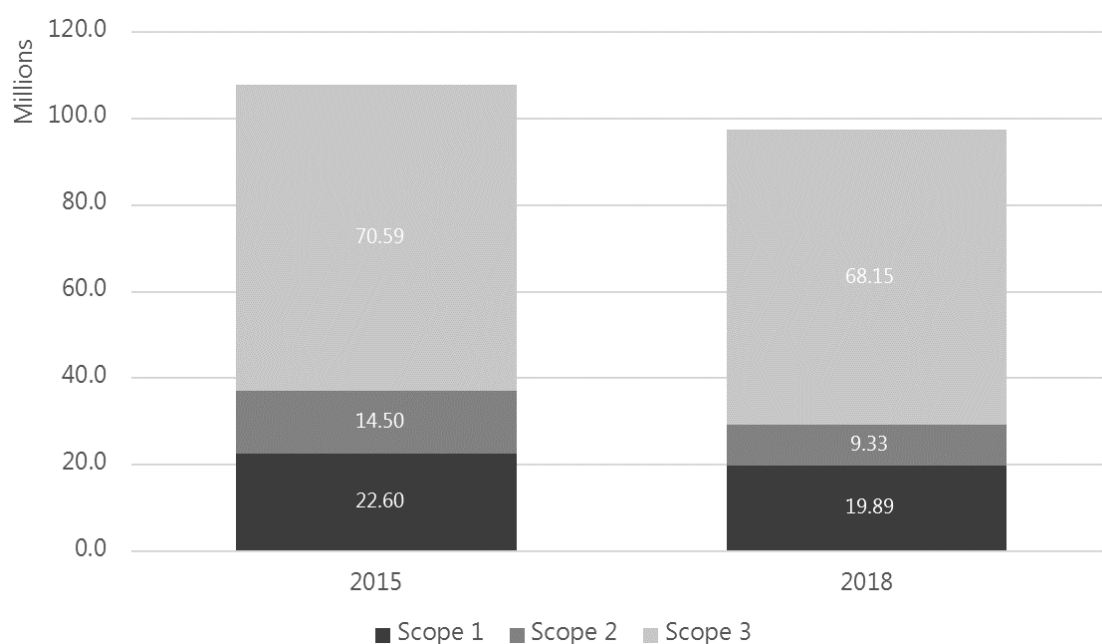
Summary

Since 2015, Dutch pension fund ABP provides an insight in the carbon footprint of its listed equity investments. However, ABP does not report on the footprint of several of its other investments, although these asset classes are also covered by the Platform Carbon Accounting Financials (PCAF) methodology. PCAF is an initiative of Dutch financial institutions to measure the carbon footprints of their investments. The members include 14 Dutch banks, asset managers, insurance companies, and pensions funds. ABP is part of the PCAF sounding board to ensure alignment with financial institutions not participating in PCAF. As the PCAF methodology was developed and is promoted by financial institutions also in dialogue with ABP, and the fact that the methodology is publicly accessible makes it a useful methodology to calculate the carbon footprint of ABP.

This research, therefore, set out to both calculate ABP's attributable emissions from three additional significant asset classes – corporate bonds, sovereign bonds, and real estate – and to calculate the attributable emissions from its equity investments in further detail using the PCAF methodology. ABP only includes scope 1 and scope 2 emissions, and does not provide a detailed sector level disclosure of its emissions. This research therefore additionally researched scope 3 emissions and identified emissions per sector.

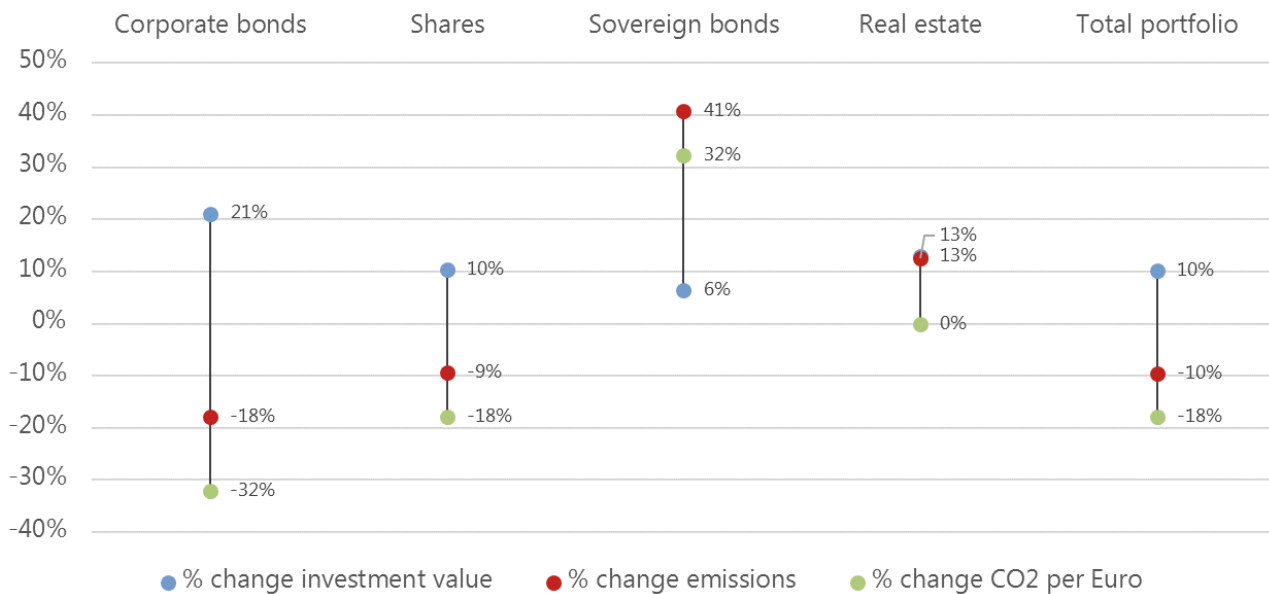
The analysis of ABP's attributable CO₂ emissions from the portfolio of its investments has found that the total emissions from all four asset classes – equity investments, corporate bonds, sovereign bonds, and real estate – has decreased by 9.5% from 108 million tCO₂e in 2015 to 97 million tCO₂e in 2018. The decrease in emissions is mainly driven by reductions in attributable emissions from the corporate bond and equity investment portfolios. There were increases in attributable emissions from the sovereign bond and real estate portfolios. When scope 3 emissions are excluded, there is a reduction of 21% of scope 1 and scope 2 emissions from 37 million tCO₂e to 29 million tCO₂e.

Figure 1 ABP attributable CO₂ emissions from all asset classes (2015 & 2018, million tCO₂e)



ABP's invested value considered in this research increased 10% between 2015 and 2018. As mentioned above, the total portfolio emissions decreased by 9.6%, as a result there is a reduction of relative emissions (CO2 per Euro invested) of 18%. This trend is also observed for ABP's most important asset classes – equity investments and corporate bonds (see Figure 2). There was an 21% increase in investments in corporate bonds, and an 18% reduction in emissions attributable to ABP's bond portfolio. As result CO2 per Euro decreased by 32%. ABP's share portfolio – normalized for 2015 positions – increased by 10%, however, emissions decreased by 9%. This resulted in 18% reduction in relative CO2 emissions per Euro.

Figure 2 All assessed asset classes: Analysis of change in emissions



Emissions from ABP's sovereign bond portfolio increased by 41%. However, the value of its sovereign bond portfolio – identified in its top 100 holdings disclosure – only increased by 6%. As result, the relative emissions from its sovereign bond portfolio increased by 32%. The value of assessed investments in real estate increased by 13%, emissions attributable to these investments also increased by 13%. Therefore, the relative emissions per invested Euro in this asset class remained the same.

- **Equity investment emissions**

Emissions of ABP's equity investment portfolio decreased by approximately 9% from 84 million tCO2e in 2015 to 76 million tCO2e in 2018. Scope 1 emissions declined by 27% from 16.3 million tCO2e in 2015 to 11.8 million tCO2e in 2018. Scope 2 emissions decreased by 40% from 9.8 million tCO2e to 5.9 million tCO2e. Scope 3 emissions remained relatively stable. This study found that the overall decrease of scope 1 and 2 emissions, was approximately 32%. This is a larger decrease than that reported by ABP.

Companies active in the oil & gas sector, electric utility sector, multiline utility sector, coal mining sector and natural gas utility sector account for approximately 51% of ABP's total equity portfolio emissions in 2018. This is relatively stable compared to 2015 when these companies accounted for approximately 49 % of ABP's equity investment related emissions.

Companies in the oil & gas sector – including companies such as BP, Shell and Exxon Mobil – contributed the most to the equity portfolio emissions of ABP, at approximately 29 million tCO₂e in 2018, accounting for 38% of ABP's total equity portfolio emissions. From 2015 to 2018 there was a 21% increase in the total emissions generated by oil & gas companies in ABP's equity portfolio. Similarly, emissions from companies engaged in natural gas utilities increased by 75% between 2015 and 2018 to approximately 1.2 million tCO₂e.

Emissions attributable to ABP's investments in automobile manufacturers – such as Daimler and Peugeot – doubled in the period 2015 to 2018, to around 11.2 million tCO₂e. The highest emissions from this sector are Scope 3 emissions – accounting for approximately 98% of the total emissions from the sector – although it should be noted that approximately 80% of the total emissions of the oil & gas sector are scope 3 emissions. Scope 3 emissions are excluded from ABP's own assessments.

A deeper analysis of the correlations between invested values and emissions per sector found that relative emissions from ABP's investments in oil & gas increased by 15%, as the total value of these investments increased by 6% and attributable emissions increased by 21%, indicating that investments were made in companies with more emissions. On the other hand, there was a 45% decrease in relative emissions from ABP's investments in companies active in coal mining – such as Glencore and China Shenhua Energy – while there was only a 5% decrease in the value of investments, and a 48% decrease in the attributable emissions. This indicates that divestments were made from the worst polluters in the sector. A similar trend is observed in investments in companies active in electric utilities – such as Enel, CLP and Duke Energy – where relative emissions decreased by 28%, as the value of these investments decreased by 26% but the attributable emissions decreased by 46%. Again indicating that companies with higher emissions were removed from ABP's portfolio, or these utility companies reduced their emissions through a restructuring of their generation portfolio.

Relative emissions attributable to passenger transportation services – primarily airlines, but also railway operators – increased by 26%, while the value of investments increased by 61% and the total attributable emissions increased by 103%. Indicating investment in companies with higher emissions. ABP's relative emissions from companies active in the production of automobiles and auto parts increased by 107%, while the value of investments decreased by 4%. Again indicating an increase in investments of higher emitters.

- **Corporate bonds**

Attributable emissions of ABP's corporate bond investment portfolio decreased 18% from approximately 18.7 million tCO₂e in 2015 to 15.4 million tCO₂e in 2018. Companies active in the oil & gas sector, electric utility sector, multiline utility sector, coal mining sector and natural gas utility sector accounted for approximately 59% of ABP's total emissions in 2018. In 2015 companies active in these sectors only accounted for approximately 37% of ABP's corporate bond related emissions.

As with ABP's equity portfolio, companies in the oil & gas sector – such as Total, Pemex and BP – contributed the most to the corporate bond portfolio emissions, at approximately 3.2 million tCO₂e in 2018, accounting for 22% of ABP's total corporate bond portfolio emissions. From 2015 to 2018 there was a 29% increase in the total emissions generated by oil & gas companies and oil & gas related equipment and service companies from 2.6 million tCO₂e in 2015 to 3.4 million tCO₂e in 2018. ABP's emissions from its corporate bonds of electric utility and multiline utility companies – such as The Southern Company, Stedin and RWE – increased by 47% and 31% respectively, taken together they increased 65% from 2.1 million tCO₂e in 2015 to 4.8 million tCO₂e in 2018. Emissions from companies active in the passenger transportation services – primarily airlines – increased by 46% from 0.13 million tCO₂e to 0.19 million tCO₂e.

Contrary to ABP's equity investments in the oil & gas sector, the relative emissions of ABP's corporate bond investments in the oil & gas increased by 20% as a result of a 37% increase in the value of these investments and a 26% increase in the total attributable emissions. This indicates that ABP may have invested more selectively in the bonds of companies with lower emissions as the increase in the total emissions is less than the increase in the total investments.

The opposite is true for ABP's investments in the corporate bonds of companies engaged in electric utilities. ABP increased the value of these investments by 22%, while ABP's absolute emissions attributable to the sector increased by 47%, resulting in a 97% increase in relative emissions. This indicates that ABP invested more in companies with higher emissions. A similar, but more pronounced trend is observed in other sectors. For example, ABP's investments in the bonds of companies active in aerospace & defence – such as United Technologies, L3 Technologies and Bombardier – increased by 306%, total attributable emissions from the sector increased by approximately 740%, resulting in an increase in relative emissions of 3,528%. Similarly, the value of investments in construction materials – such as HeidelbergCement – increased by 27%, while absolute attributable emissions increased by 34%. Relative emissions from ABP's investments in the corporate bonds of companies active in this sector increased 105% indicating an increase in relatively large emitters.

- **Sovereign bonds investments**

Attributable emissions from ABP's sovereign bond portfolio increased by 41% from 0.9 million tCO₂e in 2015 to 1.3 million tCO₂e in 2018. In 2018, emissions from the United States accounted for 62% of ABP's attributable emissions from its sovereign bond portfolio. This is an increase from 2015 when the United States accounted for 49% of ABP's attributable emissions from its sovereign bond portfolio. ABP attributable emissions from the United States increased by more than 78% from 0.45 million tCO₂e in 2015, to 0.80 million tCO₂e in 2018. Emissions from ABP's investments in bonds from the United Kingdom increased by almost 200%, from 0.03 million tCO₂e in 2015 to 0.8 million tCO₂e in 2018.

ABP attributable emissions from a number of countries decreased. Emissions from French sovereign bonds decreased 32% from 0.16 million tCO₂e in 2015 to 0.11 million tCO₂e in 2018. Emissions from Dutch sovereign bonds decreased by 24% from 0.04 million tCO₂e in 2015 to 0.03 million tCO₂e.

A deeper analysis of the correlations between invested values and emissions per country gives further insights. As noted above, emissions from Dutch sovereign bonds decreased by 24%, however, investments decreased by 28%. The relative emissions therefore increased by 5%. This is due to an increase in the attribution factor as emissions decreased at a slower pace (3%) than the reduction in government debt (6%). The relative emissions from ABP's investments in the sovereign bonds of the United Kingdom increased by 16% as ABP increased the value of its investments by 157% and total attributable emissions increased by 199%. This is due to an increase in emissions in the UK, and an increase in the attribution factor due to lower UK government debt.

Similarly, relative emissions from ABP's investments in sovereign bonds from the United States increased by 3%, as a result of a 73% increase in the value of its investments, and a 78% increase in total attributable emissions. While total US emissions decreased slightly, the attribution factor increased.

Relative emissions from the investments in sovereign bonds of a number of countries decreased, namely: Austria, Belgium, Italy and Spain (the relative emissions from Irish sovereign bonds decreased by 100% because sovereign bonds from this country did not appear in the 2018 Top 100 investments). Among these countries, ABP only increased its investments in the sovereign bonds of Belgium. This indicates a reduction in the total emissions of Belgium, and/or a reduction its attribution factor. For the other countries ABP decreased the value of its investments.

- **Real estate investments**

Attributable emissions from ABP's real estate portfolio increased 13% from 4.1 million tCO₂e in 2015 to 4.6 million tCO₂e in 2018.

ABP's assessed investments in real estate increased by 13%, which the same pace as the increase in absolute attributable emissions. As a result, there is no change in the relative emissions from ABP's investments in real estate.

Abbreviations

ABP	Stichting Pensioenfonds Algemeen Burgerlijk Pensioenfonds
CDP	Carbon Disclosure Project
CO2	Carbon Dioxide
EPA	Environmental Protection Agency
EU	European Union
Eurostat	European Statistical Office
GHG	Greenhouse Gas
IMF	International Monetary Fund
ISIN	International Securities Identification Numbers
OECD	Organization for Economic Cooperation and Development
PCAF	Platform Carbon Accounting Financials
tCO2e	Tonnes of carbon dioxide equivalents
UK	United States
US	United Kingdom

Introduction

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This research, therefore, set out to both calculate ABP's attributable emissions from three additional significant asset classes – corporate bonds, sovereign bonds, and real estate – and to calculate the attributable emissions from its equity investments in further detail using the PCAF methodology. ABP only includes scope 1 and scope 2 emissions, and does not provide a detailed sector level disclosure of its emissions. This research therefore additionally researched scope 3 emissions and identified emissions per sector.

This report is organized as follows: Chapter 1 details the research methodology and discusses caveats, and; Chapter 2 presents the findings of the calculation of ABP's attributable emissions per asset class and per sector.

A summary of the findings of this report can be found on the first pages of this report.

Chapter 1 Methodology and limitations

This chapter outlines the research methodology used to calculate ABP's carbon footprint. Additionally, it provides notes on specific issues relevant for the study of ABP's portfolio, and a discussion of caveats and issues arising from the applied methodology.

Since 2015, Dutch pension fund ABP provides an insight in the carbon footprint of its listed equity investments. However, ABP does not report on the footprint of several of its other investments, although these asset classes are also covered by the Platform Carbon Accounting Financials (PCAF) methodology. PCAF is an initiative of Dutch financial institutions to measure the carbon footprints of their investments. The members include 14 Dutch banks, asset managers, insurance companies, and pensions funds. ABP is part of the PCAF sounding board to ensure alignment with financial institutions not participating in PCAF. As the PCAF methodology was developed and is promoted by financial institutions also in dialogue with ABP, and the fact that the methodology is publicly accessible makes it a useful methodology to calculate the carbon footprint of ABP.

This research, therefore, set out to both calculate ABP's attributable emissions from three additional significant asset classes – corporate bonds, sovereign bonds, and real estate – and to calculate the attributable emissions from its equity investments in further detail using the PCAF methodology. ABP only includes scope 1 and scope 2 emissions, and does not provide a detailed sector level disclosure of its emissions. This research therefore additionally researched scope 3 emissions and identified emissions per sector.

The asset classes addressed by PCAF in its methodology document are:

1. Sovereign bonds
2. Listed equity
3. Project finance
4. Mortgages
5. Commercial real estate
6. Corporate debt
7. Corporate/SME loans
8. Indirect investments¹

Since ABP is mainly involved in the asset classes sovereign bonds, listed equity, commercial real estate and corporate bonds, and discloses its positions in these asset classes in sufficient detail this research project focused on these four asset classes. ABP also invests in hedge funds (5%), private equity (5%), commodities (4%) and infrastructure (3%).² However, as details of these investments are not disclosed, these could not be considered for this research. Moreover, ABP does not disclose positions where such disclosure would negatively impact the value of particular positions, or it is not permitted to disclose these positions for legal reasons. Additionally, ABP does not disclose the full details of its sovereign bond or real estate portfolios. Part of these positions are identified in its disclosure of its Top 100 investments. As such, a full carbon footprinting analysis could not be carried out. Therefore, the emissions values reported here are lower than the actual emissions of ABP through its investment portfolio.

1.1 Methodology per asset class

This research used the PCAF methodology to calculate the CO2 emissions of ABP's investment portfolio. The sections below provide a brief description of the methodology per asset class, as well as specific considerations for this research.

1.1.1 Listed equities

ABP discloses the majority of its equity portfolio including both names of companies and the value of its positions (approximately 97.6% in value of ABP's investments in shares in 2018 are disclosed and covered by this research).³ This research entered ABP's listed equity portfolio into a Bloomberg monitor in order to obtain company identifiers. The monitor generated both equity identifiers and bond identifiers. All bond identifiers were converted to equity identifiers. This research relied primarily on ISINs, but also used Bloomberg tickers for data retrieved from Bloomberg. These identifiers were used to retrieve emissions data (see section 1.2.2), as well as financial and company information such as share prices, total revenue, number of employees, and industry classification.

In order to calculate the attributable emissions of a listed equity position, three data points are needed: invested value; company emissions; and; enterprise value. The invested value is provided by ABP in its disclosures. The company emissions data is derived from the sources described in section 1.2.2. The enterprise value can generally be obtained from financial data service providers (see section 1.3.2 for a discussion on enterprise value). According to the PCAF methodology attributable emissions for listed equity positions are calculated as follows:⁴

$$\sum \left(\frac{\text{Invested value}}{\text{Enterprise value}} \right) \times \text{Emissions}$$

First, the *attribution factor* is calculated. This is the invested value divided by the enterprise value. This attribution factor is then multiplied by company emissions to derive ABP's attributable emissions. This process is followed for each equity position in ABP's portfolio.

In line with ABP's own practice, 2018 positions ABP also held in 2015 were normalized - for 2015 share prices and enterprise values to account for share price fluctuations, in order to calculate adjusted attribution factors.ⁱ For this research ABP's equity portfolios as of December 2015 and December 2018 were compared.

ⁱ Normalization is needed in order to make a more accurate comparison between two years, i.e. the 2015 baseline and the most recent year 2018. Normalization here limits the potential causes of changes in attributable emissions from four (share price fluctuations, number of shares, enterprise value and company emissions) to two (number of shares and company emissions). Normalizing the invested value – the numerator in the attribution factor formula – from 2018 to 2015 figures implies calculating the number of shares in 2018 and applying the 2015 share price as invested value is the number of shares held multiplied share price. If after normalization of the invested value there is a difference between 2015 and 2018 this is due changes in the number of shares. As these are then divided by the enterprise value the attribution factor will then be higher or lower depending on changes in the investments in the relevant companies.

1.1.2 Corporate bonds

ABP discloses a proportion of its bond portfolio including both names of companies and the value of its positions. Approximately 65% of the invested value in 2018 is disclosed.⁵ This research entered ABP's corporate bond portfolio into a Bloomberg monitor in order to obtain company identifiers. The Bloomberg monitor generated both equity identifiers and bond identifiers. Both bond and equity identifiers were converted to ISINs. Where bond identifiers were missing, this research identified bonds issued in or before 2018 with a maturity date after 2019 for which an ISIN was available. This research relied primarily on ISINs, but also used Bloomberg tickers for data retrieved from Bloomberg. These identifiers were used to retrieve emissions data (see section 1.2.2), as well as financial and company information such as share prices, total revenue, number of employees, and industry classification.

The methodology to calculate attributable emissions for corporate bonds is similar to the methodology to calculate the attributable emissions of a listed equity position. In order to calculate the attributable emissions of a corporate bond position, three data points are needed: invested value; company emissions; and; enterprise value. The invested value is provided by ABP in its disclosures. The company emissions data is derived from the sources described in section 1.2.2. The enterprise value can generally be obtained from financial data service providers (see section 1.3.2 for a discussion on enterprise value). According to the PCAF methodology attributable emissions for corporate bond positions are calculated as follows:⁶

$$\sum \left(\frac{\text{Invested value}}{\text{Enterprise value}} \right) \times \text{Emissions}$$

First, the *attribution factor* is calculated. This is the invested value divided by the enterprise value. This attribution factor is then multiplied by company emissions to derive ABP's attributable emissions. This process is followed for each corporate bond position in ABP's portfolio.

However, for corporate bonds it is not possible – at least for this research – to calculate a normalized value for bonds held in both 2018 and 2015. This is because ABP reports on its corporate bond portfolio at the company level, but data points needed to normalize bond positions – e.g. maturity date and interest rate – are bond specific. For this research ABP's equity portfolios as of December 2015 and December 2018 were compared.

1.1.3 Sovereign bonds

ABP does not disclose its entire sovereign bond portfolio. However, it does disclose its top 100 overall investments in equity, real estate and fixed income (corporate and sovereign bonds), of which sovereign bonds are among the most important investments. Therefore, the CO2 emissions of ABP's sovereign bond portfolio for the years 2015 and 2018 were calculated using the PCAF methodology. The sovereign bonds in the top 100 overall investments account for approximately 89% in value of ABP's sovereign bond investments.

In order to calculate the attributable emissions of a sovereign bond position the following data points are needed: invested value; government debt; input-output data to identify government spending per industry, and; national emissions tables per industry. These are then used to calculate the investor's relative CO2 emissions as follows:

$$\sum \left(\frac{\text{Invested value}}{\text{Government debt}} \right) \times \text{Emissions}$$

First, the *attribution factor* is calculated. This is the invested value divided by the national government debt. Direct emissions – scope 1 – are the total emissions of the government sector. Indirect – scope 2 – emissions are the government's share in the emissions of the electricity, gas and water supply sector. Scope 3 emissions are the sum of the government's share in all other sectors. These were calculated as follows:

- Input-Output tables were collected for each country, which give data on the total output of each sector and the share of government expenditure of this sector output. For EU member states this was retrieved from Eurostat, for the United States it was obtained from the Bureau of Economic Analysis of the United States.
- Data on GHG emissions per sector were collected for each country. For EU member states this data was collected from Eurostat, for the United States it was retrieved from the EPA. EPA emissions data for the United States did not specify direct scope 1 emissions. These are therefore included in the scope 3 emission figure.
For Scope 1, the total emissions of the government sector were used. In the NACE sector break-down used by Eurostat, this is economic activity 'O - Public administration and defence; compulsory social security'. In the US data the emissions of the government sector are not specified. This means that no separate figure for Scope 1 emissions could be calculated, Scope 1 emissions are included in the figure for Scope 3 emissions.
- For Scope 2, the emissions of the electricity, gas and water supply sector were used. In the NACE sector break-down this is the economic activity 'D - Electricity, gas, steam and air conditioning supply'. The total emissions of this sector were multiplied with the share of government expenditure of the total output of this sector.
- For Scope 3, the GHG emissions for each economic sector were multiplied with the share of government expenditure of the total output of each sector. Adding up all these GHG emission figures provides the total GHG emissions figure attributable to the government of the country. Subtracting the Scope 1 and Scope 2 estimates made earlier, yields the Scope 3 estimate.
- Scope 1, Scope 2 and Scope 3 estimates are then divided by the outstanding government debt for the particular year, to come to *attribution factors* expressed in tons of GHG emissions per million euros.
- The value (in million euros) of the holdings of ABP of the different sovereign bonds are then multiplied with the *attribution factors*, to estimate the Scope 1, Scope 2 and Scope 3 GHG emissions attributable to ABP.
- The values held by ABP in sovereign bonds in 2018 were brought to levels of 2015 to allow comparison. This was achieved by using the long-term interest rates (10 years) of sovereign bonds. Thus, this assumes that the average portfolio of ABP consists of 10-year sovereign bonds. For example, if ABP held in 2015, USD 100 million of sovereign bonds of country A and in 2018 this amount increased to USD 200 million. Also, country A's 10-year bond interest rate was 0.75 in 2015 and 0.80 in 2018. Then, the value of 2018 in levels of 2015 is calculated at USD 202 million, taking into account an increase of the interest rate of 0.5%.
- Government debt data are available for all countries in the world from the IMF, up to 2017. We have converted these data in euros, the currency used by ABP in their reporting. And for the 2018 data, we assumed a growth of the government debt which was equal to GDP growth of the country.

- To deal with missing data and a lack of standardisation, in this study detailed emissions estimates were made for the European countries of which ABP holds sovereign bonds, plus the United States. Together, these countries account for 97% of ABP's sovereign bond portfolio in 2015 and 93% in 2018, in so far these portfolios are included in the top-100 lists of ABP investments. Based on the detailed estimates for the European countries and the US, average attribution factors for Scope 1, Scope 2 and Scope 3 emissions were determined. These average attribution factors were then applied on ABP holdings of sovereign bonds issued by other countries, which account for 3% of ABP's sovereign bond portfolio in 2015 and 7% in 2018.

1.1.4 Real estate

ABP does not disclose its entire real estate portfolio. However, it does disclose its top-100 overall investments in all asset classes, some of these are investments in real estate companies. Therefore, part of ABP's real estate portfolios in 2015 and 2018 could be analysed for their emissions. The real estate investments in the top 100 overall investments account for approximately 65% in value of ABP's real estate investments.⁷

In the disclosure of its real estate investments ABP only lists the funds and/or real estate companies through which it invests in real estate. It does not disclose its investments in specific properties. Therefore, the PCAF methodology for calculating commercial real estate investments could not be applied. As ABP's disclosure was at the company or fund level, this current research applied the same methodology for calculating emissions as for listed equities (see section 1.1.1) and corporate bonds (see section 1.1.2).

In order to calculate the attributable emissions, three data points are needed: invested value; company emissions; and; enterprise value. The invested value is provided by ABP in its disclosures. The company emissions data is derived from the sources described in section 1.2.2. Additionally, for real estate investments, this research also obtained additional emissions data from the real estate company publications where these were available. The enterprise value can generally be obtained from financial data service providers (see section 1.3.2 for a discussion on enterprise value). In cases where the enterprise value was not available for real estate companies it was calculated on the basis of its component elements, however, shareholder equity was substituted for market capitalization. Accordingly, the attributable emissions for real estate positions were calculated as follows:⁸

$$\sum \left(\frac{\text{Invested value}}{\text{Enterprise value}} \right) \times \text{Emissions}$$

First, the *attribution factor* is calculated. This is the invested value divided by the enterprise value. This attribution factor is then multiplied by company emissions to derive ABP's attributable emissions. This process is followed for each corporate bond position in ABP's portfolio.

For a number of companies, data that could be used for the denominator could not be identified. In terms of value 28% of ABP's 2015 real estate portfolio, and 29% of its 2018 real estate portfolio could not be estimated.

1.2 Emissions data

1.2.1 Emissions scope categorization

GHG emissions are divided into the direct and indirect emissions of companies or institutions as follows:

- **Scope 1 – Direct emissions**

These are the GHG emissions that are generated directly by sources owned or controlled by the company or institution.⁹

- **Scope 2 – Indirect emissions from electricity**

These are the GHG emissions generated from the electricity, steam, heating and cooling purchased and consumed by the company or institution.¹⁰

- **Scope 3 – Other indirect emissions**

These are all indirect emissions that are not included in Scope 2 which occur in the value chain of the company or institution, including both upstream and downstream emissions. Scope 3 emissions include the following 15 categories:

1. Purchased goods and services
2. Capital goods
3. Fuel- and energy-related activities (not included in scope 1 or scope 2)
4. Upstream transportation and distribution
5. Waste generated in operations
6. Business travel
7. Employee commuting
8. Upstream leased assets
9. Downstream transportation and distribution
10. Processing of sold products
11. Use of sold products
12. End-of-life treatment of sold products
13. Downstream leased assets
14. Franchises
15. Investments¹¹

Companies determine themselves which scope 3 emissions to include in their inventory, i.e. how they define their operational boundaries. Once companies have defined their operational boundaries, accounting standards such as the Greenhouse Gas Protocol have defined accounting practices for companies to follow to create completeness and consistency in reporting (see section 1.3.6 for a brief discussion on scope 3 accounting and reporting).

1.2.2 Company level data

ABP uses Trucost as their data provider for company level CO₂ emissions. However, the PCAF methodology allows other data sources to be used, including Carbon Disclosure Project (CDP) and Bloomberg, among others.¹² This research used company level data from three sources: CDP, Thomson Reuters EIKON and Bloomberg (please see section 1.3.4 for a discussion on the limitations of company level emissions data).

Companies provide data to CDP voluntarily through the use of CDP's reporting template. CDP then hosts this data on its website. This data can then be purchased. CDP also has data partnerships with Bloomberg and MSCI among others.

Both Bloomberg and Thomson Reuters EIKON gather emissions data from company publications. Additionally, each vendor uses its own methodology to estimate emissions per company (Scope 1-3) when reported values are not available.

Thomson Reuters EIKON states that it uses three models in order of preference to estimate emissions values where these are not reported: CO2 model; Energy model, and; Median model.¹³

- The CO2 model uses emissions data for the company for the previous year(s), adjusting for changes in revenue and number of employees, to estimate the emissions for the current year.
- When it is not possible to apply the CO2 model, the Energy model is used. The Energy model uses energy consumed (or energy produced for electric utility companies), adjusted for number of employees and revenue, compared with sector peers on the basis of 8, 6, 4 or 2 digit Thomson Reuters Business Classification (TRBC) codes. Selection of TRBC level depends on number of available energy consumption ratios per relevant level.
- When it is not possible to apply the Energy model, the Median model is used. The Median model is similar to the Energy model as its basis its estimations on sector peers. Firstly, the CO2 emissions per employee are calculated for all industry peers on the basis of 8, 6, 4 or 2 digit TRBC codes. Selection of TRBC level depends on number of available energy consumption ratios per relevant level. The median of all these companies is then applied to the company for which CO2 emissions are missing. The same process is then carried out for CO2 emissions per revenue, i.e. CO2 emissions per dollar revenue are calculated for all industry peers on the basis of 8, 6, 4 or 2 digit TRBC codes. The median of all these companies is then applied to the company for which CO2 emissions are missing. The average of these two figures – estimated CO2 emissions for total employees and estimated CO2 emissions for total revenues – is then taken as the estimated CO2 emissions for the company in question.¹⁴

Bloomberg uses its own proprietary approach to estimate emissions per company where reported CO2 emissions are not available.

This research used – in order of preference – CDP data, Thomson Reuters EIKON data, and Bloomberg data. Where data was missing for the current year (either 2015 or 2018), emissions data from the previous year or two years depending on availability was used. These figures were then adjusted for changes in the number of employees and total revenues. The CO2 per employee and CO2 per dollar revenue were calculated for the year for which data was available. These ratios were then applied to the figures for the number of employees and total revenues for the current year, and the average of these figures was taken as the estimated CO2 emissions for the current year.

Where there was no emissions data available from CDP, Thomson Reuters EIKON, or Bloomberg, a median model approach was used on the basis of the available data from CDP, Thomson Reuters EIKON and Bloomberg. CO2 emissions per employee and per dollar revenue ratios were calculated for all companies for which there was data available in the dataset built using CDP, Thomson Reuters EIKON and Bloomberg data. These ratios were then applied to companies for which emissions data was missing the TRBC 8 or 6 levels – industry or industry group – depending on the number of available ratios – if there were 10 or more ratios then TRBC 8 digit level was used, otherwise the 6 digit level was used. The 4 and 2 levels – business sector and economic sector – were not used as these are considered far too broad to make reasonably accurate estimations of CO2 emissions at the company level. In cases where there were insufficient ratios within the compiled dataset, further emissions data for other companies was gathered from Thomson Reuters EIKON.

1.2.3 National level data

Data on GHG emissions per sector were collected for each country. For EU member states this data was collected from Eurostat, for the United States it was retrieved from the EPA. EPA emissions data for the United States did not specify direct scope 1 emissions. These are therefore included in the scope 3 emission figure.

For a number of countries in ABP's sovereign bond portfolio – e.g. Brazil, Indonesia, Japan and Mexico – this research could not identify data that was up-to-date for the years 2015 and 2018, and was sufficiently detailed and standardized to be adequately used for the purposes of this study. Together, these countries account for 3% of ABP's sovereign bond portfolio in 2015 and 97% in 2018, in so far these portfolios are included in the top-100 lists of ABP investments. Based on the detailed estimates for the European countries and the US, average attribution factors for Scope 1, Scope 2 and Scope 3 emissions were determined. These average attribution factors were then applied to ABP holdings of sovereign bonds issued by countries for which data was missing.

1.3 Discussion on methodological problems

In applying the PCAF methodology to the investments of ABP, a number of problems became apparent, relating to the availability of data needed to apply the methodology and the methodologies through which these data are determined. The problems encountered are discussed in the following sub-sections.

1.3.1 Identification of equities, bonds and real estate portfolio

For both listed equities and corporate bonds, ABP only discloses the name of the company and the invested value. It doesn't provide identifiers such as ISIN, SEDOLs, Bloomberg tickers or the like. As mentioned above, as ABP didn't disclose its bond ISINs it was not possible to normalize the 2018 bond portfolio of 2015 positions. Moreover, in a number of cases it was not possible to identify a bond ISIN for the company listed in ABP's disclosure. Similarly, for a small number of equity investments an ISIN could not be identified, and/or the company in question appeared to no longer be listed on a stock exchange. This may be because the company had merged with another, or because it was delisted. Disclosure of ISINs by ABP would facilitate this verification process.

As mentioned in section 1.1.4 emissions for approximately a quarter of ABP's real estate portfolio could not be calculated due to a lack of data. Moreover, due to the lack of detail in ABP's real estate portfolio disclosures, the detailed PCAF approach of calculating emissions could not be applied. As a result, only the more general company level approach could be used.

1.3.2 Determination of enterprise value

In the PCAF methodology for corporate bonds and listed equities the enterprise value is the key denominator in calculating the attribution factor for the relevant financial institution – ABP in the case of this study. However, when conducting the analysis for this current research, a number of issues relating to the enterprise value arose:

- Negative enterprise value: In approximately 60 ABP positions – both bond- and shareholdings – in both 2015 and 2018 the financial data providers listed a negative enterprise value. This would create a negative attribution factor, which is of course not possible. In the PCAF methodology report negative enterprise value is noted as an issue, however, it is not adequately described how the issue is resolved, “EV was negative in the case of several financial institutions, which needed further tweaking in a handful cases to prevent undesired tilts in the results”.¹⁵

As enterprise value is composed of Market capitalization + Total borrowings + Minority interest – Cash and Cash equivalents, this research opted to exclude Cash and Cash Equivalents from the calculation of enterprise value for financial institutions.

- Missing enterprise value: In a number of cases the financial data service providers did not have an enterprise value for a company, or the component elements of enterprise value. As such, an attribution factor for ABP could not be calculated for these positions. For 2018, attributable emissions for 74 of 4,538 positions (€1,974 million of €180,720 million) could not be calculated due to missing enterprise value data and its component elements. For 2015, attributable emissions of 94 of 4,251 positions (€697 million of €145,036 million), could not be calculated due to missing enterprise value data and its component elements.

In other cases, the financial data service providers did not have enterprise values, however did have data on the component elements. In such cases, the enterprise value was calculated (Market capitalization + Total borrowings + Minority interest – Cash and Cash equivalents). There were also instances where either the Market capitalization was missing (e.g. in the case of bonds), or the Total borrowings was missing. In such instances, the enterprise value was approximated by doubling the value that was present, e.g. Total borrowings if Market capitalization was missing. This was done with logic of applying equal ownership to equity investors and debt financiers as a fair approximation with the understanding that the actual composition varies significantly per company.

- Enterprise value less than ABP invested value: In a small number of cases, the enterprise value as provided by the financial data service providers or calculated enterprise value was less than ABP’s invested value. The result was an attribution factor of over 100%. In such cases, the issue was often related to a factor differential. The enterprise value was further adjusted by dividing by a factor of approximately 100 to result in an attribution factor of between 1% and 5% with the understanding that the pension fund would likely not hold significant stakes in these companies.

These issues with the enterprise value lead one to wonder how ABP dealt with these issues. As the denominator the attribution factor is dependent on the enterprise value. Adjustments made to the enterprise value can increase or decrease the attribution factor and therewith the attributable emissions of ABP. Therefore, transparency on its approach to attribution factor calculations, or even full disclosure of its attribution factor per position potentially including emissions per position, would be key in monitoring and verifying progress on ABP’s attributable emissions reduction targets.

1.3.3 Assessing the government share in the output of different sectors

Crucial to applying the PCAF methodology for sovereign bonds is the assessment of the share of the government in the output of the sectors composing a national economy. Input-Output tables are used for this purpose, but these are not standardized globally, using very different sector break-downs. For European countries, Eurostat provides standardized data using the NACE break-down. But these data are not updated regularly, the most recent data were available for 2015. In our calculations, the same Input-Output tables were therefore used for 2015 and 2018, which is not ideal.

For other countries, the World Input-Output Database (WIOD) also offers Input-Output tables based on the NACE sector break-down, but the most recent data cover 2014 and not all countries in ABP's sovereign bond portfolio are covered. For most countries national sources, regional sources (such as the Asian Development Bank) or international sources such as the OECD are available for input-output tables. But all these sources use other sector break-downs, which make it difficult to compare especially Scope 1 and Scope 2 estimates.

1.3.4 Emissions estimation methodology

There are a number of issues related to emissions estimations methodologies. The first issue relates to self-reporting of emissions by companies either in their own company publications or to initiatives such as CDP. How each company calculates its emissions may differ significantly, particularly scope 2 and scope 3 emissions. There is not one standardized approach. This implies that companies cannot be compared with each other, because it is like comparing apples (calculation model A) with pears (calculation model B). Moreover, in many cases, these emissions disclosures and emissions calculations methodologies of companies are not independently audited or verified similar to how their financial statements and processes are audited. This means that the quality and veracity of the outcomes of the different calculation models cannot be assured. These potential issues with company self-reporting of emissions also has consequences for estimation models used by data service providers as self-reported figures are data inputs for these models.

Another issue related to emissions estimations methodologies is that different data service providers use a variety of different models estimate company emissions where these company have not reported figures. A brief analysis of the dataset prepared for the analysis of ABP's portfolio CO2 footprint shows significant differences between data providers. In some cases the differences are about 5-25%, however, when the emissions figures are double digit millions, then a 5% difference still implies a difference of a million or so tCO₂e. However, there were also cases where the differences were more than 100% or more. Furthermore, there were also significant differences between a self-reported values (from CDP) and a data service provider estimated values of similar proportions. Outcomes of attributable CO₂ emissions analysis will therefore differ significantly depending on which data service providers are used.

Further, there are a number of issues related to industry classifications. An important issue of using industry classification codes to estimate emissions data where this is missing relates to how industry classifications are applied to special purpose financing vehicles. This is most relevant for the companies issuing bonds in this current research, but also applies to companies attracting loans in the case of banks. An analysis of the dataset developed to analyse ABP's portfolio shows that in some cases the data providers apply the industry classification of the parent company to the special purpose vehicle, e.g. Food Retail. In other cases, it applies the industry classification for financial sector actors, e.g. Specialized Finance or Other Diversified Financial Services. This has a significant impact when estimating the emissions of the company in question on the basis of its industry classification as emissions data from companies in the financial sector is applied rather than from companies in the oil & gas sector or the food retail sector, for example.

Some data service providers may estimate the company emissions at a too distant level. For example, Thomson states that it uses sector averages at 8, 6, 4 or 2 digit code levels depending on the number of ratios available. However, the 4 and 2 digit codes are for business sector and economic sector. At the 2 digit code, for example, companies active in sectors as divergent as steel manufacturing, packaging, gold and chemicals are included. The average emissions from these sectors differ significantly and cannot be applied across the board.

Finally, the use of industry classifications and sector averages does not take into consideration the differences between companies with regard to the emissions reduction technologies they use either voluntarily or because they are subject different regulations in different jurisdictions.

Nevertheless, until there is a standardized approach that is independently verified and audited, investors and researchers will have to rely on the plethora of data sources that are available to them, bearing in mind that the outcomes of carbon foot printing analyses may differ significantly depending on which data sources are used.

1.3.5 GHG emissions per economic industry

GHG emissions data per industry are also not standardized globally. Eurostat provides data based on the NACE sector break-down, which makes it well possible to combine with the Input-Output tables. Data are available up to 2017, so for the 2018 estimates in this study we used 2017 data. For other countries, sources with data on GHG emissions per sector use other sector break-downs which makes comparison between countries difficult. Often, the GHG emission sector break-downs are also not aligned with the sector break-downs of the Input-Output tables for the same country, which makes it difficult to combine them.

1.3.6 Scope 3 emissions

As mentioned above, companies themselves determine which scope 3 emissions to include in their inventory, i.e. how they define their operational boundaries. This has a number of implications. Firstly, there are differences between companies active the same sector in terms of what they consider their operational boundaries. This makes accurate comparison between companies impossible. For example, some financial service actor may not include their financed emissions through their investments (category 15 Investments, see 1.2.1), even though the Task Force on Climate-related Financial Disclosures encourages. Or they may not report on all categories of their financial relations – e.g. issuance underwriting may not be included, while investments in equities are. The PCAF methodology is intended to assist financial institutions to fulfil their reporting of scope 3 emissions.

Secondly, there may be a degree of double counting of scope 3 emissions among actors. For example, in the category 11 Use of sold products, oil & gas companies, steel manufacturers, and auto manufacturers may all be reporting scope 3 emissions attributable to this category. This is inherent in the methodology and cannot be corrected.

Chapter 2 Findings

2.1 Overview

The analysis of ABP's attributable CO₂ emissions from the portfolio of its investments has found that the total emissions from all four asset classes – equity investments, corporate bonds, sovereign bonds, and real estate – has decreased by 9.5% from 108 million tCO₂e in 2015 to 97 million tCO₂e in 2018. The decrease in emissions is mainly driven by reductions in attributable emissions from the corporate bond and equity investment portfolios. There were increases in attributable emissions from the sovereign bond and real estate portfolios. When scope 3 emissions are not included from the analysis, there is a reduction of 21% of scope 1 and scope 2 emissions from 37 million tCO₂e to 29 million tCO₂e. Scope 1 emissions decreased approximately 2.7 million tCO₂e from 2015 to 2018, while scope 2 emissions declined by 5.2 million tCO₂e. Scope 3 emissions saw a decline of approximately 2.4 million tCO₂e.

Figure 3 ABP attributable CO₂ emissions from all asset classes (2015 & 2018, million tCO₂e)

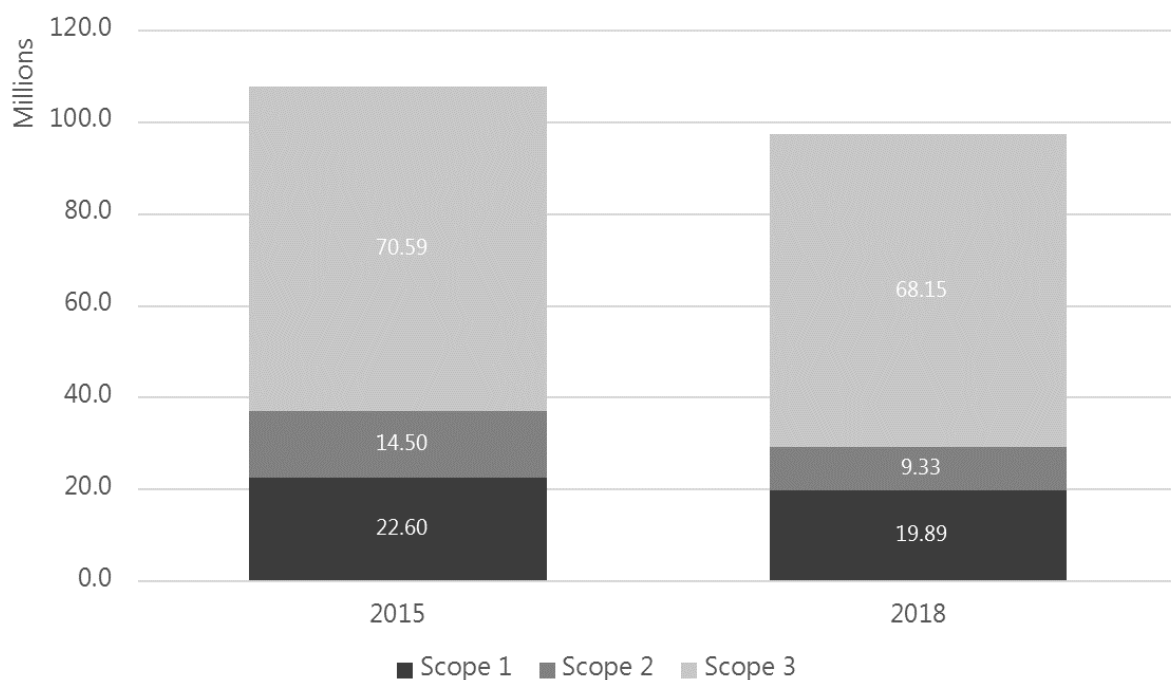
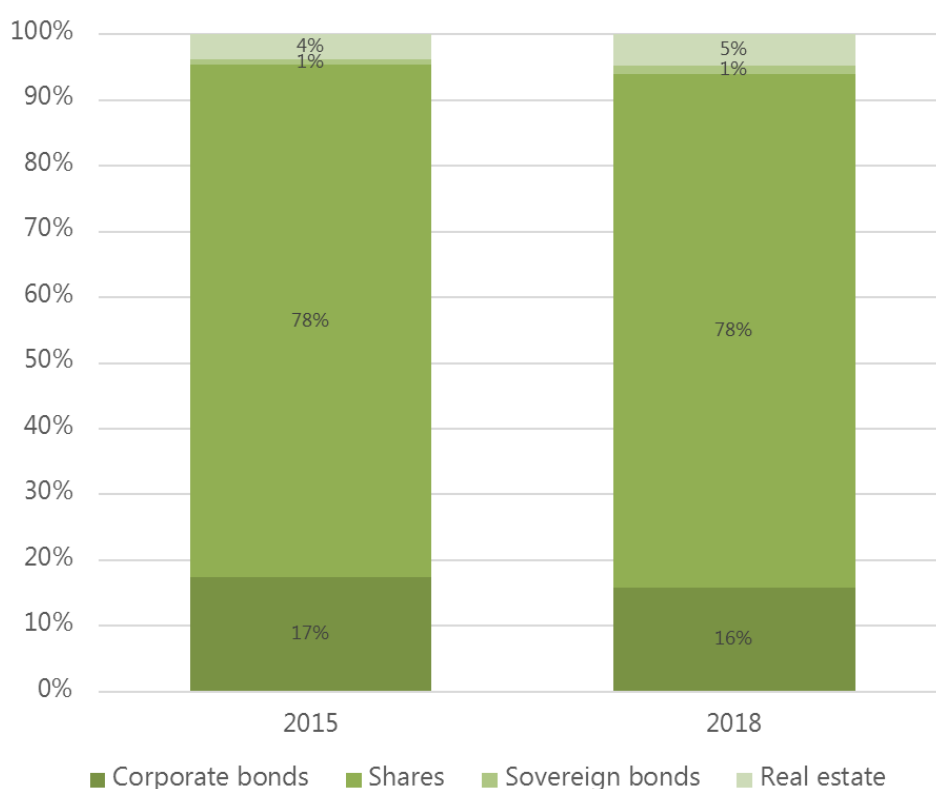


Figure 4 shows that the proportions of emissions attributable to the four asset classes remained relatively stable. The vast majority of ABP's attributable emissions were generated by its equity investment portfolio, followed by its corporate bond portfolio. Emissions from sovereign bonds and real estate accounted for 1% and 5% respectively of the total ABP emissions in 2018.

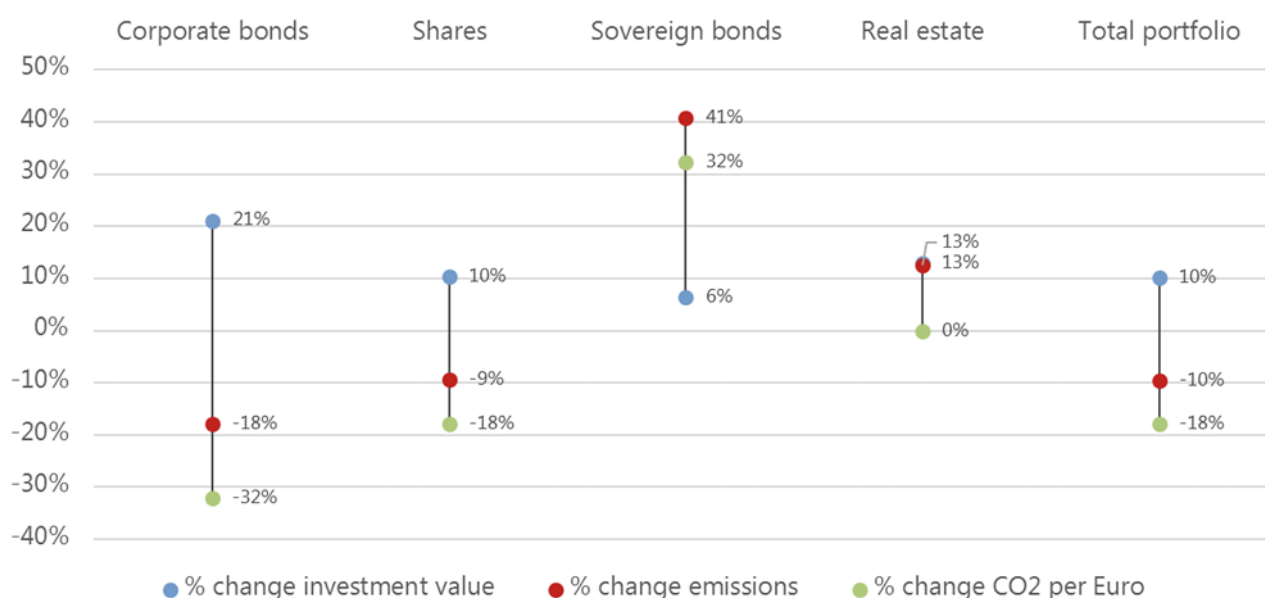
Figure 4 Proportion of ABP attributable emissions per asset class (2015-2018)



ABP's invested value considered in this research increased 10.1% between 2015 and 2018. As mentioned above, the total portfolio emissions decreased by 9.6%, as a result there is a reduction of relative emissions (CO2 per Euro invested) of 18%. This trend is also observed for ABP's most important asset classes – equity investments and corporate bonds (see Figure 5). There was an 21% increase in investments in corporate bonds, and an 18% reduction in emissions attributable to ABP's bond portfolio. As result CO2 per Euro decreased by 32%. ABP's share portfolio – normalized for 2015 positions – increased by 10%, however, emissions decreased by 9%. This resulted in 18% reduction in relative CO2 emissions per Euro.

As noted above, emissions from ABP's sovereign bond portfolio increased by 41%. However, the value of its sovereign bond portfolio – identified in its top 100 holdings disclosure – only increased by 6%. As result, the relative emissions from its sovereign bond portfolio increased by 32%. The value of assessed investments in real estate increased by 13%, emissions attributable to these investments also increased by 13%. Therefore, the relative emissions per invested Euro in this asset class remained the same.

Figure 5 All assessed asset classes: Analysis of change in emissions



2.2 Equity investments

Figure 6 presents the scope 1-3 emissions of ABP's equity investment portfolio. It shows that the total emissions decreased by approximately 9 % from 84 million tCO₂e in 2015 to 76 million tCO₂e in 2018. Scope 1 emissions declined by 27% from 16.3 million tCO₂e in 2015 to 11.8 million tCO₂e in 2018. Scope 2 emissions decreased by 40% from 9.8 million tCO₂e to 5.9 million tCO₂e. Scope 3 emissions remained relatively stable. This study found that the overall decrease of scope 1 and 2 emissions, was approximately 32%. This is a larger decrease than that reported by ABP. The differences are explained by slight differences in methodology related to emissions data and attribution factors (see section 1.2).

Companies in the oil & gas sector – including companies such as BP, Shell and Exxon Mobil – contributed the most to the equity portfolio emissions of ABP, at approximately 29 million tCO₂e in 2018, accounting for 38% of ABP's total equity portfolio emissions. From 2015 to 2018 there was a 21% increase in the total emissions generated by oil & gas companies in ABP's equity portfolio (see Figure 7). Similarly, emissions from companies engaged in natural gas utilities – such as Tokyo Gas, UGI Corp and GAIL India – increased by 75% between 2015 and 2018 to approximately 1.2 million tCO₂e.

Figure 6 ABP equity investment CO2 emissions (2015 & 2018, million tCO2e)

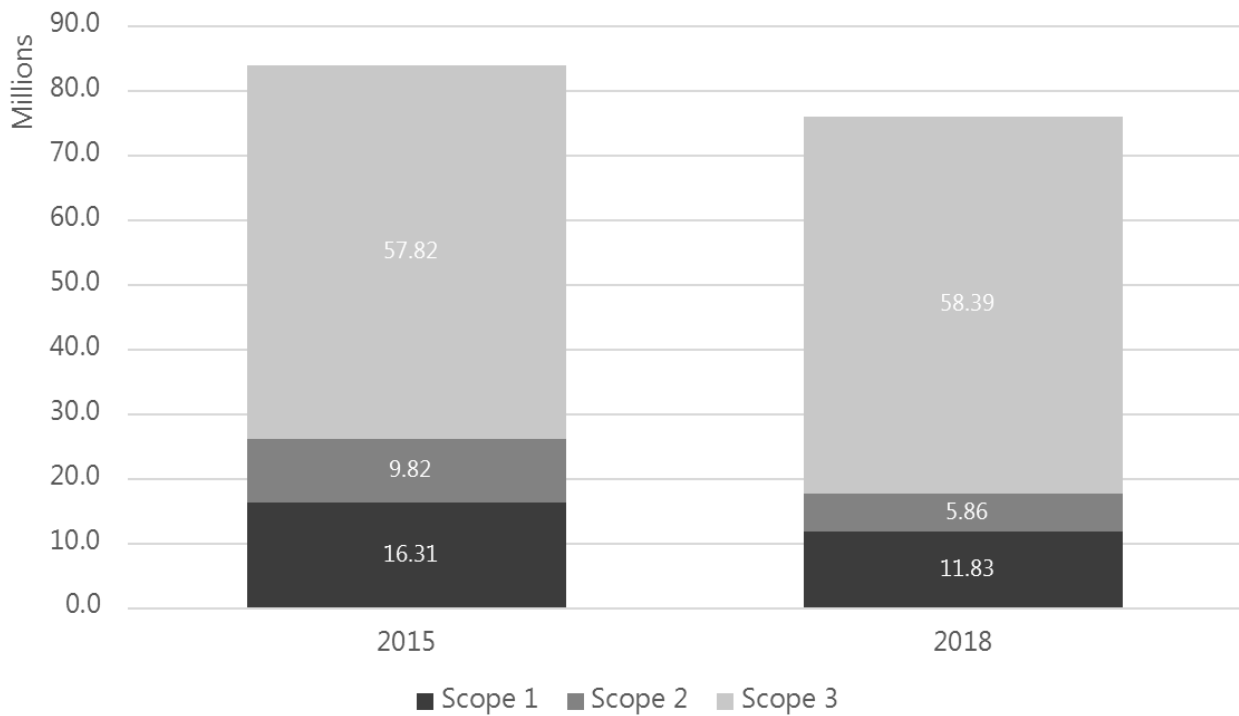
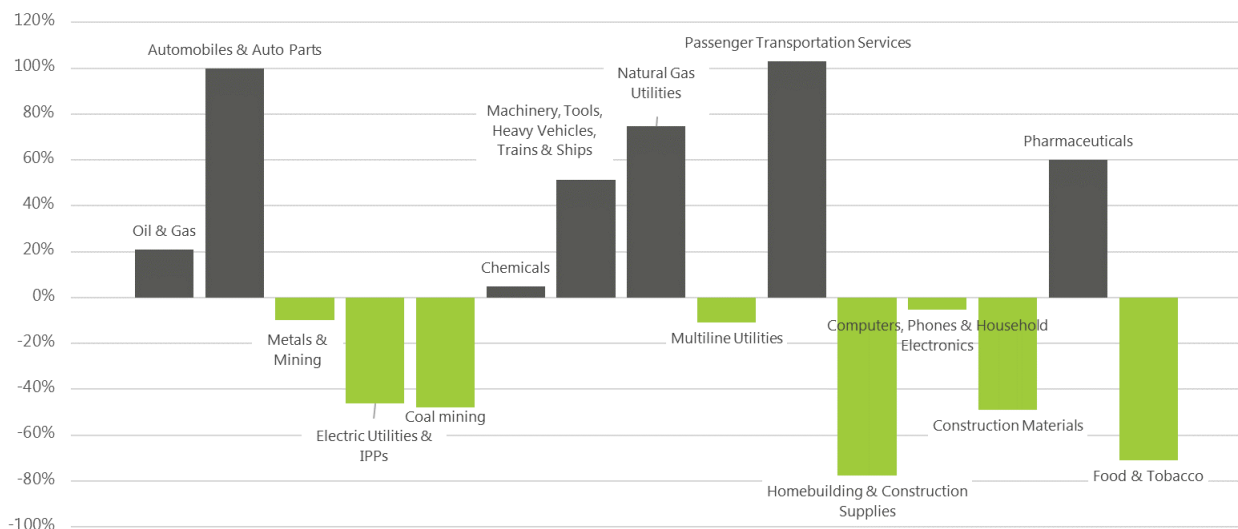


Figure 7 Changes in ABP attributable total emissions from its equity portfolio

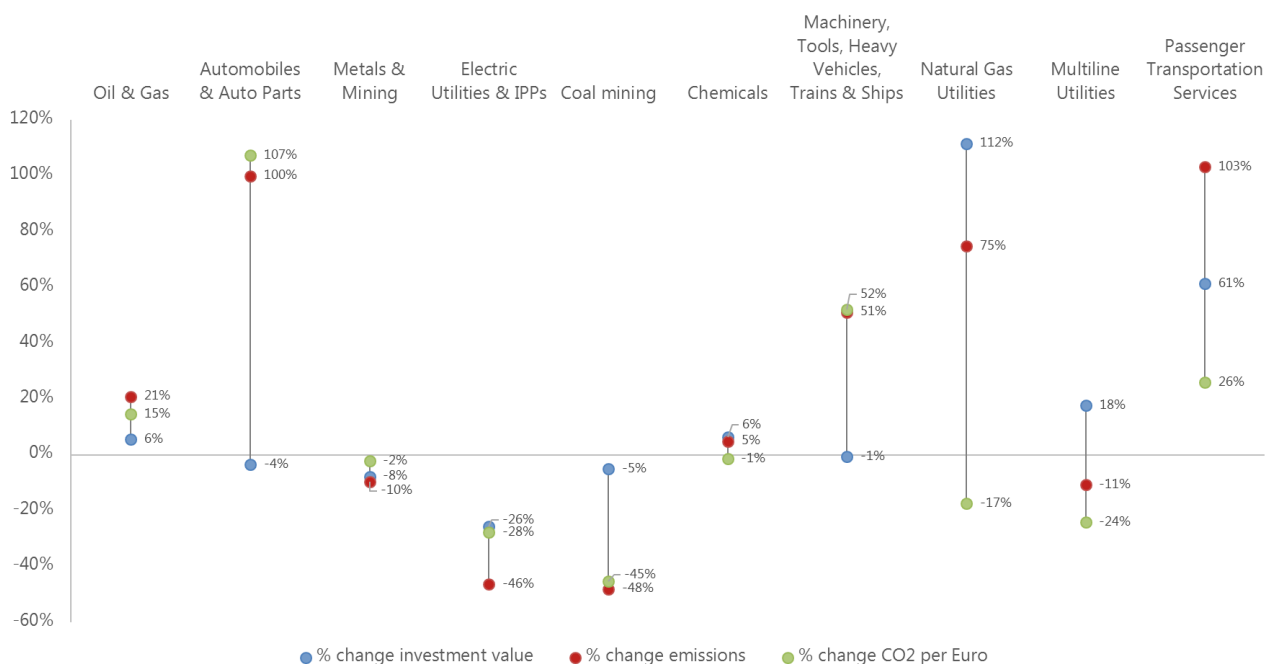


ABP's attributable emissions from coal mining companies such as Glencore and Whitehaven Coal halved in the same period, to approximately 2.8 million tCO2e in 2018. This indicates a potential divestment from the sector. Similarly, emissions from companies engaged in electric utilities also decreased by slightly less than half to approximately 3 million tCO2e. This may be driven by changes in the electricity generating portfolios of the utility companies, a shift of ABP utility investments to companies with lower CO2 emissions, or a combination of both.

Companies active in the oil & gas sector, electric utility sector, multiline utility sector, coal mining sector and natural gas utility sector accounted for approximately 51% of ABP's total equity portfolio emissions in 2018. This is relatively stable compared to 2015 when these companies accounted for approximately 49 % of ABP's equity investment related emissions.

Emissions attributable to ABP's investments in automobile manufacturers – such as Daimler, Peugeot and Mazda – doubled in the period 2015 to 2018, to around 11.2 million tCO₂e. The highest emissions from this sector are Scope 3 emissions – accounting for approximately 98% of the total emissions from the sector – although it should be noted that approximately 80% of the total emissions of the oil & gas sector are scope 3 emissions. Scope 3 emissions are excluded from ABP's own assessments. Emissions from companies engaged in machinery, tools, heavy vehicles, trains & ships – such as Schneider Electric, Ingersoll-Rand and ABB – increased by approximately 50% from 1.8 million tCO₂e to 2.7 million tCO₂e. As with automobile manufacturers, more than 95% of the total emissions from this sector are scope 3 emissions. Emissions from companies active in the passenger transportation services – primarily airlines – doubled from 0.6 million tCO₂e to 1.2 million tCO₂e.

Figure 8 Equity investments: Analysis of change in emissions per sector



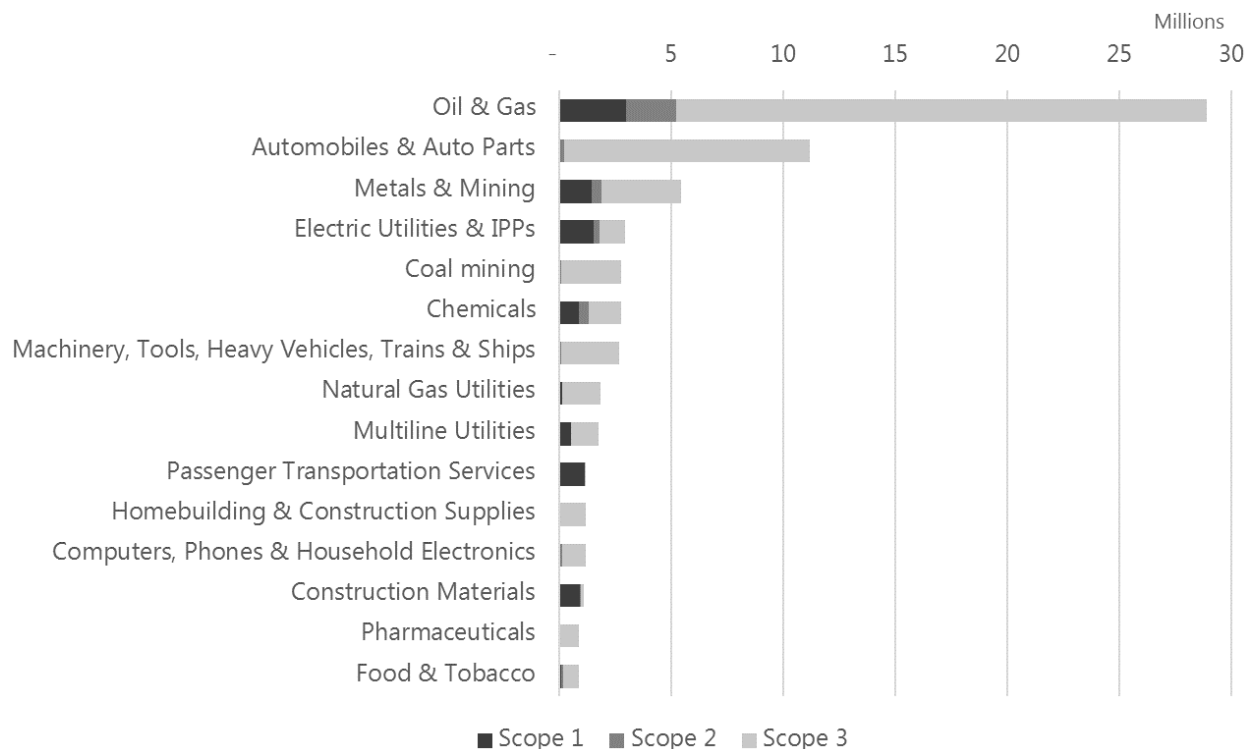
A deeper analysis of the correlations between invested values and emissions per sector provides further details (see Figure 8). As mentioned above, there was 21% increase in emissions attributable to the oil & gas sector. However, there was also a 6% increase in investments in the sector. As a result, the relative emissions increased by 15%, indicating that investments were made in companies with more emissions.

On the other hand, investments in coal mining – including companies such as Glencore, Inner Mongolia Yitai Coal, China Shenhua Energy and Coal India – decreased by 5%, while emissions attributable to the sector decreased by 48%, resulting in a 45% reduction in relative emissions. This indicates that divestments were made from the worst polluters in the sector. A similar trend is observed in investments in companies active in electric utilities. There was a 26% decrease in investments in these companies, while emissions reduced by 46%. Relative emissions decreased by 28%. This again indicates that companies with higher emissions were removed from ABP's portfolio, or these utility companies reduced their emissions through a restructuring of their generation portfolio. Similarly, ABP reduced its investments in metals & mining companies – such as Rio Tinto and BHP Billiton – by 8%, while absolute attributable emissions from the sector decreased by 10%, resulting in a 2% decrease in relative emissions. Again indicating that ABP divested from companies with the highest emissions.

A different trend is observed with ABP's investments in natural gas utilities. Investments increased by 112%, absolute attributable emissions increased by 75%, resulting in a decrease in relative emissions of 17%. Investments in multiline utilities – such as Centrica, Engie and Ameren – saw a similar pattern. The value of ABP's investments in the sector increased by 18%, while there was an overall reduction in attributable emissions of 11%. This resulted in a decrease in relative emissions of 24%.

Emissions attributable to passenger transportation services increased at a faster pace (103%) than the increase in investments in the sector (61%). Relative emissions in the sector increased by 26%. Indicating investment in companies with higher emissions. ABP's investments in companies active in the production of automobiles and auto parts decreased from 2015 to 2018. However, attributable emissions from the sector increased by 100%, resulting in an increase in relative emissions of 107%. Again indicating an increase in investments of higher emitters.

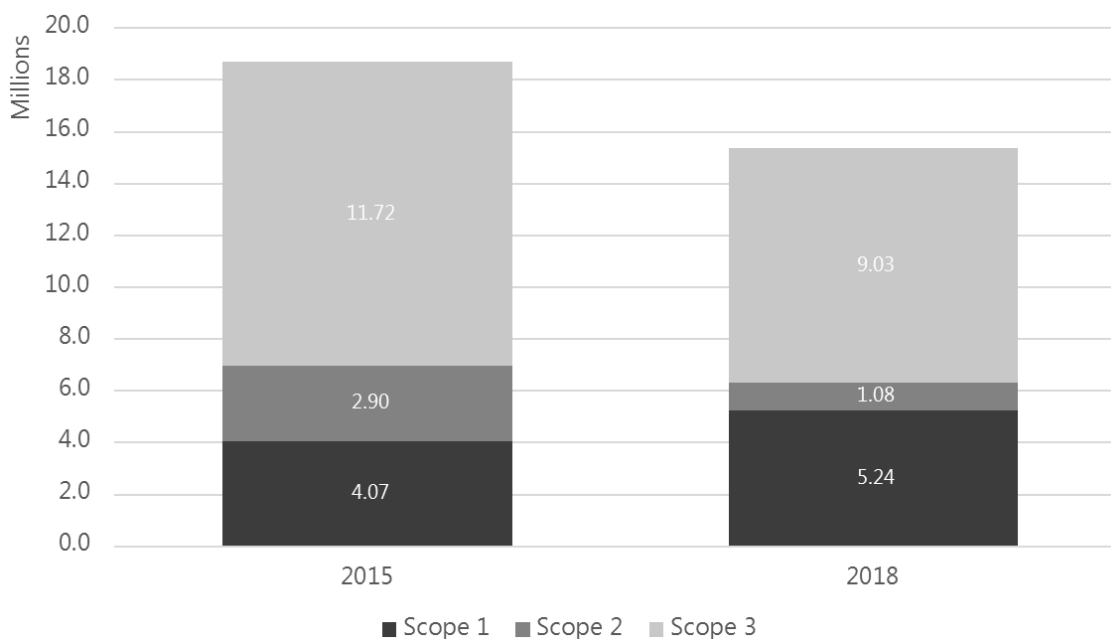
Figure 9 2018 ABP attributable emissions per industry group in equity portfolio



2.3 Corporate bond investments

Figure 10 presents the scope 1-3 emissions of ABP's corporate bonds investment portfolio. It shows that total emissions decreased 18% from approximately 18.7 million tCO₂e in 2015 to 15.4 million tCO₂e in 2018. Scope 1 emissions increased 22% from 4.1 million tCO₂e to 5.2 million tCO₂e. However, both scope 2 emissions and scope 3 emissions decreased from 2.9 million tCO₂e to 1.1 million tCO₂e, and 11.8 million tCO₂e to 9.0 million tCO₂e respectively.

Figure 10 ABP corporate bond investment CO₂ emissions (2015 & 2018, million tCO₂e)

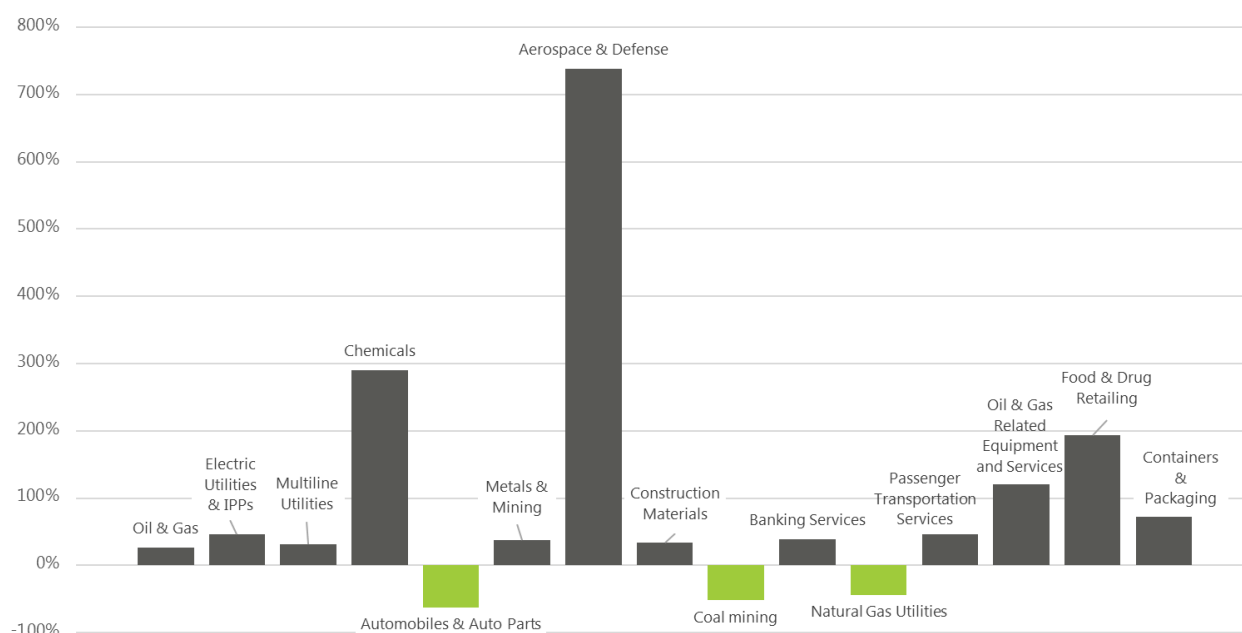


As with ABP's equity portfolio, companies in the oil & gas sector contributed the most to the corporate bond portfolio emissions, at approximately 3.2 million tCO₂e in 2018, accounting for 22% of ABP's total corporate bond portfolio emissions. From 2015 to 2018 there was a 26% increase in the total emissions generated by oil & gas companies in ABP's corporate portfolio. If companies engaged in oil & gas related equipment and services – such as Kinder Morgan, Enbridge and Halliburton – are added, there was a 29% increase in total ABP attributable emissions, from 2.6 million tCO₂e in 2015 to 3.4 million tCO₂e in 2018. ABP's emissions from its corporate bonds of electric utility and multiline utility companies increased by 47% and 31% respectively, taken together they increased 65% from 2.1 million tCO₂e in 2015 to 4.8 million tCO₂e in 2018.

Companies active in the oil & gas sector, electric utility sector, multiline utility sector, coal mining sector and natural gas utility sector account for approximately 59% of ABP's total emissions in 2018. In 2015 companies active in these sectors only accounted for approximately 37% of ABP's corporate bond related emissions.

ABP's emissions from companies active in the coal mining sector – such as Glencore and CNX Resources / CONSOL – halved from 0.52 million tCO₂e in 2015 to 0.25 million tCO₂e in 2018. Emissions from companies active in the natural gas utility sector similarly decreased by almost 50%, from 0.4 million tCO₂e in 2015 to 0.2 million tCO₂e in 2018.

Figure 11 Changes in ABP attributable total emissions from its corporate bond portfolio



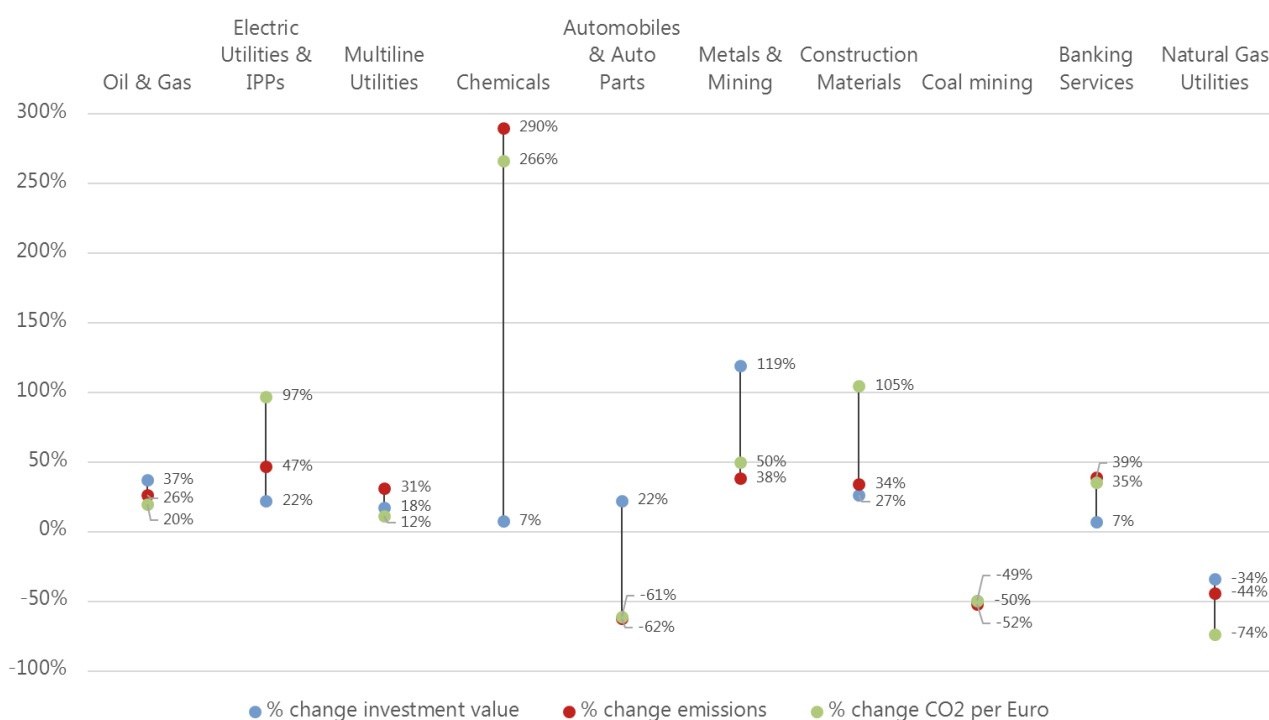
As can be seen in Figure 11 emissions attributable to bonds of companies in the chemical sector – such as Chemours and Dow DuPont – increased by 290%. This is mostly driven by scope 3 emissions by one company (Chemours). This company did not disclose its scope 3 emissions in 2015, where they were then estimated on the basis of industry peers (see 1.2.2). However, this company did disclose its scope three emissions in 2017, which was used for this research. The emissions of aerospace and defence companies - including companies such as United Technologies and Boeing and Airbus supplier Spirit AeroSystems – in ABP’s portfolio also saw an increase in emissions of more than 700%.

Emissions from companies active in the passenger transportation services – primarily airlines – increased by 46% from 0.13 million tCO₂e to 0.19 million tCO₂e.

A closer look at the correlations between invested values and emissions per sector provides further insights (see Figure 12). Contrary to ABP’s equity investments in the oil & gas sector, the value of ABP’s corporate bond investments in the oil & gas increased at a faster pace (37%) than the increase in attributable emissions from the sector (26%). This resulted in an increase of relative emissions of 20%. This indicates that ABP may have invested more selectively in the bonds of companies with lower emissions.

The opposite is true for ABP’s investments in the corporate bonds of companies engaged in electric utilities. ABP increased the value of these investments by 22%, while ABP’s absolute emissions attributable to the sector increased by 47%, resulting in a 97% increase in relative emissions. This indicates that ABP invested more in companies with higher emissions. A similar, but more pronounced trend is observed in other sectors. For example, ABP’s investments in the bonds of companies active in aerospace & defence (not included in Figure 12 as the figures would distort the overall chart) increased by 306%. However, as noted above, emissions from the sector increased by approximately 740%, resulting in an increase in relative emissions of 3,528%. Similarly, the value of investments in construction materials increased by 27%, while absolute attributable emissions increased by 34%. Relative emissions from ABP’s investments in the corporate bonds of companies active in this sector increased 105% indicating an increase in relatively large emitters.

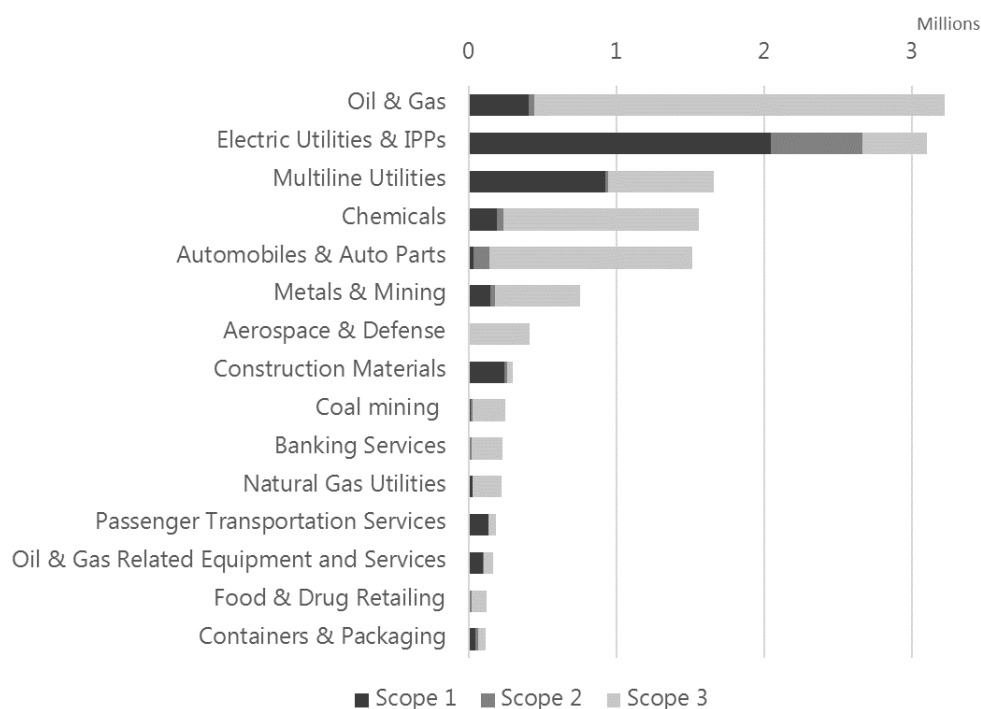
Figure 12 Corporate bond investments: Analysis of change in emissions per sector



ABP's relative emissions from its investments in the corporate bonds of financial institutions – such as HSBC, Bank of America and BNP Paribas – increased by 35%, while the increase in the value of these investments only increased by 7%, as the total attributable emissions from this sector increased by 39%. This indicates, again, that ABP has increased its investments in financial institutions with comparatively higher emissions.

The value, absolute emissions, and therefore relative emissions from ABP's investments in the corporate bonds of companies active in coal mining and natural gas utilities decreased between 2015 and 2018. For natural gas utilities, the more rapid reduction in attributable emissions indicates a divestment from the largest emitters.

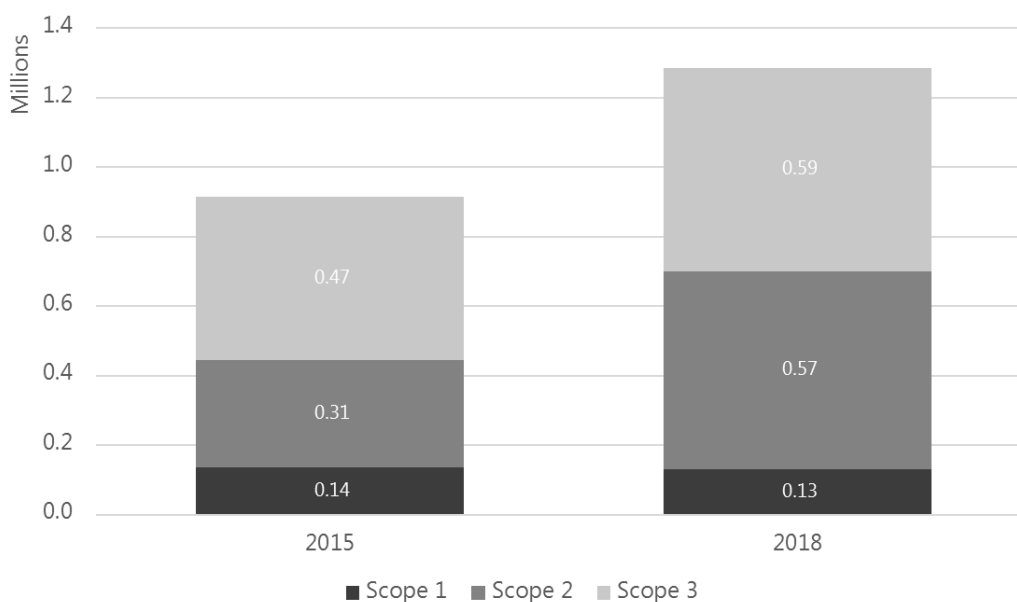
Figure 13 2018 ABP attributable emissions per industry group in corporate bond portfolio



2.4 Sovereign bond investments

Figure 14 presents the scope 1-3 emissions of ABP's sovereign bond portfolio. It shows that the total emissions attributable to the sovereign bond portfolio increased by 41% from 0.9 million tCO₂e in 2015 to 1.3 million tCO₂e in 2018. Scope 1 emissions declined slightly (3%), however, there were significant increases of scope 2 and scope 3 emissions of 84% and 25% respectively. It should be noted that scope 1 emissions for the United States are not reported separately, but are covered by their scope 3 emissions reporting.

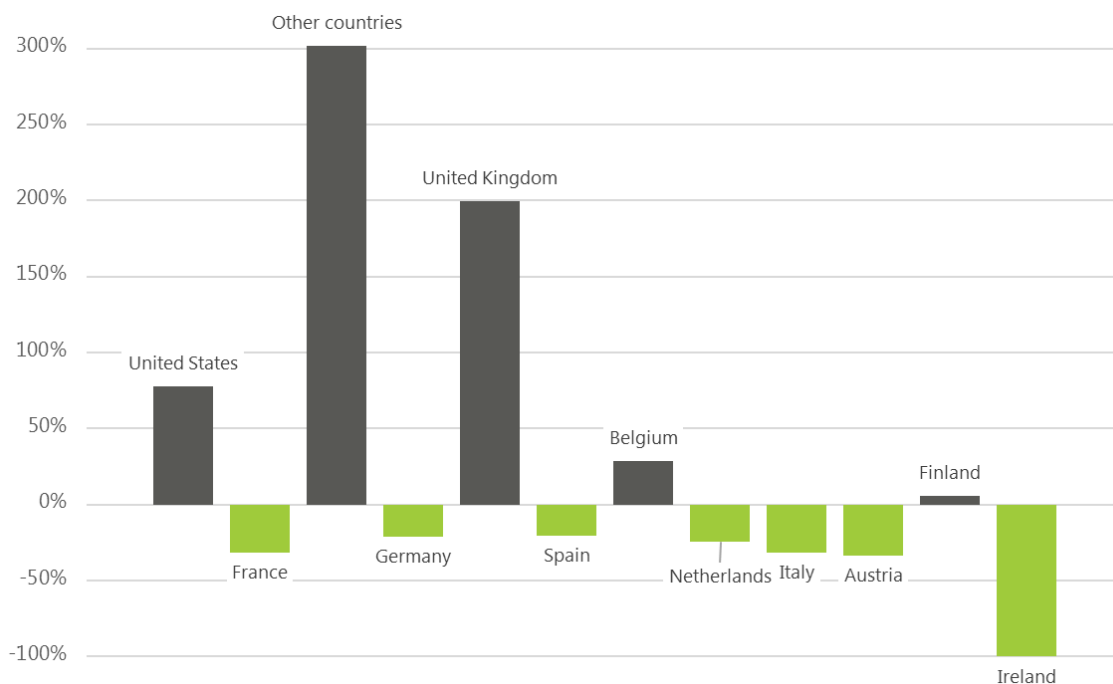
Figure 14 ABP sovereign bond investment CO₂ emissions (2015 & 2018, million tCO₂e)



In 2018, emissions from the United States accounted for 62% of ABP's attributable emissions from its sovereign bond portfolio. This is an increase from 2015 when the United States accounted for 49% of ABP's attributable emissions from its sovereign bond portfolio. ABP has the highest levels of investments in French sovereign bonds, however, these only account for 8.5% of ABP's total attributable emissions from its sovereign bond portfolio.

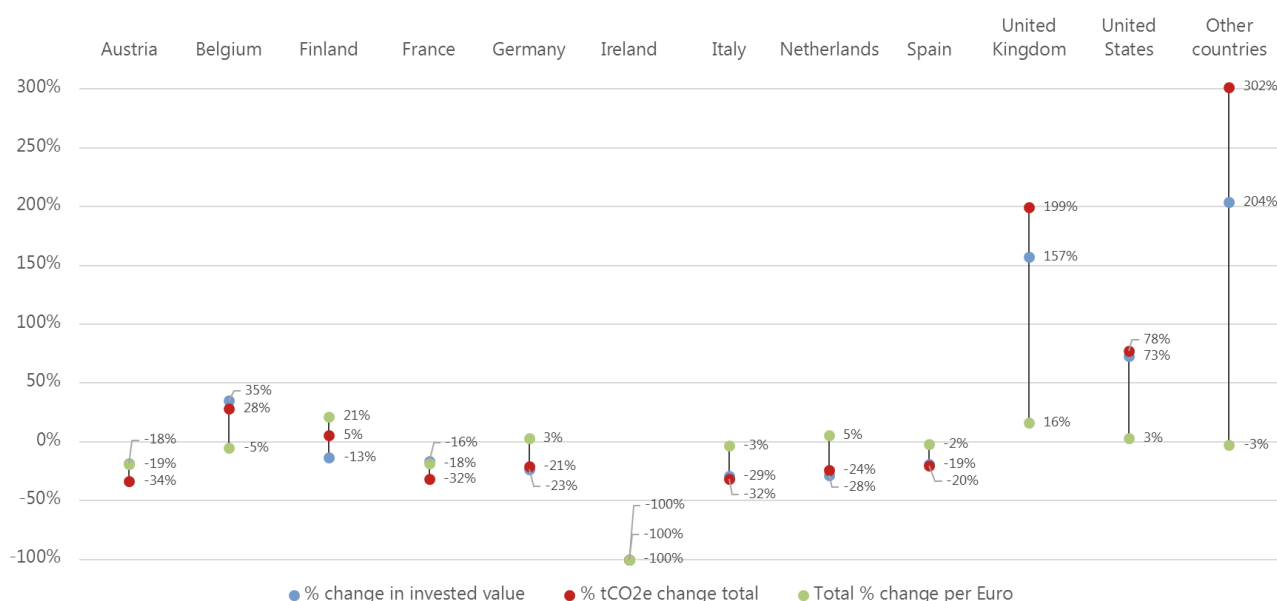
ABP attributable emissions from the United States increased by more than 78% from 0.45 million tCO₂e in 2015, to 0.80 million tCO₂e in 2018 (see Figure 15). Emissions from investments in bonds from the United Kingdom increased by almost 200%, from 0.03 million tCO₂e in 2015 to 0.8 million tCO₂e in 2018. Emissions from other countries – excluding the United States and EU member state, e.g. Canada, Mexico, and Indonesia – increased by approximately 300% from 0.2 million tCO₂e in 2015 to 0.9 million tCO₂e.

Figure 15 Changes in ABP attributable total emissions from its sovereign bond portfolio



ABP attributable emissions from a number of countries decreased. Emissions from French sovereign bonds decreased 32% from 0.16 million tCO₂e in 2015 to 0.11 million tCO₂e in 2018. Emissions from Dutch sovereign bonds decreased by 24% from 0.04 million tCO₂e in 2015 to 0.03 million tCO₂e.

Figure 16 Sovereign bond investments: Analysis of change in emissions per country

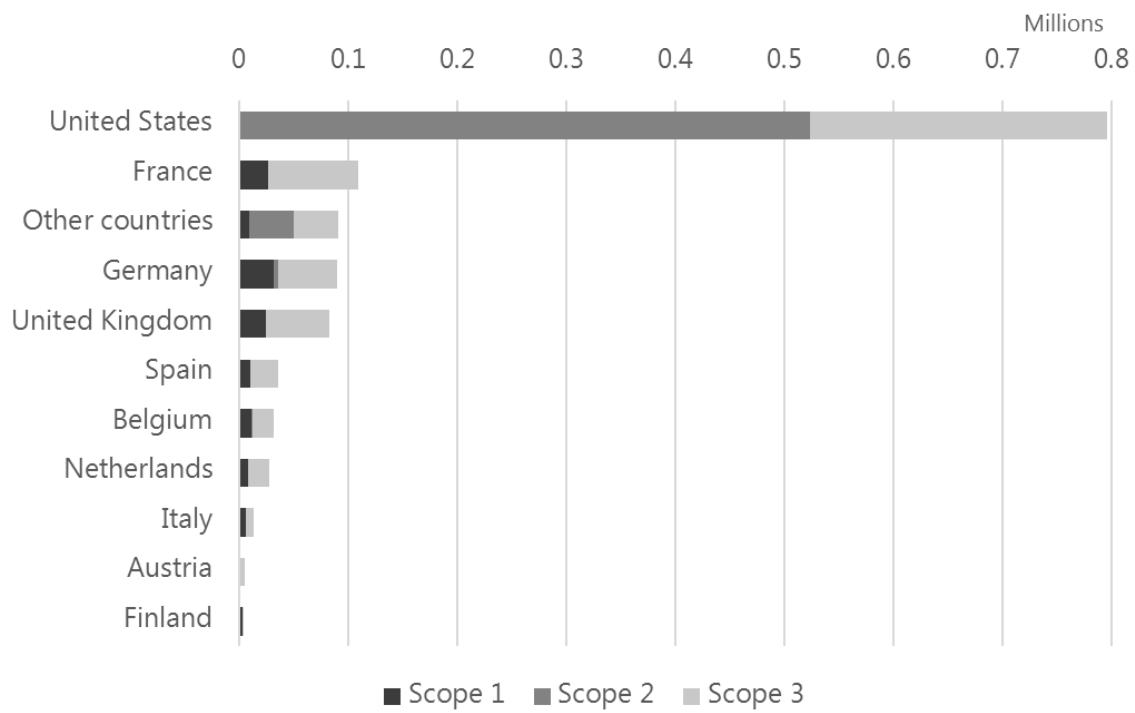


A deeper analysis of the correlations between invested values and emissions per country gives further insights (see Figure 16). As noted above, emissions from Dutch sovereign bonds decreased by 24%, however, investments decreased by 28%. The relative emissions therefore increased by 5%. The value of ABP's investments in French sovereign bonds decreased by 16%, while – as mentioned above – total absolute attributable emissions decreased by 32%. As a result, the relative emissions of French sovereign bonds decreased by 18%.

ABP increased its holdings of the United Kingdom's sovereign bonds by 157%, while total attributable emissions increased by 199%. As a result there was a 16% increase in relative emissions. This is due to an increase in emissions in the UK, and an increase in the attribution factor due to lower UK government debt. Similarly, relative emissions from ABP's investments in sovereign bonds from the United States increased by 3%, as a result of a 73% increase in the value of its investments, and a 78% increase in total attributable emissions. While total US emissions decreased slightly, the attribution factor increased.

Relative emissions from ABP's holdings of the sovereign bonds of Finland increased by 21%, driven by an increase in emissions even though ABP reduced the value of its position in these bonds. The relative emissions from the investments in sovereign bonds of a number of countries decreased, namely: Austria, Belgium, Italy and Spain (the relative emissions from Irish sovereign bonds decreased by 100% because sovereign bonds from this country did not appear in the 2018 Top 100 investments). Among these countries, ABP only increased its investments in the sovereign bonds of Belgium. This indicates a reduction in the total emissions of Belgium, and/or a reduction its attribution factor. For the other countries ABP decreased the value of its investments.

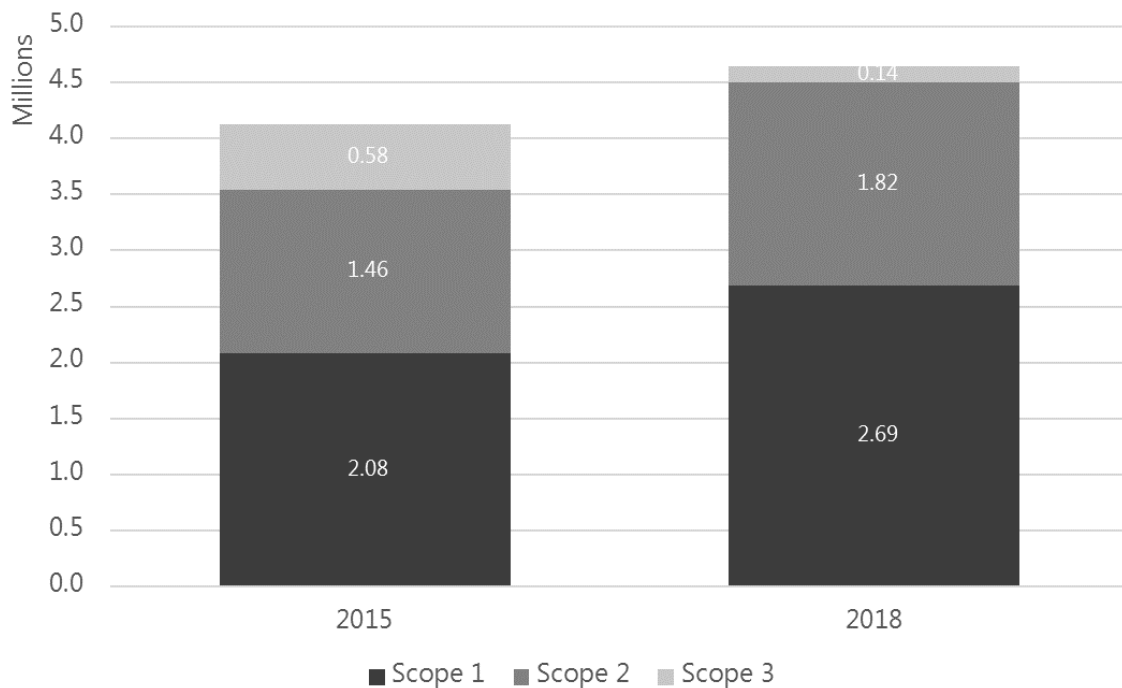
Figure 17 2018 ABP attributable emissions per country in sovereign bond portfolio



2.5 Real estate investments

Attributable emissions from ABP's real estate portfolio increased 13% from 4.1 million tCO₂e in 2015 to 4.6 million tCO₂e in 2018. Scope 3 emissions declined in this period. Scope 1 and scope 2 emissions were the drivers of increased emissions.

Figure 18 ABP real estate CO₂ emissions (2015 & 2018, million tCO₂e)



ABP's assessed investments in real estate increased by 13%, the same pace as the increase in absolute attributable emissions. As a result, there is no change in the relative emissions from ABP's investments in real estate.

Reference

- 1 Platform Carbon Accounting Financials (PCAF) (2018, November), *Harmonising and implementing a carbon accounting approach for the financial sector*, p. 3.
- 2 ABP (2019, April), *Jaarverslag 2018*, p. 32.
- 3 Email correspondence between ABP and Profundo, 19 September 2019.
- 4 Platform Carbon Accounting Financials (PCAF) (2018, November), *Harmonising and implementing a carbon accounting approach for the financial sector*, p. 28.
- 5 ABP (2019, April), *Jaarverslag 2018*, p. 124; ABP (2018, December), *Disclosurelijst bonds ABP Q4 2018 (NL)*.
- 6 Platform Carbon Accounting Financials (PCAF) (2018, November), *Harmonising and implementing a carbon accounting approach for the financial sector*, p. 28.
- 7 Email correspondence between ABP and Profundo, 19 September 2019.
- 8 Platform Carbon Accounting Financials (PCAF) (2018, November), *Harmonising and implementing a carbon accounting approach for the financial sector*, p. 28.
- 9 Carbon Trust (n.d.), "What are scope 3 emissions?", online: <https://www.carbontrust.com/resources/faqs/services/scope-3-indirect-carbon-emissions/>, viewed in July 2019.
- 10 Greenhouse Gas Protocol (2013, April), *Corporate Value Chain (Scope 3) Accounting and Reporting Standard*, World Resources Institute and World Business Council for Sustainable Development: United States of America, p. 32.
- 11 Greenhouse Gas Protocol (2013, April), *Corporate Value Chain (Scope 3) Accounting and Reporting Standard*, World Resources Institute and World Business Council for Sustainable Development: United States of America, p. 32.
- 12 Platform Carbon Accounting Financials (PCAF) (2018, November), *Harmonising and implementing a carbon accounting approach for the financial sector*, p. 28.
- 13 Refinitiv (2019, January), *Thomson Reuters ESG Carbon Data and Estimate Models*, p. 2-3.
- 14 Refinitiv (2019, January), *Thomson Reuters ESG Carbon Data and Estimate Models*, p. 2-3.
- 15 Platform Carbon Accounting Financials (PCAF) (2018, November), *Harmonising and implementing a carbon accounting approach for the financial sector*, p. 47.



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R E S E A R C H & A D V I C E

Radarweg 505
1043 NZ Amsterdam
The Netherlands
+31-20-8208320
profundo@profundo.nl
www.profundo.nl