Carbon footprint disclosure

Analysis of carbon footprint of NN Group's Proprietary Assets

March 2019

NN has measured the carbon footprint of a large portion of our Proprietary Assets since 2017. Carbon footprinting can help us understand carbon-related risks within our investment portfolio, and can also be useful in informing corporate engagement. This report summarises the results and insights from our annual carbon footprint measurement. It also describes the methodology and results of a climate scenario tool that we tested on a part of our portfolio.

Climate change represents an urgent and potentially irreversible threat to livelihoods and the well-being of society. NN Group therefore supports the 2015 Paris Agreement in which governments around the world committed to setting long-term policies with the aim of 'holding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels'.

As an insurer and investor, our business faces both risks and opportunities due to climate change. To effectively measure and evaluate the potential impacts of climate change, we need consistent, comparable, and reliable information. To this end, NN endorsed the recommendations set out by the Financial Stability Board's (FSB) Task Force on Climate-related Financial Disclosures (TCFD) that seeks to improve and harmonise financial disclosures on climate change.

To bring our own disclosures in line with the TCFD recommendations, we have updated our climate-related disclosures in our 2018 NN Group Annual Report. In addition, we provide more detailed information in this report.
- Part I of this report summarises the results and insights from our annually updated carbon footprint of the fixed income and listed equity investments, which we hold in our proprietary investment portfolio
- Part II of this report describes the methodology and results of an analysis that we conducted on our corporate bonds and equities portfolio to test the alignment of certain sectors in our portfolio with different climate scenarios

We have developed a range of policies and tools that help us address climate change in our investments. The integration of environmental, social and governance (ESG) factors help us to factor climate risks and opportunities into our investment decisions. Through voting and engagement, we encourage the companies we invest in to accelerate steps to manage climate risks and improve climate-related disclosures. We exclude sectors from investment (eg oil sands) only after careful consideration, such as when we believe the carbon risks are too high and we cannot make improvements through engagement. Furthermore, NN actively seeks opportunities to increase investments in assets that contribute to renewable energy and resource efficiency.

We will continue to improve our climate disclosures. For example, in 2019, we plan to expand the carbon footprint measurement to include our private real estate and mortgage portfolios. We will also perform a broader climate scenario analysis to help us understand the potential financial impacts of climate change across our portfolio. Finally, we will continue to participate in industry initiatives that seek to develop guidance and tools for reporting in line with TCFD recommendations.

I. Carbon footprint of our Proprietary Assets

To inform and monitor our exposure to carbon risk, NN Group measures the greenhouse gas (GHG) emissions and intensity associated with the underlying holdings of our investment portfolio. This section summarises the results and insights from our annual carbon footprint measurement.

Scope of our carbon footprint disclosure

The carbon footprint of NN Group's proprietary fixed income and listed equity holdings was measured as per 31 December 2018, and is based on the latest available carbon dioxide emissions data for governments and companies. The total assessed amount was EUR 108 billion. This represents 58% of our total asset portfolio which comprises general account assets of the insurance entities, and the assets of NN Bank and NN Group. [1]

Within the assessed fixed income holdings, Government Bonds are the largest category and Corporate Fixed Income securities account for the remainder. The Corporate Fixed Income portfolio comprises mainly corporate bonds, but also asset-backed securities and loans (although the data available for the two asset categories were limited).

The footprint is measured in carbon dioxide equivalents (CO_2e), based on emissions data provided by ISS-Ethix Climate Solutions, a leading carbon data provider.

The coverage, or the percentage of (assessed) portfolio assets for which (actual or estimated) emissions data were available, is: 86%.

Change in methodology

In 2018, we made an important change in the methodology for sovereign bonds. In line with the principles proposed by the Platform Carbon Accounting Financials (PCAF)[2], we now allocate emissions to a sovereign bond by taking into account the emissions that are directly caused by the government's own activity (scope 1, 2 emissions as defined by the Greenhouse Gas Protocol), as well as the emissions from government financing in other sectors within a country (scope 3). This differs from the previous methodology where emissions were allocated to a sovereign bond using a production-based approach reflecting the direct GHG emissions stemming from all domestic production of goods and services within a country. For more background on our approach and methodology, we refer to page 3.

Carbon footprint of NN Group's Proprietary Assets	2018	2017	2016
Assessed Assets under Management (in EUR billion)	108	103	81
Fixed income	104	99	78
Equity	3	4	3
Carbon Footprint (tCO$_2$e/EURm invested)	146	273	309
Fixed income	146	278	316
Equity	153	120	146
Weighted Average Carbon Intensity (tCO$_2$e/EURm of revenue)	107	231	232
Government Bonds	42	233	232
Corporate Bonds	318	276	238
Equity	213	171	260

1   The main asset categories that were not in scope of this carbon footprint analysis included mortgages, real estate, private equity, and cash.

2   The PCAF is a coalition of Dutch financial Institutions, whose objective is to develop a standard that enables financial institutions to measure carbon emissions consistently.

Results

The results indicate that the portfolio carbon footprint is 146 tonnes of CO_2 per EUR million invested, whilst the portfolio weighted average carbon intensity is 107 tonnes of CO_2 per EUR million in revenue[3]. Both metrics decreased compared with the previous year due to the new methodology applied to calculate the absolute emission for sovereign bonds. As described in the previous paragraph, instead of looking at the absolute emission of the country, we based the emission data of government bonds for the 2018 measurement on the government spending and financing structure (PCAF method). We believe that applying the new methodology is a good step forward towards a harmonised method of carbon emission reporting that also reflects the aim of the PCAF.

We separately assessed the Fixed Income and Equity portfolio. The year-on-year changes were mainly due to improvements in data quality, increase in data coverage (86% versus 82% the previous year), and further fine-tuning of methodology.

We have not identified any notable shifts in allocations as main drivers of footprint changes, which is in line with the overall buy-and-hold strategy of our proprietary investment portfolio.

Limitations

This is the third year that NN has measured the carbon footprint of the investment portfolio. We have focused on finetuning and improving the carbon footprint data and calculations, thereby increasing our overall confidence in using the results to support investment decision-making. However, it is important to note that, in our view, carbon footprinting has a number of limitations. The analysis relies on historical data and does not inform exposure to, for example, physical risks from extreme weather events. Therefore, more forward-looking metrics will help to assess and manage climate risks.

Background on methodology and limitations

We performed two types of analysis:
- The **carbon footprint (ownership) approach** highlights an investor's exposure to carbon emissions through its investments. It aims to answer the question: 'how much of the issuers' emissions have we financed with our portfolio?'
- The **intensity approach** seeks to describe the carbon efficiency of underlying entities in the portfolio, by linking the emissions to revenue. The metric we have used is the 'weighted average carbon intensity', which is the main metric recommended by the TCFD. It aims to address the question: 'What is the exposure of a portfolio to carbon-intensive companies?' As such, this metric may provide insight into potential risks related to the transition to a lower-carbon economy.

How did we calculate the metrics?

The **Carbon Footprint** metric, also referred to as portfolio financed emissions, is based on the ownership logic. This means that it follows the reasoning that if an investor owns 1% of an issuer's market capitalisation, 1% of issuer's emissions are allocated to the investor. By aggregating the investor-financed emissions across all companies in the portfolio, we obtained the total carbon footprint for the Equity portfolio. We then divided the figure by the portfolio value to express the carbon footprint in tonnes of CO_2 per EUR million invested.

When buying corporate bonds, investors do not own assets in the companies in which they invest (rather, they are providing a loan). Still, we applied the same ownership logic for the Corporate Fixed Income portfolio, but instead of a portion of a company's market cap, we used a portion of issuer debt.

For the Government Bonds portfolio, the amount of carbon emissions of an individual government that we 'financed' as an investor was calculated based on how much of the country's debt we own, relative to the total debt outstanding of the country. We note that a weakness of this approach is that if the outstanding debt of a country increases, the carbon exposure decreases. This limitation applies to fixed income portfolio footprinting in general.

The **Weighted Average Carbon Intensity** metric seeks to describe the portfolio's exposure to carbon-intensive companies, expressed in tonnes of CO_2 per EUR million in revenue. Each company's emissions are divided by its revenues to obtain the carbon intensity of each holding. The results are averaged using company weights in the portfolio to obtain the overall carbon intensity of the portfolio. For the Government Bonds portfolio, the same approach is applied, but instead of revenues we used Gross Domestic Product (GDP) as the denominator.

Formula:

$$\sum_{n}^{i} \left(\frac{\text{current value of investment } i}{\text{issuer's market capitalization } i} \times \text{issuer's Scope 1 and Scope 2 GHG emissions } i \right) \Big/ \text{Current portfolio value (EUR million)}$$

Formula:

$$\sum_{n}^{i} \left(\frac{\text{current value of investment } i}{\text{current portfolio value}} \times \frac{\text{issuer's Scope 1 and Scope 2 GHG emissions } i}{\text{Issuer's EUR million of revenue } i} \right)$$

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3 All figures in this report are based on Scope 1 & 2 GHG emissions ('direct' emissions, as defined by the Greenhouse Gas Protocol), unless mentioned otherwise.

II. Assessing alignment with climate scenarios

To gain a broader understanding of climate risk and opportunity, we tested the open-source Paris Agreement Capital Transition Assessment (PACTA) tool. This tool - developed by the 2° Investing Initiative - was launched with the support of the Principles for Responsible Investment (PRI) and the California Insurance Commissioner. It aims to measure the alignment of investment portfolios with different climate transition scenarios. This section describes some of our insights.
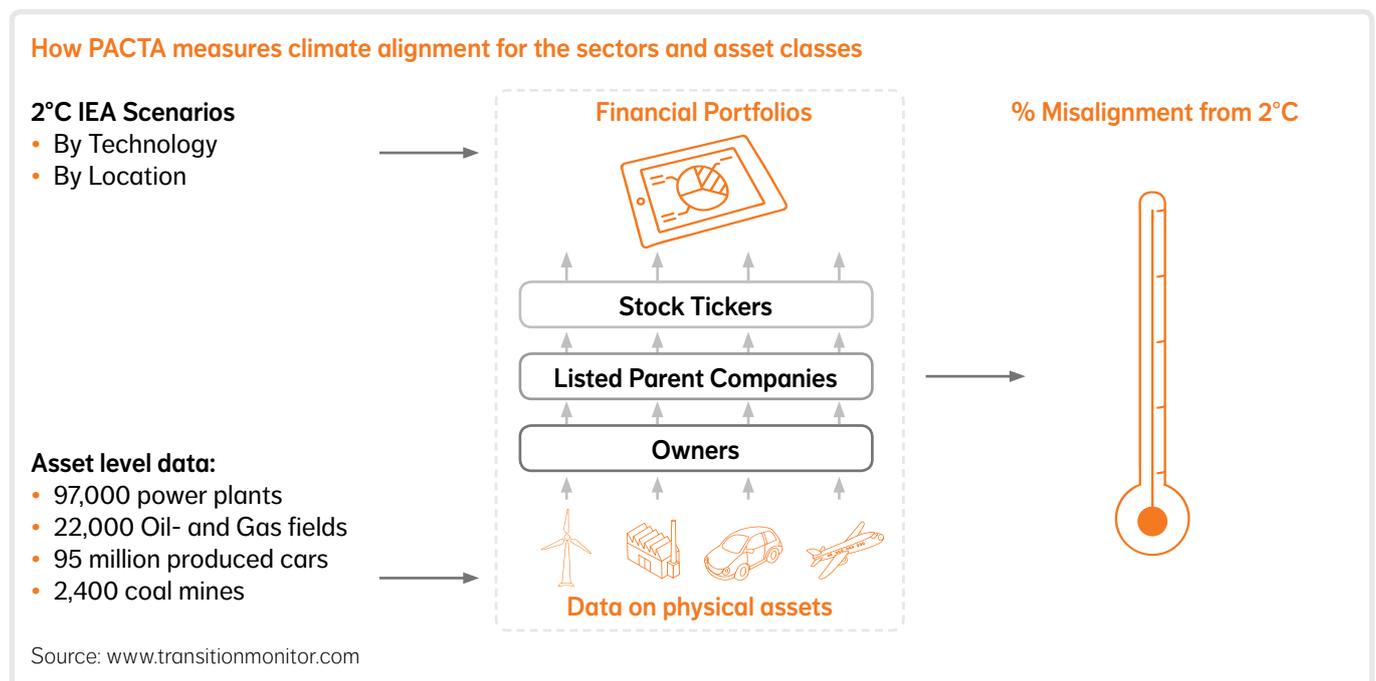
Methodology

The PACTA tool has a global scope and provides a forward-looking analysis for the following three high carbon sectors: fossil fuel (oil & gas production, and coal mining), power generation, and automotive. Furthermore, the tool also provides carbon intensity analysis for four other climate relevant sectors: steel, cement, shipping, and aviation.

The scenarios of the International Energy Agency (IEA) form the basis of the analysis. Physical / industry 'asset level data' (current and forward looking) is mapped to companies, parents, and securities. This allows the link to be established between financial portfolios and industry and production data of sectors. Consequently, this allows a comparison to the 2°C scenario (an economic transition consistent with limiting global warming to 2°C above pre-industrial levels) and a corresponding evaluation of the alignment of the portfolio.

Outputs of the analysis

This tool enabled us to assess exposure to transition risk on our proprietary corporate bond and listed equity portfolio. The results indicated that 18.4% of the total corporate bond and equity investments are in the seven climate relevant sectors covered by the tool.

According to the PACTA tool, these sectors typically account for a large part of the carbon footprint of institutional investor portfolios. With limited access to the underlying calculations in the tool, we cross referenced these outcomes (on a best effort basis) with our carbon footprint analysis, which confirmed this to be the case. These sectors together explained 68% of our portfolio's Corporate Fixed Income carbon footprint.

How PACTA measures climate alignment for the sectors and asset classes

2°C IEA Scenarios
- By Technology
- By Location

Financial Portfolios

Stock Tickers

Listed Parent Companies

Owners

Data on physical assets

% Misalignment from 2°C

Asset level data:
- 97,000 power plants
- 22,000 Oil- and Gas fields
- 95 million produced cars
- 2,400 coal mines

Source: www.transitionmonitor.com

The tool separately analysed the results of the corporate bond and equity portfolio. The equity portfolio showed a relatively low coverage of climate relevant sectors in comparison with the corporate bond portfolio. Also considering the relatively small portfolio size and limited number of names within the equity portfolio, the results for equities were less meaningful to us. We therefore focused on the largest of the climate relevant sectors within the corporate bond portfolio, which is the power generation sector.

Current exposure to activities in high carbon sectors

In the chart below, the exposure of NN's corporate bond portfolio to technologies in the power generation sector is compared with the global corporate bond market[4]. Because NN's exposure is higher than the market, it suggests that our corporate bond portfolio is currently more exposed to transition risk for this sector than the market, all other things being equal. The chart also shows the weight of each technology. For instance, our portfolio is currently more exposed to power capacity from gas, but the exposure to hydro and renewables is also higher compared with the market.

Current exposure of NN's corporate bond portfolio to technologies in the power generation sector
(as a % of the portfolio compared with the corporate bond market)
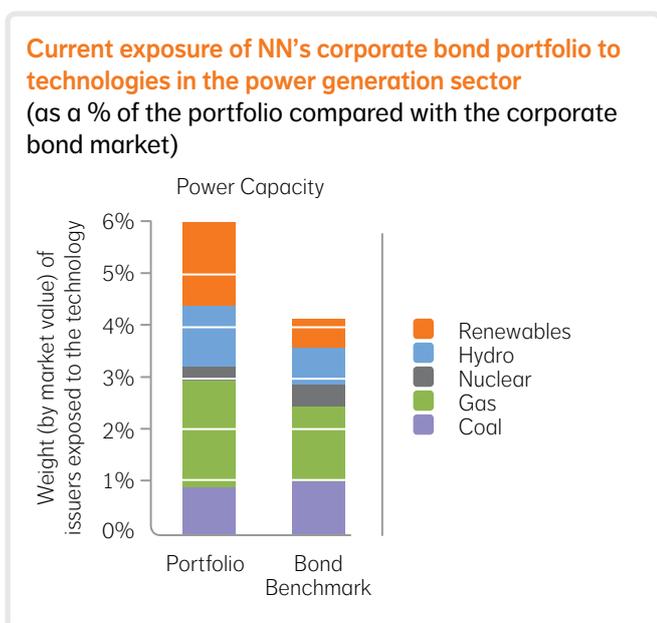
Alignment with transition scenarios over the next five years

The extent to which transition risks will materialise is likely to be at least in part a function of the evolution of the portfolio companies' activities over time. Based on the current revealed investment and production plans of power companies in the portfolio, the PACTA tool provides an analysis of the alignment of technologies for the portfolio relative to various IEA transition scenarios, and the market. If policy, technology, market or regulatory changes occur to bring the global real economy in line with a 2°C or lower scenario, misalignment in a given technology would likely change the financial returns associated with the underlying assets. The charts on the next page show that over the next five years, NN's corporate bond portfolio will increase alignment with the SDS transition scenario (also referred to as the '2°C scenario'), and compares favourably with the global corporate bond market, on average.

The tool also provides insights into the expected relative exposure of the portfolio across power generation technologies in five years' time. This analysis indicates that as a result of the expected evolution of the portfolio companies' activities our corporate bond portfolio will be close to the expected technology mix under the 2°C scenario in 2023. Note that with no access to the background calculations, we were not able to validate these outcomes. Furthermore, it is important to highlight that the analysis does not include assumptions around changes in portfolio composition. Rather, it is limited to how the portfolio's exposure to high-carbon and low-carbon technologies is expected to change over time as a function of changes in company exposures, independent of portfolio composition changes.
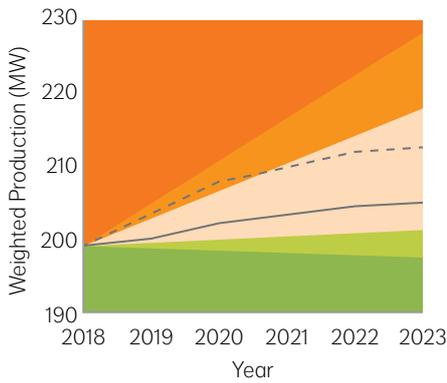
Conclusions

The PACTA tool seeks to provide insights into portfolio exposure to transition risk over multiple scenarios. There are several inherent limitations with the scenario analysis. For instance, the model outcomes provide a 'point in time' assessment; it does not include assumptions around changes in portfolio composition, nor does it take into account how the investment and production plans of companies may change over time. That is also not what scenario analysis does; it does not try to forecast the future. It is about exploring the challenges and risks that we would likely face if alternate future landscapes were to emerge. As such, we found it useful to inform future scenario analysis and actions to better position the portfolio to a 2°C or lower scenario. Besides supporting our policy development, tools such as PACTA help to prioritise future deep-dives into our exposure to sectors sensitive to climate risk.
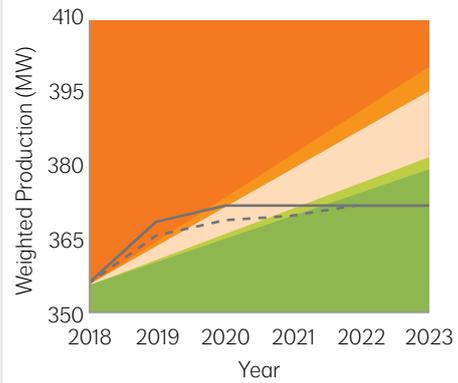
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4 The market portfolio results are calculated based on the exposure of the global universe of assets in the corporate bond market to these sectors

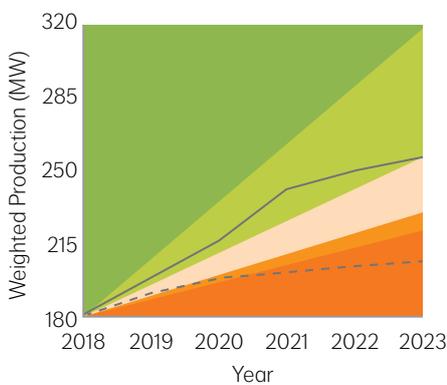## Five year trend – NN portfolio corporate bonds – Power generation sector
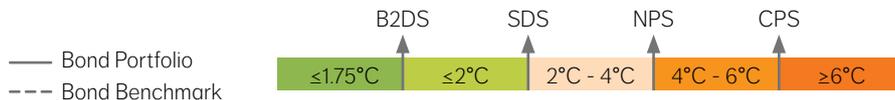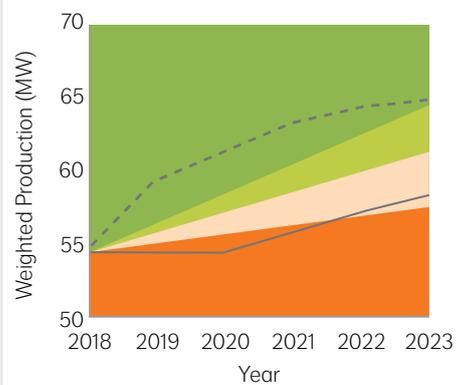
Trajectory of Coal Power Capacity

Weighted Production (MW) — Year (2018–2023), scale 190–230

Trajectory of Gas Power Capacity

Weighted Production (MW) — Year (2018–2023), scale 350–410

Trajectory of Renewable Power Capacity

Weighted Production (MW) — Year (2018–2023), scale 180–320

Trajectory of Nuclear Power Capacity

Weighted Production (MW) — Year (2018–2023), scale 50–70

Legend:
— Bond Portfolio
--- Bond Benchmark

B2DS | SDS | NPS | CPS

| ≤1.75°C | ≤2°C | 2°C - 4°C | 4°C - 6°C | ≥6°C |

How to read the chart

The solid line in the graphs shows the planned evolution or trajectory of installed capacity in the specific technology for NN's corporate bond portfolio over the next five years. The dotted line represents the planned evolution of the global corporate bond market, scaled to the same starting point as our portfolio. The colour-coded background areas plot the portfolio's 'target production' for each technology under the IEA transition scenarios: B2DS, SDS, NPS, CPS. These scenarios relate to limiting the global temperatures. For example, the green coded-areas show the Sustainable Development Scenario (also referred to as '2° scenario') or Below 2 degrees scenario.

Amount of gas-fired power capacity allocated to the portfolio each year.

This is the portfolio's 'planned production profile'.

Trajectory of Gas Power Capacity

Weighted Production (MW) — Year (2018–2023), scale 350–410
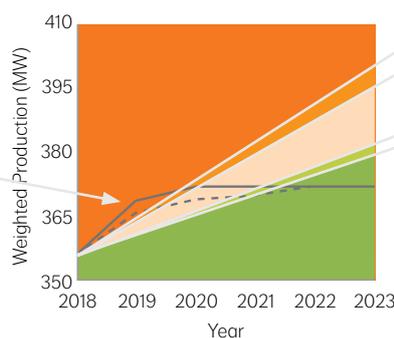
Portfolio's 'alternative production profile' consistent with:

CPS
NPS
SDS
B2DS

--- scenarios