Climate Solutions Investments and Impact Measurement Framework

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Contents

Clarification note
This document outlines NN Group's definition of climate solution investments and its
methodology for measuring the estimated emissions avoided by these investments.
It details the data sources, methods, and assumptions used in this calculation.
Version: March 2024

Important legal information

Introduction

NN Group is committed to the goal of net-zero GHG emissions by 2050 for our proprietary investment portfolio. In order to align our investment portfolio to the goals of the Paris Agreement we joined the Institutional Investor Group for Climate Change (IIGCC) Paris-Aligned Investment Initiative (PAII) through which we contributed to the Net-Zero Investment Framework (NZIF). NZIF provides a common set of recommended actions, metrics and methodologies through which investors can maximise their contribution to achieving global net zero emissions by 2050[1] or sooner. Investing in climate solutions is a key component of the framework. NN believes climate solutions contribute in the transition to a carbon neutral economy.

NN Group has developed an internal framework to define 'climate solutions investments' as part of its proprietary investments portfolio. We followed the guidance from the NZIF, Net-Zero Asset Owner Alliance (NZAOA) and sought alignment with the EU Taxonomy where possible. Taking a precautionary approach, we have defined climate solutions as investments in economic activities that contribute to climate change mitigation or adaptation.

To better understand the positive impact that investees (companies, project and assets) we invest in through our investments in climate solutions have on the environment, we have developed an impact measurement framework based on a combination of available international standards. As an indicator of the positive impact of our investees, we report the estimated emissions that investees in our climate solutions portfolio have avoided. It is important to note that we do not use this calculation as an offset in our carbon footprint calculation for our investments. Additionally, our calculation does not account for any negative impact that our climate solution investments may have on society and the environment. We plan to analyse the negative environmental and social impacts of our investments in climate solutions more thoroughly in the coming years. The calculated emissions avoided and other metrics should always be referred to as estimated, and never as actual.

With this impact measurement framework, NN Group measures the impact of its investments in climate solutions on the environment for the first time. We report on it in our Annual Report 2023. While international standards are still being developed and market participants are looking how to commonly apply the methods to estimate their positive impact, we relied on the existing industry guidance and principles behind it. By publishing this framework we provide details into our approach and aim to add to the industry practice. It should be noted that this impact measurement sets a baseline and we look to further refine the framework according to the development of industry standards, market and feedback.

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1 IIGCC, 2023, Paris Aligned Asset Owners (iigcc.org)

Definition climate solutions

In defining climate solutions per asset class, we supported our definitions with external certifications, asset labels, and environmental standards where possible and relevant. Our definitions are as follows including our specification of valuations:

- **Renewable energy infrastructure:** Investments in projects (equity/debt) for renewable energy infrastructure, such as in solar PV, offshore and onshore wind, hydrogen, storage and energy efficiency. Valuation for infrastructure equity is on market value and for infrastructure debt on outstanding loan balances.
- **Certified green buildings:** within our real estate portfolio (equity/debt), our definition is limited to assets with at least an Energy Performance Certificate (EPC) of class A, or if EPC is not available a high level of building certification (BREAAM or HQE certification of at least 'Excellent', or LEED or DGNB of at least 'Gold'). Valuation for Certified green buildings is for equity investments on market value and for debt investments on outstanding loan balances.
- **Green bonds:** the green bonds we invest in are in line with the NN Green, Social and Sustainability Bond Standard which is aligned with the ICMA's Green Bond Principles and needs to be applied in addition to the basic Responsible Investment (RI) criteria as described in the NN RI Framework Policy and related standards. Valuation of the green bonds is on nominal values.
- **Other:** Investments that do not fall into any of the categories above, including investments in unlisted entities. For example, impact private equity funds that target and report on clearly defined climate impact KPIs, or funds that have a broader ESG focus, but where clean and renewable energy projects account for a substantial part of the fund. Valuation is on market value.

Impact measurement methodology

Definition

As mentioned, the indicator of positive impact we use for our climate solutions is estimated emissions avoided. This indicator aims to disclose the amount of emissions that would have been emitted if investments had been allocated according to a benchmark. The benchmark is defined differently per climate solutions investment type. Therefore, emissions avoided is calculated differently for different climate solutions investment types.

We report the indicator together with the
· % of climate solutions included in calculation as a proportion of climate solutions investments (€) for which impact could have been calculated, and
· PCAF Data Quality as defined in the PCAF Financed Emissions Standard for different asset classes

The methodology to calculate emissions avoided draws on several market standards and guidance, such as PCAF Financed Emissions Standard, ICMA Harmonised Framework for Impact Reporting and Nordic Public Sector Issuers Position Paper on Green Bonds Impact Reporting. None of these standards and guidance in itself provides enough information on avoided emissions across asset classes in order to align our methodology to any of them fully. While we were guided by the principles of these standards and guidance, we are using this framework to clarify the decisions we made in calculating the impact.[2]

Scope

Emissions avoided have been estimated for the companies, projects and assets (investees) NN Group invests in through our climate solutions investments at the end of 2022. Due to data availability, the percentage of investments for which we report impact figures varies per climate solutions investment category. An overview of the climate solutions portfolio at the end of 2022 is provided in Figure 1. We calculated emissions avoided over 2022.

Investments in climate solutions (in EUR million)

	2023	2022	2021
Renewable energy investments	1,255	792	567
– of which: Infrastructure equity	354	250	44
– of which: Infrastructure debt	901	542	523
Certified green buildings*	5,323	5,198	3,817
– of which: Equity investments	4,722	4,454	3,236
– of which: Debt investments	601	744	581
Green bonds	4,091	2,113	637
Other	83	64	41
Total	**10,752**	**8,167**	**5,062**

* Buildings within NN's non-listed real estate portfolio; the residential mortgage portfolio of NN Group not covered in this category.

Figure 1 Climate solutions portfolio (Dec 2022). Source: NN Group N.V. Annual Report 2023

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2 We are also aware of the methodology proposed by the GHG Protocol and World Resources Institute. However, the data granularity needs to improve in order to implement this methodology at the financial institution level.

Data gathering process and data quality

The data gathering process and methodology is defined by investment types included in climate solutions and depends on how a specific climate solution investment is managed. The data is requested from asset managers that manage climate solutions. Data gathering process and calculation methodology differs per climate solution investment type and is further described below per investment type. In general, each manager is asked to provide an audit report that describes their data management processes related to the data reported to us. In case such reports are not available, the manager is requested to provide supporting evidence for a couple of underlying investments.

The data to calculate emissions avoided, such as energy production, capacity or consumption data, often does not go through as rigorous of an assurance process as financial data. While it can still provide insights, it is difficult to integrate such data in investment decision-making. We aim to enhance the rigour of our approach and encourage our asset managers to do the same with respect to non-financial data.

To assist in gauging the quality of the underlying data, for each asset class, PCAF Data quality score is assigned based on PCAF guidance.

The data collection and calculation process is subject to limited assurance.

Renewable energy investments

In renewable energy investments, following the PCAF guidance, we define estimated emissions avoided as emissions that would have happened if investments had been directed in the same attribution to the electricity generated by the least economically efficient energy generation facility.

Firstly, we collect installed capacity and per country annual electricity production of assets in operation via external asset managers managing the portfolio of climate solutions on our behalf. If actual electricity production figures are not available, we use P90 10-year estimated electricity production figures. In case where the estimated electricity production was not provided by the project parties, production is calculated by multiplying (1) the annual load hours of wind, solar or hydro by (2) the project capacity (kW). While PCAF recommends using P50 value, we decided to use a P90 value to exercise caution. P90 10-year value should be interpreted as a predicted value of electricity production that has a 90% probability of being exceeded in an average year over a 10-year period.[3] Such data comes from project's financial model, Lender Technical Advisor (LTA) report or annual operational reports.

In order to estimate annual renewable energy produced at the portfolio level we use the following formula:

$$\text{Renewable energy produced}_p = \sum_a \text{Attribution factor}_a \times \text{renewable energy produced}_a$$

Where p stands for portfolio and a for asset.

By multiplying renewable energy produced per asset with a country-specific emission factor for each country where a project has assets in operation, we obtain estimated emissions avoided per asset. It is assumed that our investment into the project or investee is attributed equally to each country where the project or investee has eligible assets. PCAF recommends to use the operating margin (OM) measured in gCO2eq/kWh as the emission factor. By using the OM, it is assumed that the electricity generated by the renewable energy project of any technology will replace the electricity generated by the least economically efficient energy generation facility. The OM is used in the methodology because the assessment is backward-looking by measuring avoided emissions over the previous financial year (FY2022). For any forward-looking measurements, we would need to look at the combined margin (CM) which takes the future energy into account together with the current mix. The country-level OM data is retrieved from the UNFCCC International Financial Institution (IFI).

We do not account for all production and emissions avoided of our investees. Rather we attribute them to our share of investment. One step further, our asset managers also attribute production and emissions avoided only to the share of their investees investment in a specific project. We calculate the attribution factor as follows:

$$\text{Attribution factor}_a = \frac{\text{Outstanding amount}_a}{\text{Total equity+debt}_a}$$

$$\text{Outstanding debt amount}_a = \text{debt} - \text{repayments}$$

$$\text{Outstanding investment amount}_a = \% \text{ ownership share} \times \text{equity value}$$

where outstanding debt amount represents the current face value of debt provided by NN and equity value represent the market value of equity owned by NN.
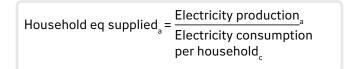
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3 PCAF, 2022, The Global GHG Accounting and Reporting Standard for the Financial Industry (carbonaccountingfinancials.com)

Estimated avoided emissions are then calculated as:

$$\text{Avoided emissions}_p = \sum_a \text{Attribution factor}_a \times \text{Electricity production}_a \times \text{operating margin}_c$$

where c stands for country of the electricity producing asset.

In order to put the renewable energy produced in context, we estimate number of home equivalents that can be supplied by the estimated renewable energy generated of our portfolio. We use the following formula to do so:

$$\text{Household eq supplied}_a = \frac{\text{Electricity production}_a}{\text{Electricity consumption per household}_c}$$

where the average electricity consumption per dwelling comes from Odysee-Muree Project. The data from the project refers to average electricity consumption per dwelling from 2019 across European countries. Therefore, the scope for the estimated number of home equivalents supplied number is assets based in Europe. Dwelling and household are used interchangeably here.

For investments in renewable energy, we receive production and generation data from external asset managers. At the same time, we know the outstanding amount of our investment in the project or investee and the total equity plus debt of the project or investee. Accordingly, the PCAF data quality score for renewable energy investments is Score 3.[4]

However, PCAF data quality score does not capture the fact that for our equity investments, we primarily rely on actual production and generation data, while, for our debt investments, we rely on projections.

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4 As defined in PCAF, 2022, p83, The Global GHG Accounting and Reporting Standard for the Financial Industry (carbonaccountingfinancials.com)

Green buildings

In investments in green buildings we define estimated emissions avoided as the difference between estimated emissions from investments in climate solutions and estimated emissions from equally sized properties with the average emission intensity from the same country and sector. This relies on the definition provided in the Position Paper on Green Bonds Impact Reporting by Nordic Public Sector Issuers.[5]

For equity investments in green buildings, we calculate emission and energy intensity data for only those assets that have emissions and energy consumption data available for the whole floor area of the building across the entire year. In case such data is not available, Global Real Estate Sustainability Benchmark (GRESB) would not provide emission and energy intensity data and we would not report emissions avoided and energy saved for those assets. GRESB also only provides data for standing assets meaning that assets in development are excluded from our analysis. Further, as we invest in many green buildings through funds, we estimated emissions avoided only for those assets for which we had enough asset-level financial and sustainability data. Funds that report to GRESB for the first time are also not required to publish the data through GRESB portal. Adjusting for the above reduced the portfolio for which we could estimate emissions avoided to approx. 51% of climate solutions investments in green buildings as of December 2022. We remain engaged with asset managers to increase the data coverage.

The following formula is used:

$$\text{Energy consumption intensity}_a = \frac{\text{Energy consumption}_a}{\text{Area}_a}$$

$$\text{Emission intensity}_a = \frac{\text{GHG emissions}_a}{\text{Area}_a}$$

where a stands for asset. Area is gross floor area (GFA) as used by GRESB.

We compare emission and energy intensity per asset with the average CO2 emission factor and energy intensity of buildings in the corresponding sector and country to obtain energy saved per m2 and emissions avoided per m2. The source of this data is PCAF European building emission factor database created by Guidehouse Netherlands B.V. on behalf of PCAF. We use emission factors specific to the sector and country of the asset as these are usually two primary variables when making investment decisions.

$$\text{Energy saved per m}^2 = \text{Energy intensity}_a - \text{energy intensity}_{(c, s)}$$

$$\text{Emissions avoided per m}^2 = \text{emission intensity}_a - \text{emission factor}_{(c, s)}$$

where c stands for country and s for sector.

To calculate emissions avoided and energy saved by the portfolio, the following formula was used:

$$\text{Energy saved}_p = \sum \text{Attribution factor}_a \times \text{Area}_a \times \text{energy saved per m}^2_a$$

$$\text{Emissions avoided}_p = \sum \text{Attribution factor}_a \times \text{Area}_a \times \text{emissions avoided per m}^2_a$$

where attribution factor is calculated as:

$$\frac{\text{NN Gross Asset Value}_a}{\text{Asset level property value}_a}$$

where NN Gross Asset Value is the gross asset value (GAV) attributable to NN based on reporting date of latest asset level GAV data (if available) or latest financial reporting date and Asset level property value is asset current market value. Due to data availability, we use GAV instead of net asset value (NAV). Since property value at loan or equity origination is not feasible to obtain, we follow PCAF guidance and use the latest property value available.

By calculating energy saved and emissions avoided in this way, we assume that should the investment in a particular asset not have been made, it would have been made in an asset from the same country and the same sector.

5 Nordic Public Sector Issuers, 2020, NPSI_Position_paper_2020_final.pdf (kuntarahoitus.fi)

For debt investments in green buildings, the process is different due to GRESB data for debt investments not being available. As opposed to having actual consumption and emission figures, we estimate these figures by using emission and energy factors specific to country, sector and EPC labels. Therefore, the scope for calculating emissions avoided and energy saved includes only properties with an EPC label, which amounts to 68.76% of climate solutions debt investments in green buildings.

This means that the energy saved and emissions avoided for real estate debt investments were calculated according to the following formulas:

$$\text{Energy saved}_p = \sum \text{Attribution factor}_a \times \text{Area}_a \times (\text{energy intensity}_{c,s,EPC} - \text{energy intensity}_{c,s})$$

$$\text{Emissions avoided}_p = \sum \text{Attribution factor}_a \times \text{Area}_a \times (\text{emission factor}^{c,s,EPC} - \text{emission factor}_{c,s})$$

where EPC stands for EPC label.

Attribution factor is calculated as follows:

$$\frac{\text{Outstanding debt amount}_a}{\text{Market value}_a}$$

Relying on PCAF guidance, we used 2020 emission factors.[6] These emission factors are taken directly from the PCAF European building emission factor database. For energy intensity, we used factors from 2023. If emission factor for a specific country, sector or EPC label was not available, we excluded properties related to these countries, sectors or EPC labels. Due to emission factors not being available, we excluded 2.13% of climate solutions debt investments in green buildings from the analysis.

In both, equity and debt methodologies, country- and sector-specific energy intensities and emission factors used as benchmarks are derived directly from the CRREM Global Pathways. In the methodology for debt investments, energy intensities and emission factors dependent on energy labels are derived from national EPC rating bands.[7]

For both asset classes, we needed to make further adjustment to the data because PCAF database provides more granular data on building types than available for our portfolio. Table below matches building types from our portfolio to building types taken from PCAF.

6 PCAF, 2023, Home page (carbonaccountingfinancials.com)

7 Decarbonisation Pathways – CRREM Global

NN building type	PCAF building type	NN-adjusted PCAF building type
Cinema		Non-residential total
Hotel / Hospitality	Hotel	Hotel
Land		Non-residential total
Leisure	Leisure/Lodging	Leisure/Lodging
Logistics	Distribution warehouse cold	Non-residential total
Logistics	Distribution warehouse warm	Non-residential total
Office	Office	Office
Other		Non-residential total
Parking		Non-residential total
Post asset		Non-residential total
Residential	Single-family house (SFH)	Residential total
Residential	Multi-family house (MFH)	Residential total
Senior living	Single-family house (SFH)	Residential total
Senior living	Multi-family house (MFH)	Residential total
Retail	Retail – high street	Non-residential total
Retail	Retail – shopping center	Non-residential total
Retail	Retail – warehouse	Non-residential total
Care home	Healthcare	Healthcare

Table 1 Matching between NN property types and PCAF building types

Since calculation differs between equity and debt investments, PCAF data quality score is also different. For both asset classes, the benchmark is based on building type and location. If we apply the PCAF Data Quality Score based on the benchmark, both asset classes would receive a Score 4. However, if we apply the score to the underlying data we have on properties, the scores differ per asset class. For equity investments, we receive primary data from GRESB. GRESB provides asset-level energy and emission data as reported to it by asset managers. Since various asset managers use different emission factors, we take a precautionary approach and apply score 2 to avoided emission data from equity investments. On the other hand, for debt investments, we calculated avoided emissions from properties with an EPC label. This corresponds to Score 3 as defined by PCAF.[8]

8 PCAF, 2022, p92, The Global GHG Accounting and Reporting Standard for the Financial Industry (carbonaccountingfinancials.com)

Green bonds

Investments in green bonds are managed by an external asset manager. The manager calculates emissions avoided and installed capacity according to the methodology published in its impact report (Goldman Sachs Green and Social Bond Funds Impact Report 2022 (p25-27)).

Since the green bond portfolio is exposed to a great number of issuers, emissions avoided are defined as annual tCO2 avoided and reported by bond issuers. The benchmark is dependent on issuer methodology.

Impact figures are reported for bonds held at the end of year. Impact figures refer to the whole year. The asset manager collects impact data from issuer impact reports and engages with the issuer if the reporting does not follow best practice, there is key information missing or any further clarification is needed. Data collection is described in more detail in the Goldman Sachs Green and Social Bond Funds Impact Report 2022 (p25-26). Issuer impact reports are usually not audited. The asset manager therefore performs a sense-check on the data. If the impact report has not been published yet, the bond falls out of scope for impact calculation. The bond also falls out of scope for calculation if impact data is of low quality. Finally, emissions avoided might not be a relevant Key Performance Indicator (KPI) for all issuers. Taking all these into account, we could estimate emissions avoided for 46.94% of climate solutions investments in green bonds as of December 2022.

Issuers usually publish impact reports when they allocate all proceeds or one year after the issuance of the bond. In case the issuer allocated proceeds, published an impact report after full allocation, but did not publish additional impact reports, the last reported impact is assumed to continue. Such expected impact, as well as if the issuer only reports expected impact, is taken into calculation only if the methodology for calculating it is reasonable. Cumulative reported impact is deduced into the annual impact.

We do not apply the PCAF Data Quality Score to this asset class because the PCAF Standard does not provide data quality score for green bonds. Since the methodology to calculate the impact of our green bond investments is heavily reliant on the issuer methodologies, this further makes the application of data quality score more difficult.

Other

Climate solutions investment type labelled Other include investments in unlisted entities. This primarily involves investments in private equity funds.

Private equity funds often invest across multiple industries and sectors. When they search for positive impact, they often define different theories of change for different investments. This can lead to different KPIs set for different investments. Therefore, emissions avoided might not be the best suitable KPI for each investment.

We report emissions avoided only for those underlying companies for which the funds we invest in report emissions avoided. This amounts to 48.69% of climate solutions investments in category Other. Similar to the approach to impact reporting we applied for green bond investments, in reporting emissions avoided for the category Other, we also take figures as reported by the fund managers and their investees. This means that the methodology to calculate emissions avoided can differ from one fund and/or investee to another. In order to better understand the data we receive, we prefer to work with managers who are transparent about the calculation of their impact figures.

The impact is attributed to our share of investment.

$$\text{Attribution factor}_a = \frac{\text{Outstanding amount}_a}{\text{Total equity+debt}_a}$$

$$\text{Outstanding investment amount}_a = \%\ \text{ownership share} \times \text{equity value}$$

Equity value represents the market value of equity owned by NN. These values are double-checked with the regular manager financial reporting.

We do not apply the PCAF Data Quality Score to this asset class for the same reasons we do not apply it for our green bond investments.