

Climate-Related Risks and Opportunities

Reporting in accordance with the Task Force on Climate-related Financial Disclosures

Introduction

2018 was another very hot year. The summer in the Netherlands was the hottest in three centuries. Worldwide, 2018 is ranked as the fourth hottest year on record since the industrial revolution, the reference point in the Paris Climate Agreement. This represents the continuation of a trend: 18 of the 19 hottest years on record were in the 21st century. Since the industrial revolution, the average temperature has already risen by approximately 1°C.

The extreme weather of the past few years and the associated damage caused by wind, droughts, floods and forest fires clearly indicate that climate change is no longer a long-term risk. The risks are manifesting themselves in this day and age and are expected to increase if mitigating measures are not forthcoming or are insufficient.

The awareness of these risks is rapidly increasing. The 2018 Climate Agreement outlines an ambitious transition plan for the Netherlands. The transition – within the Netherlands and beyond – brings new risks with it, but also creates great opportunities. This annex describes how we manage these risks and exploit the opportunities. We use the framework of the Task Force on Climate-related Financial Disclosures (TCFD), of which we also are a member, for this purpose.

Climate change has been one of the spearheads of PGGM and our clients for many years. Our aim is to be a frontrunner in the management of climate-related risks. At the same time, we are working closely together on this subject with other institutional investors domestically and abroad. In 2018 we joined the Investor Leadership Network, a direct outcome of Canada's 2018 presidency of the G7 and which was launched with the support of the Canadian government. Through this network we aim to boost the quality of TCFD reporting by investors and by the companies in which we invest.

Governance

The Management Board of PGGM Vermogensbeheer BV (PVBV) oversees all material financial risks and the management of these risks in our clients' portfolios. This includes climate-related risks that could exert a

significant influence on parts of the portfolio.

The Risk & Compliance department is responsible for coordinating the risk management process and draws up a risk report each month. This risk report presents the risk profile for each cluster of risks and compares it to the risk appetite adopted by PVBV's Management Board. The content of the risk report is discussed and confirmed in the Unit Risk Committee. A consolidated risk report containing the total risk profile for PGGM as a whole is discussed on a quarterly basis in the PGGM Corporate Risk & Compliance Committee.

Any adjustments to the portfolio are discussed in the Economic & Financial Markets Committee on the basis of an environmental analysis that also includes climate change if current developments give rise to this.

Investment proposals involving amounts of €100 million or higher or of a special nature are presented to the Investment Committee, whose members include the Chief Investment Management, the Chief Risk & Compliance Officer and the Chief Investment Officers. The individual investment teams are responsible for managing risks, including climate-related risks, that are part of their strategies in public and private markets and that are involved in entering and managing individual transactions.

PGGM has a client-facing risk function. This function provides clients direct, without first-line intervention, access to PGGM's risk management.

PGGM has an [Advisory Board Responsible Investment](#) (ABRI) that provides advice concerning the development and implementation of activities relating to responsible investment. The ABRI consists of five independent experts with expertise in PGGM's areas of focus, including climate change, and are appointed by our clients and PGGM.

Strategy

As a pension fund service provider, PGGM carries out the investment mandates of our institutional clients. The optimal assessment of risks and expected returns are key in this respect. In terms of climate, we make a distinction between physical and transition risks. Physical risks arise as a *consequence* of climate change. Transition risks arise due to society's attempts to eliminate the *causes* of climate change – the emission of greenhouse gases.

Physical and transition risks are negatively correlated. In a

favourable climate scenario (2°C or better), the transitions risks have the upper hand; in an unfavourable scenario (more than 2°C), the physical risks dominate. This means that at least one of both risks will materialise and because of this it is difficult to entirely eliminate climate-related risks. Of course, that is not our task: without risk there is no return. What is important is whether our clients are rewarded for the risks they incur.

Together with our clients, we are convinced that climate change – and in particular the need to counteract climate change – not only entails major risks, but also opportunities. We are trying to exploit these opportunities, while at the same time contributing to solving the climate problem. For example, one of our largest clients has mandated us to quadruple their investments in solutions, including solutions for climate change, to €20 billion by 2020, up from €5 billion at year-end 2015. At year-end 2018, we had invested €7.7 billion in solutions for climate change.

We identified the risks and opportunities inherent in climate change and the energy transition for various components of the portfolio on the basis of scenarios (Figure 1). The scenarios vary along the policy and technology axes, which represent the key uncertainties over the time horizon used (15 years). These factors may reinforce each other or may move in opposite directions. In the most favourable scenario (Green Growth), effective and coordinated government policy (particularly the pricing of CO₂ and other greenhouse gases) and rapid technological breakthroughs (for example relating to battery technologies) create a positive spiral, which limits the earth's warming to a maximum of 2°C by the end of this century, in line with the goals of the Paris Climate Agreement. In an unfavourable scenario (Divided Polluters), policy is fragmented internationally or regionally and new technological breakthroughs fail to materialise, as a result of which the earth's warming may have risen by up to 4°C or even more by the end of the century. The scenarios Restrained Policy and Government Action fall in between these scenarios; policy and technology act in opposing directions here. All of these outcomes are still feasible; as investor we must provide due consideration to multiple outcomes. Table 1 summarises the effects of these scenarios on portfolio components.

The analysis produced a number of interesting insights. A 2°C scenario has winners as well as losers, but a 4°C scenario really only has losers. Over the short term, the impact of a 2°C scenario is stronger than the impact of 4°C-scenario, however. The explanation for this is that the transition risks in a 2°C scenario will materialise sooner than the physical risks in a 4°C scenario. Furthermore, the coastal areas in poorer countries with insufficient resources to protect themselves against rising sea levels are particularly vulnerable to the effects of climate change. PGGM invests relatively little in these areas. The conclusion that a rapid transition to a 2°C scenario entails significant risks is also

confirmed by a recent [study](#) conducted by the Nederlandsche Bank.

Figure 1 Climate Scenario's

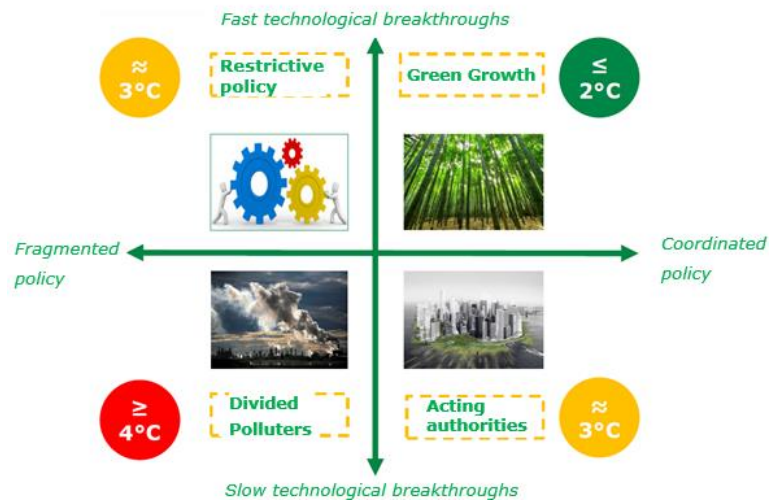


Table 1 Expected impact of climate change on the value of portfolio components

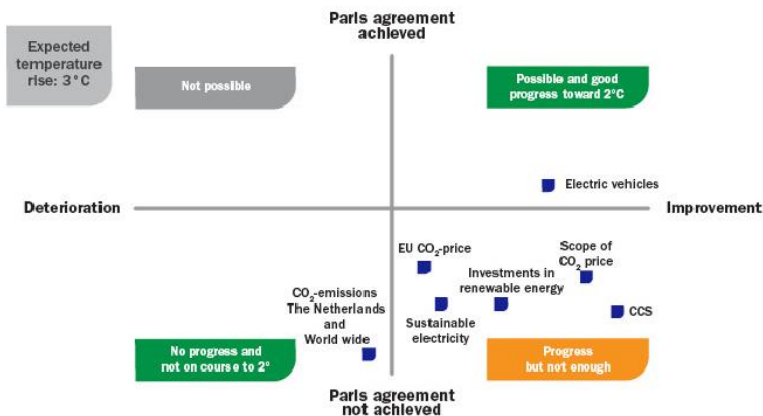
	2°C	3°C	4°C
Oil	Red	Red	Red
Gas	Green	Green	Red
Coal	Red	Red	Red
Renewable energy	Green	Green	Red
Nuclear energy	Green	Green	Red
Utilities (electricity)	Red	Red	Red
Materials	Red	Red	Red
Mining	Red	Red	Green
Heavy industry	Red	Red	Red
Transport	Green	Green	Red
(Sustainable) real estate	Red	Red	Red
Sustainable consumer goods	Red	Red	Red
Non-sustainable consumer goods	Red	Red	Red
Healthcare	Green	Green	Green
Financial institutions	Green	Green	Red
IT	Green	Green	Green
Telecom	Green	Green	Green

Note: the colours reflect the direction of a scenario's impact on the value of the portfolio component. Green represents an expected increase in value, red represents a decrease in value. The deeper the colour, the greater the expected impact. The table does not provide any insight into the weights of the various components of the portfolio. It is therefore impossible to draw any conclusions from the table about the overall impact.

Translating this analysis into an investment strategy is difficult due to a combination of factors. First is the large spread in the number of plausible climate scenarios. While there was agreement in Paris on limiting the earth's warming to a maximum of 2°C, specific policy measures have since largely failed to materialise, leaving aside a few exceptions, such as the reform of the European Emissions Trading System (ETS). Second, the winners in a 2°C scenario generally appear to be the losers in a 4°C

scenario and vice versa. An investor who positions himself in relation to a specific climate scenario consequently runs significant financial risks. Last year we developed a climate monitor that provides insight into the direction of climate change and the pace of the energy transition, and consequently the probability distribution of the various climate scenarios (Figure 2).

Figure 2 Climate Monitor



In the Netherlands and beyond, there is an increasingly more vocal call by climate scientists and economists for effective pricing of CO₂ and other greenhouse gases.¹ PGGM has been [arguing](#) for this for some time as well. Proper CO₂ pricing is not only an effective and justified instrument to counteract climate change, but it would also help us significantly increase the share of sustainable investments in the portfolio, because sustainable companies and technologies are better able to compete with non-sustainable alternatives. In 2018 we signed an [appeal](#), issued by various organisations, such as the Institutional Investor Group on Climate Change (IIGCC), calling on governments to act on the agreements of the Paris Climate Agreement. The appeal was published in June and presented to government leaders during the COP 24 later that year.

Although the pace of the energy transition is as yet uncertain, the direction is clear. We are convinced that a higher CO₂ tax is unavoidable over time. For this reason, we started to lower the footprint of the equity portfolio several years ago. We do this by reallocating investments in the most CO₂-intensive sectors – energy, utilities and materials – to relatively CO₂-efficient companies. In our view, companies with high emissions are insufficiently prepared for a low CO₂ future and are therefore gradually disappearing from the portfolio. In this respect we are keeping the sector allocation unchanged, because we believe that all sectors will continue to play a significant role in a low CO₂ economy (see page 6 for additional information). Within real estate we focus on energy-efficient buildings and increasing the sustainability of existing real estate.

Experience during the hurricane season in recent years, for example, shows that we need to increasingly provide consideration to the physical risks inherent in climate change. The latest IPCC report issues the same warning: even in a 2°C scenario the effects are significantly greater than in a 1½°C scenario. As investor in insurance products, we have many years of experience modelling the damage resulting from natural disasters. We are now applying this experience to other components of the portfolio. For example, last year we geographically mapped out the entire real estate portfolio and simulated the consequences of rising sea levels under various scenarios. This has provided insight into the physical risks of climate change.

Risk Management

PGGM's investments are subdivided into public and private markets. Public markets (approx. 75% of all investments) are relatively liquid and efficient. Public market investments, such as government bonds and listed equity, are therefore mainly managed within a limited active mandate focused on replicating a widely spread index. Climate-related risks are established and managed at a strategic level. Benchmarks are reviewed annually, in part on the basis of climate change-related expectations.

Private markets are less liquid and efficient. Portfolios are more actively managed and due to the extended investment horizon, the sensitivity of these investments to climate change is above average. Benchmarks are used as an [accountability tool](#), but are not leading to the same extent. The investment teams (first line) therefore have greater accountability. These teams must explicitly devote attention to climate-related risks in their portfolio. Investment proposals are explicitly tested for climate-related risks during the due diligence process. PGGM developed an ESG risk framework for this purpose in 2018. With the aid of this framework, the ESG risk score is consistently evaluated across all investment categories. The ESG score is established at three levels: country, sector and manager.

Transparency about the exposure to climate-related risks is a prerequisite for effectively managing these risks. As a member of the TCFD we promote better standards and greater transparency in dealing with climate change. The TCFD framework has made significant strides forward in a short period of time and has resulted in better reporting on climate-related risks. Since 2018, PGGM has also been represented on the Technical Expert Group on Sustainable Finance of the European Commission, which has made proposals designed to further anchor the TCFD's recommendations.

¹ E.g. see the '[Preadviezen 2018 van de Koninklijke Vereniging voor de Stathuishoudkunde](#)' and the [statement](#) of a group of American economist on carbon dividends as appeared in the Wall Street Journal.

We expect the companies in which we invest to understand how climate change and the energy transition can influence their activities, the risks they incur and the opportunities open to them, and we expect them to act on this. Where possible and sensible, we expect companies to make a positive contribution to the energy transition and to slowing down climate change.

We engage portfolio companies through the Climate Action 100+ (CA100+) partnership. In this respect we primarily focus on the energy sector, and in particular on companies with relatively high emissions, but that nevertheless still remain within the portfolio. Through CA100+, we ask companies (i) for robust governance with clear accountability for climate-related risks and opportunities; (ii) to reduce the emission of greenhouse gases across the value chain; and (iii) to report in accordance with the TCFD framework.

We vote at meetings of shareholders. There has been an increased focus on climate change in recent years. This is evident from the growing number of shareholder resolutions. In recent years 'Follow This' in particular attracted a great deal of attention with its resolution that calls on Shell to commit to the objectives of the Paris Climate Agreement with hard targets. In 2018 we refrained from voting on this proposal, because on the one hand we endorse the goal of this proposal, but on the other hand, we recognise that Shell can only achieve these objectives if the rest of society – in particular the energy demand side – makes the necessary adjustments.

Our sustainability goals sometimes force us to make difficult decisions. For example, in 2018 we voted against a proposal for the construction of a new coal-fired power plant by ENEA. However, due to its high CO₂ intensity, we had already significantly phased out our interest in ENEA as a result of which our opposing vote carried too little weight at the shareholders' meeting and the proposal was accepted. We have since completely phased out our interest in this company.

Metrics and Targets

In 2016 we started working on cutting the footprint of our equity investments by half. We calculate the footprint as the weighted average of the CO₂ intensity of the companies in the portfolio. The CO₂ intensity is calculated as the emission (Scope 1, 2 and Scope 3 upstream first tier emissions) of a company divided by turnover. This weighting is equal to the relative weighting of a company in the portfolio.

During the baseline measurement, the year-end 2014 footprint was set at 339 tonnes CO₂ equivalent per million dollars of company turnover. The goal is to cut this in half to 170 tonnes by 2020. At year-end 2018 the footprint had dropped to 239 tonnes. The footprint declined less than expected in 2018. This is due to the increased CO₂ intensity

of various companies in the portfolio, partly caused by adjustments in emission data that on balance resulted in an increase in the measured emissions. Furthermore, reducing CO₂ emissions requires major investments on the part of companies, that sometimes are only reflected in CO₂ efficiency after many years.

It is our goal to reduce the footprint of other investment categories as well. We started with the equity portfolio due to the availability of emission data, the portfolio's high liquidity, which makes it easy to make adjustments, and its high weight in terms of the overall investment mix. For other investment categories, such as fixed-income securities, the coverage of emission data is as yet insufficient, however, we hope to be able to start reducing the footprint over the coming years.

At year-end 2018, we had invested €7.7 billion in solutions for climate change.