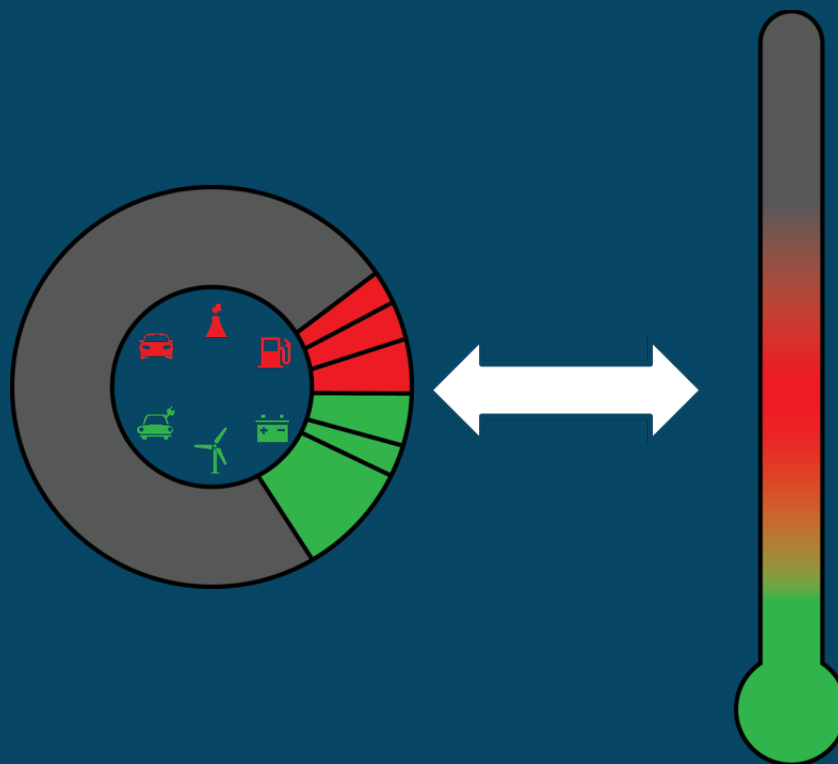


# CLIMATE ALIGNMENT PILOT TESTS SWITZERLAND 2017

## EXAMPLE REPORT FOR INVESTORS

BASED ON THE AVERAGE PORTFOLIO OF SWISS PENSION FUNDS AND  
INSURANCES

October 2017



# SECTION 1: INTRODUCTION

# INTRODUCTION

**The present document is based on an average portfolio of Swiss pension and insurance funds. It represents the reports, the participants received for their individual portfolios. Additionally, this document contains material from the background briefing provided to participants.**

The Intergovernmental Panel on Climate Change clearly demonstrated the dangers of climate change. A further rise in the temperature of the Earth's surface during the 21st century is unavoidable. In all climate scenarios it is very likely that heat waves will occur more frequently and will last longer, and extreme precipitation events will increase in intensity and frequency in many regions. The risks associated with such extreme weather events are already moderate to high with a rise of 1°C to 2°C above the pre-industrial level.

Without additional measures to reduce greenhouse gas emissions, global warming will exceed 4°C above the pre-industrial level up to 2100. This involves a number of high to very high global risks, such as considerable natural risks, threats to global and regional food security, consequent conflicts and migratory flows. The exact degree of climate change that would cause abrupt and irreversible changes remains uncertain. However, it is generally acknowledged that risks to the natural systems of the earth (water, air, biodiversity, soil fertility, etc.) as well as to the economic and social systems (production sites, value chains, etc.) may be relevant to the global capital market and the financial market in a broader sense.

In order to minimize this temperature rise and lead the global economic system along a decarbonisation path, the international community adopted the Paris Agreement in 2015, which calls countries to limit global warming to a maximum of 2°C (2°C target). This agreement explicitly refers to the alignment of financial flows with climate objectives (Article 2.1.c), that is, with a "low carbon path" (2°C), and resilient to the consequences of climate change. On this basis FOEN and SFI have initiated this voluntary pilot test with the support of the pension fund association ASIP and the insurance association SVV.

With this climate pilot test, Swiss pension funds and insurance companies were given the opportunity to obtain a voluntary, free and confidential 2°C scenario analysis of their equity and corporate bond portfolios. The project also supports Swiss pension funds and insurance companies in the voluntary implementation of the recommendations of the Task Force on Climate-related Financial Disclosure of the Financial Stability Board, published in July (FSB TCFD 2017). In the first part of this document you will find background information on the model. In the second part, a general and sector analysis of the results of the 2°C scenario analysis for your equity and corporate bond portfolios are presented. Individual reports on individual funds are available upon request and are free. The third part of this report shows options for potential actions. 2° Investing Initiative is solely responsible for its results

79 Swiss pension funds and insurance companies have participated in this pilot project. Investments totaling more than CHF 290 billion were analyzed. This corresponds to approximately two-thirds of the assets managed by Swiss pension funds and insurance companies in the investment categories examined. We want to thank you for your trust.

# BACKGROUND TO THE 2°C SCENARIO ANALYSIS & SECTORS REVIEWED

The analysis in this report is based on the 2°C scenarios of the International Energy Agency (IEA, see graphic on right). The 2°C climate goal is translated into technology and decarbonization paths for particularly climate-relevant sectors (see below). The scenarios are associated with a 50% probability of limiting global warming to 2°C above pre-industrial levels.

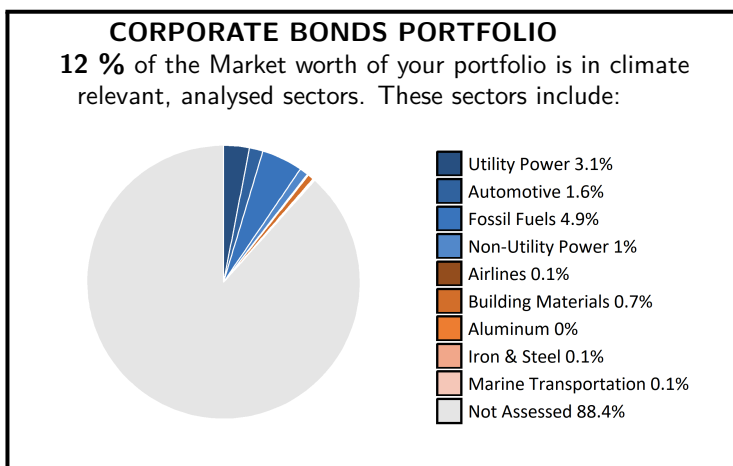
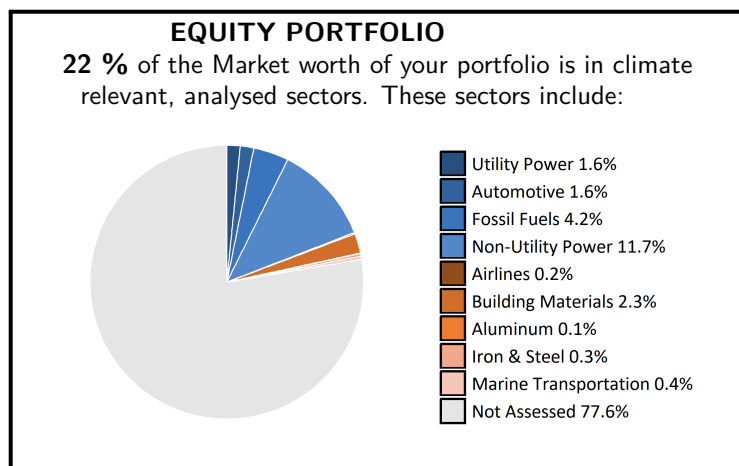
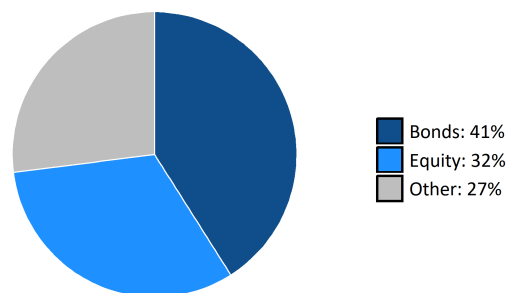
The IEA scenario is a 2°C scenario of moderate ambition. It is based on assumptions that diverge significantly from Switzerland's climate policy, regarding nuclear deployment and carbon capture and storage. However, due to its global reputation and broad sector coverage, it has been chosen as a benchmark. In the years to come, the development of alternative scenarios should provide better options for conducting the analysis.

The 2°C scenarios of the IEA focus on the energy, power generation and transportation sectors, as well as on certain industrial sectors (e.g. cement and steel). The necessary decarbonization within these sectors will be achieved in the coming decades by the increased shift from fossil to renewable energy generation, or to alternative mobility drives. In addition, efficiency increases and associated CO<sub>2</sub> reductions are projected across all sectors and new technological alternatives are expected.

The analysis is therefore divided into two parts: the first part covers the sectors in which concrete technology alternatives are available, for example, renewable energy sources. For these sectors, the production trend in the scenarios can be directly compared with the production trend in the portfolio. The second part covers the sectors in which there is currently no carbon neutral alternative, for example steel production, air transport, and therefore where only the CO<sub>2</sub> intensity (with its associated measurement uncertainties) can be measured.

The two charts below present the exposure of your portfolio to the sectors referenced in the IEA scenario. The detailed analysis can be found on the following pages. The analysis covers the most emitting sectors, which account for approximately 70-90% of the greenhouse gas emissions associated with the portfolio. The buildings, forestry and agriculture sectors, which are particularly important in terms of climate, are not covered because of the lack of available data.

The graph shows the distribution of the portfolio you sent by investment class.



Source: 2ii based on GlobalData, WardsAuto, and ICB sector classifications from Bloomberg

# BACKGROUND TO THE MODEL

The 2°C scenario analysis model used to analyze your portfolio is briefly explained below. More detailed information on the model can be found at [www.transitionmonitor.ch](http://www.transitionmonitor.ch).

The model uses as its basis asset level data including power plants, car production plants, oil and gas fields. The model can then be used to associate these assets with companies, their parents, and securities.

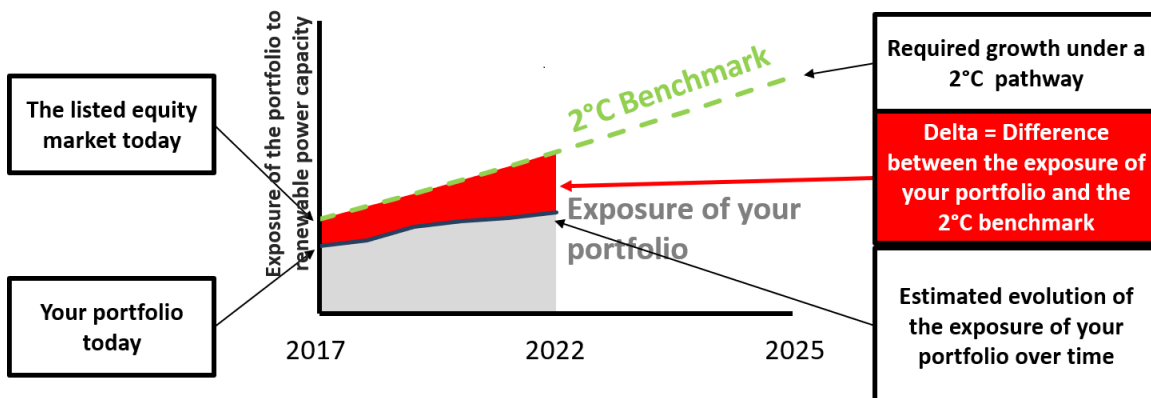
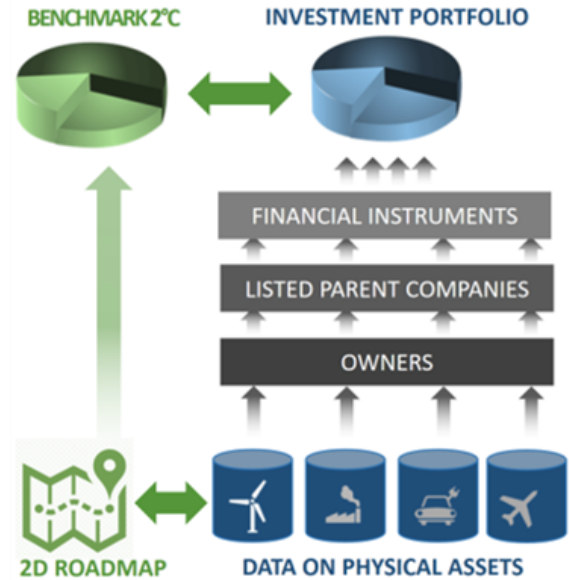
The evolution of the technology exposure in your portfolio is then calculated using the existing investment and production plans of the companies for which you have assets. The method builds on global asset databases for the climate-relevant sectors described on the previous page.

The 2°C benchmark for the global equity market is adjusted to the specific portfolio according to regional exposure and portfolio size. This is necessary to compare the same parameters and to consider regional differences in the 2°C scenarios.

The graph below shows how the method works using renewable power as an example. The starting point of the green line is the average market exposure (for the stock market measured by the ownership share of electricity capacity) in 2017. The green line is given by the IEA's 2°C scenario (450 scenario), based on the geographic exposure of the portfolio. This adjustment is necessary because the 2°C scenario for power capacity has significant geographical differences. For example, the expected expansion of renewable energy in Europe over the next five years is higher than in Russia. This geographic exposure is less relevant for energy and transport, as the scenarios are presented globally.

The starting point of the blue line shows the current status of your portfolio. The slope of this line is a function of the portfolio-specific expansion plans for renewable energy capacity, based on the currently known investment and production plans of the companies in your portfolio. The gap between the two lines represents the difference between the exposure of your portfolio to technologies and the 2°C benchmark. This shows whether your portfolio is over or under-exposed to renewable energy compared to the 2°C benchmark.

The model measures the exposure of the portfolio to different climate-relevant technologies (for example, coal, petroleum, gas or renewable sources) and compares this exposure over a 5-year time horizon with the 2°C benchmark.



# BACKGROUND TO THE MODEL

## MODELLING PRINCIPLES

The following briefly summarizes the key modelling principles:

- The model calculates the expected 'market' exposure for each technology in the specific asset class by taking the current exposure in the respective asset class and geography (taking into account the markets in which the portfolio is invested and their regional exposures) and adding the 2°C trend line as defined in the scenario. The build-out percentages take a simple 'fair share principle' under which the companies in the investable universe are assumed to keep their market share constant and by extension their 'contribution' to the 2°C goal;
- The model assesses the 2°C alignment of financial portfolios with a 5-year time horizon / forecast period. The time horizon is limited to the time horizon of capital expenditure planning for which data can be tracked at a meaningful level;
- The model applies traditional financial accounting principles, notably where possible the equity share principle (e.g. 1

## DATA

The model sources, where possible, forward-looking (e.g. future production plans) asset-level data for key technologies in order to provide for geography-specific assessments for specific business segments mapped to the company level. It thus bypasses wherever possible backward-looking, corporate level reporting, although such reporting can be used for validating forward-looking parameters (e.g. GHG emissions).

## SCENARIOS

As outlined above, the underlying principle of the model is to compare the portfolio trends with a 2°C scenario. The model for this pilot relies on the International Energy Agency 2°C scenarios (labelled the 450 or 2D Scenario). A common, internationally recognized scenario framework was chosen to ensure comparability across results. The choice of the scenario should not be interpreted however as an endorsement of the underlying assumptions within the model and does not constitute an implicit or explicit assumption around the alignment with long-term Swiss climate policy positions.

The IEA historically has assumed significant amounts of nuclear power and carbon capture and storage in their scenarios. In addition, the international community has accelerated their global target from the 2°C goal to well below 2°C with a target of 1.5°C. In order to reflect this uncertainty, the project will as part of its meta-analysis seek to explore the implications of other scenarios. In addition, it is important to highlight that each investor can and may want to take an individual view on the likely decarbonization scenario that may or may not relate to the scenarios modelled by the International Energy Agency or others.

To respond to this potential interest, investors participating in the pilot can provide different scenarios as additional elements to test again if they desire. For further details on options and requirements for this, please email [transitionmonitor@2degrees-investing.org](mailto:transitionmonitor@2degrees-investing.org).

## CAVEATS / NOTES ON INTERPRETING THE RESULTS

The following briefly highlights key caveats to the model and the results:

- The forward-looking data is based on current 'revealed' plans from companies and is subject to change. The estimates should thus not be interpreted as final forecasts, but rather the current plans of companies if they don't change. Another way to interpret the results is the call for action with regard to the required change to align with the 2°C economic trend. Given the 5 year time horizon, there is a high degree of certainty that plans will still change in some way over time. Similarly, the participating financial institutions can of course alter their portfolio exposures over time. The analysis however seeks to be a point in time assessment of future exposures under current conditions.
- The model takes a diversified 'market portfolio' as a basis, focusing on key technologies reflected in the IEA roadmaps. By extension, thematic portfolios invested in breakthrough technologies and / or SRI portfolios with a range of environmental, social, and governmental considerations may not value these elements.

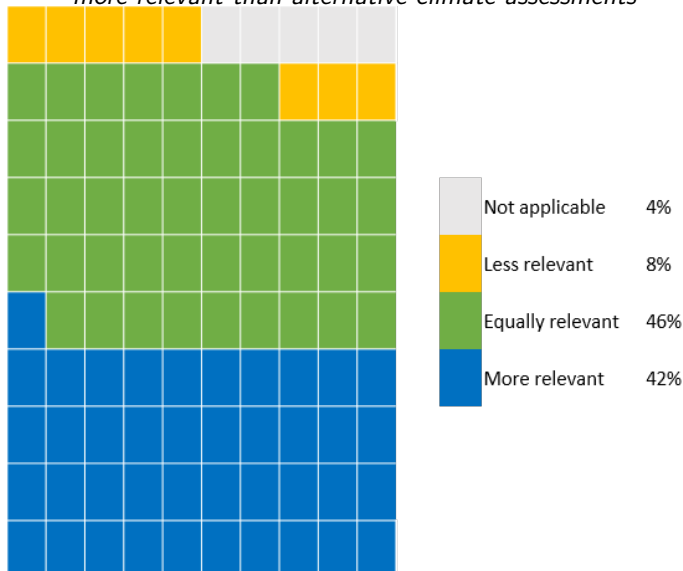
# FEEDBACK ON THE MODEL

Since launching the assessment, 100 investors across 16 countries have committed to testing their listed equity portfolios, testing approximately 350 billion USD of equity, as well as 20 investment products. Following the first round of road-test, the 2° Investing Initiative has initiated feedback on the model, including investor interviews, third-party consultations, as well as a quantitative survey among the investors who have road-tested the model. The key results can be summarized as follows:

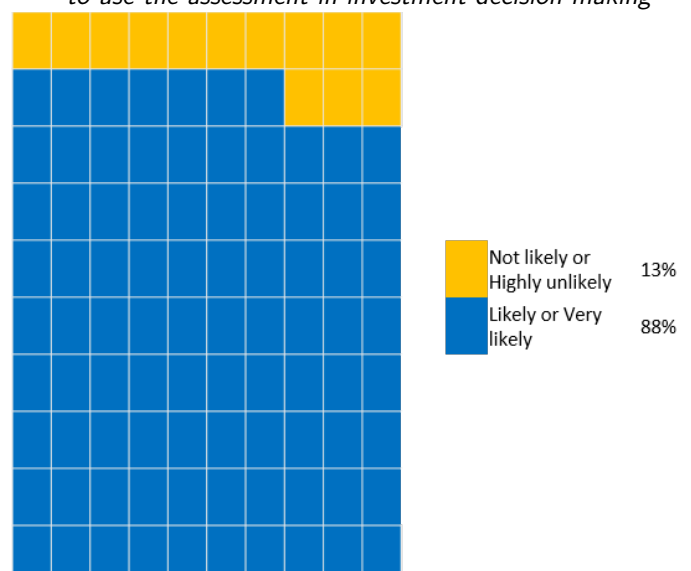
- **21 out of the 24 (88%) investors surveyed said the model was ‘equally relevant’ or ‘more relevant’ than the existing climate assessments.** Of the 3 investors that responded they found it less relevant, they were still likely to use it, with one of the investors suggesting its use in “identifying companies to engage with regarding future business plans”. Another investor criticized the limited scope but suggested he or she would use it upon expansion.
- **21 out of 24 (88%) investors said they were likely to use the assessment in investment decisions either now or are as part of portfolio tool on a financial database.** Interestingly, the qualitative feedback and comments suggests the use case is quite different between investors, with some seeing it as a tool for engagement (“inform discussions [with companies] on stranded asset/climate risk in relation to future plans”) and others for stock-picking (“design of climate-related targets”). Of the three investors who said they were not likely to use the assessment, one wrote that they only use external managers and thus were more likely to use the tool “as a check”. Another investor criticized the current scope arguing for the need to expand it to other sectors and asset classes, but still found the tool “more relevant’ than their existing assessments. The final investor provided written feedback that they “have used it because it is said to be the most relevant tool in the field at the moment and we will wait for it to expand to emerging markets and different asset classes.”

Key strengths of the model were considered to be its forward-looking nature, reliance on asset-level data, use of science-based benchmarks, and sector-specific analysis. Its weaknesses were its lack of coverage in terms of asset classes, geographies, and sectors, all three of which are currently being addressed.

21 of 24 (88 %) participants said the model was equally or more relevant than alternative climate assessments



21 of 24 (88 %) participants said they were likely or very likely to use the assessment in investment decision making



**Q: Where can I find more information about the project?**

*A: You can find more information about the project at [www.transitionmonitor.ch](http://www.transitionmonitor.ch) including the briefing material, data templates, the results of investor feedback, and further information and links related to this project.*

**Q: Will my portfolio information be kept confidential?**

*A: 2° Investing Initiative commits to keeping all portfolio information confidential. Portfolio data will be stored in a password-protected folder. All analytical results will be shared exclusively with the respective pension fund and insurance company, with only anonymized results used for meta-analysis. The names of participating investors will not be shared.*

**Q: What asset classes are covered in the pilot?**

*A: The pilot will be limited to listed equity and corporate bonds portfolios.*

**Q: How is this analysis different from a carbon footprint?**

*A: The pilot orients itself after the draft recommendations of the FSB Task Force on Climate-Related Financial Disclosures calling for 2°C scenario analysis and the Paris Agreement objective of aligning financial flows with climate goals. As a result, it emphasizes this aspect. To date, carbon footprint data does not cover forward-looking, scenario specific questions and thus cannot be used for such an assessment.*

**Q: Is this a risk analysis?**

*A: The test specifically does not claim to quantify the risk to your fund. The analysis provided can however help to inform on this question by demonstrating potential alignment or misalignment with economic trends, as defined by the IEA.*

**Q: What should I do if I invest in funds?**

*A: Investors are kindly asked, where possible, to provide information on direct holdings in individual securities. All information provided in the form of investments in funds will be matched to a funds database that 2ii has access to. It cannot be guaranteed that funds information can be retrieved in all cases. As a result, direct provision of ownership of individual securities is recommended where possible.*

**Q: Why is the analysis based on the 2ii model? Why can't I apply my own analysis?**

*A: The analysis is based on the 2ii model given its nature as the only approach to measuring 2°C alignment of financial portfolios, as well as open-source access. The choice of one model ensures comparability of results.*

**Q: What if I want to find out more and do further analysis?**

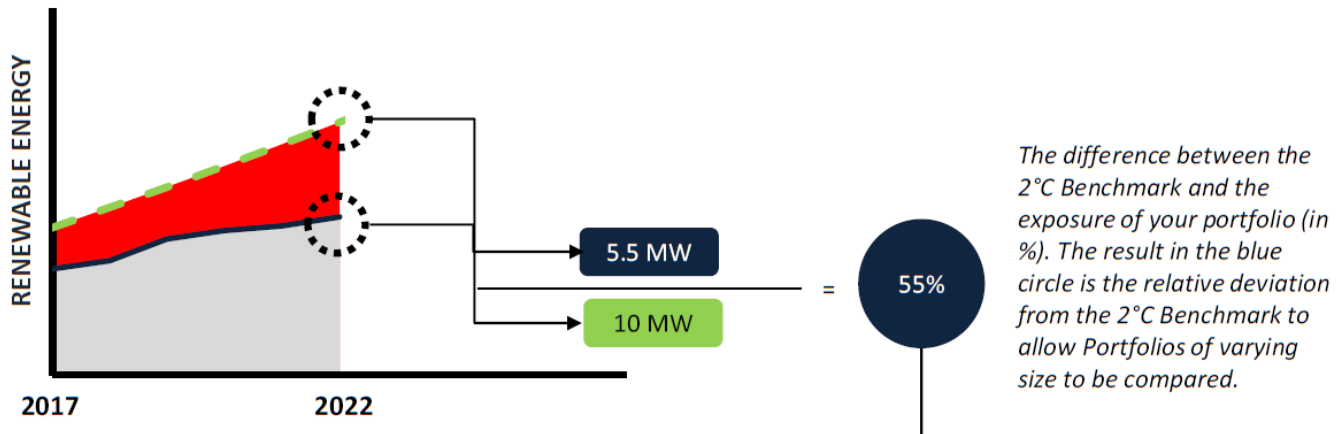
*A: The project provides a common, simple assessment framework in line with best practice, as established by the International Award on Investor Climate-related Disclosures in 2016. However, it of course doesn't preclude you from contacting commercial data providers and investment consultants for further analysis.*



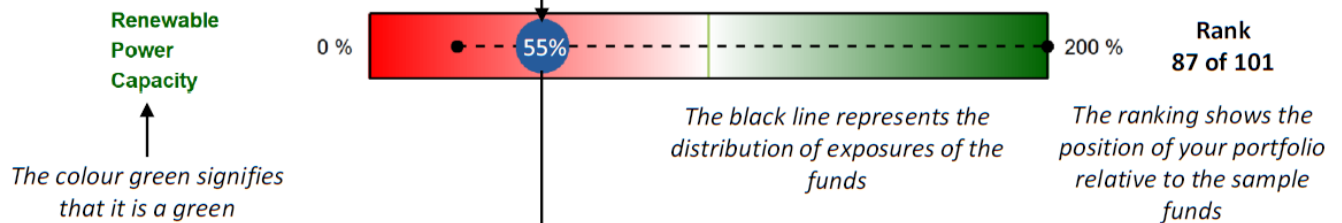
# HOW DO I INTERPRET THE RESULTS?

The following is a brief explanation of the graphs that you will see on the next pages. The results are all based on the model description previously outlined.

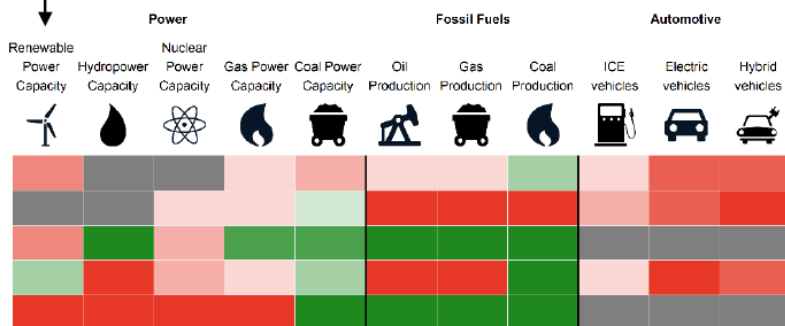
- First, the model quantifies the evolution of the exposure over the next 5 years to specific technologies (for example, renewable energy capacity) and then compares this exposure with the 2° C benchmark.



- The results are then shown in a bar graph, including the specific technology weighting of the portfolio and the comparison with the 2° C benchmark, the distribution of the results of a sample 100 European funds, and your ranking in comparison to those funds.



- If the analysis is based on submitted funds, the results can then be summarized in a "Heatmap" graphic for all funds.

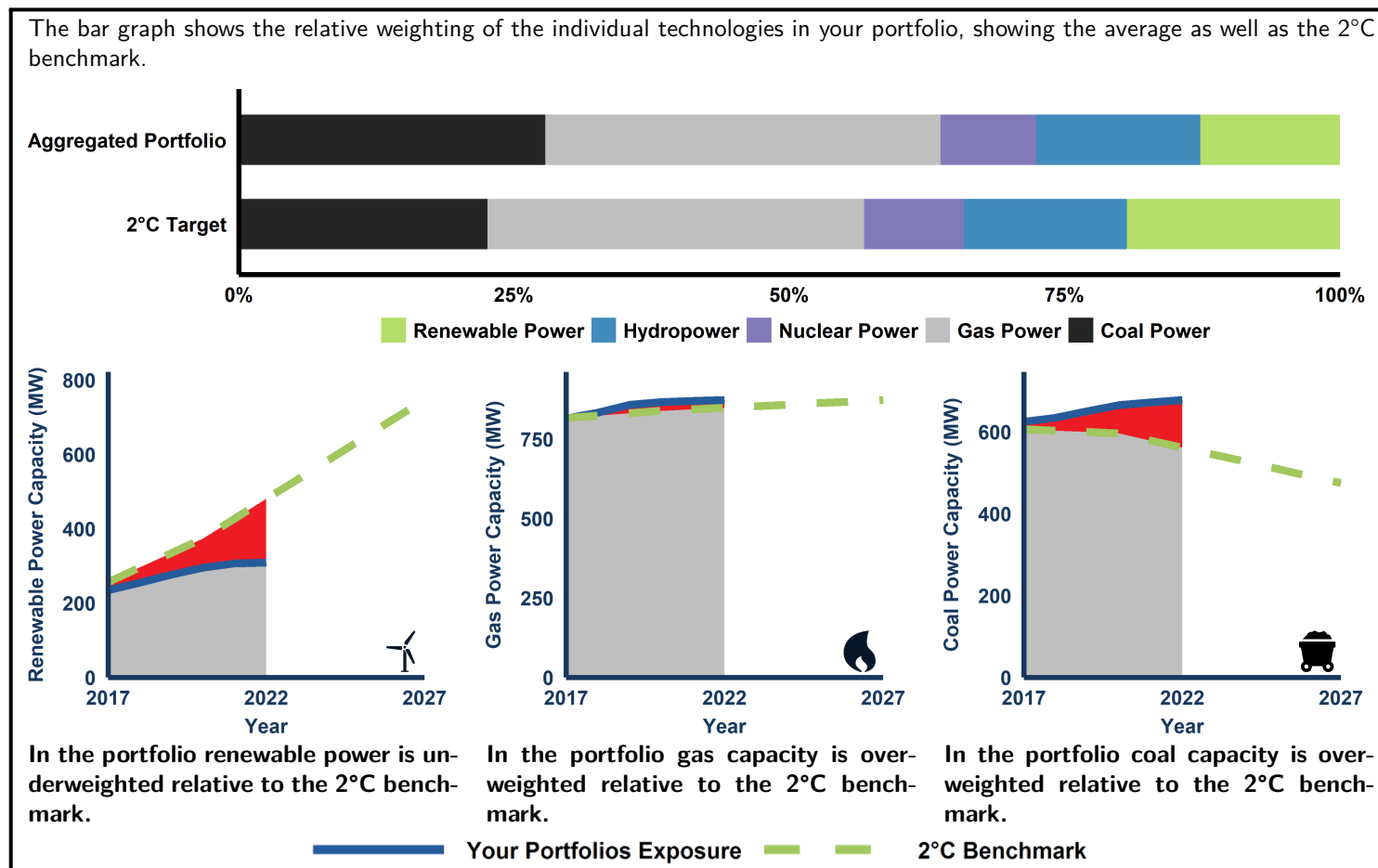


If you have sent us individual funds, you will find an overview of the results for up to 20 funds. In summary, only the black number in the circle per technology as well as with the colour coding the ratio to the 2 ° C benchmark is represented. Green signals a climate tolerable exposure, red signifies climate-intolerant, which corresponds approximately to a 4 ° C to 6 ° C target path.

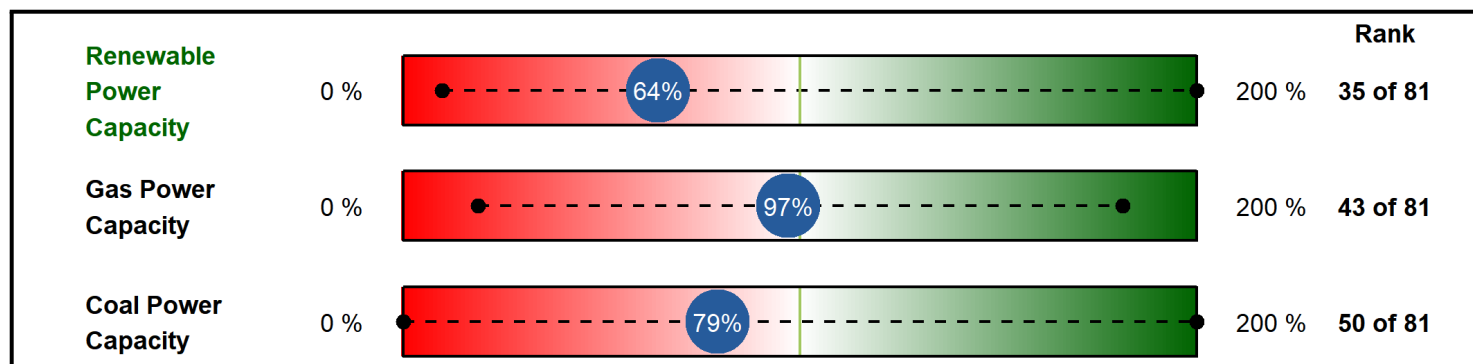
## **SECTION 2: SECTOR & PORTFOLIO ANALYSIS**

# ELECTRIC POWER - EQUITY PORTFOLIO

The results presented on this and the next page summarize the exposure of your equity portfolio for electric power relative to the 2°C benchmark. The results are presented in detail for the generation of electricity from renewable energies (sun, wind, biomass) as well as from fossil fuels (coal, gas). The results for hydropower and nuclear energy are presented on the overview page at the end of this section.



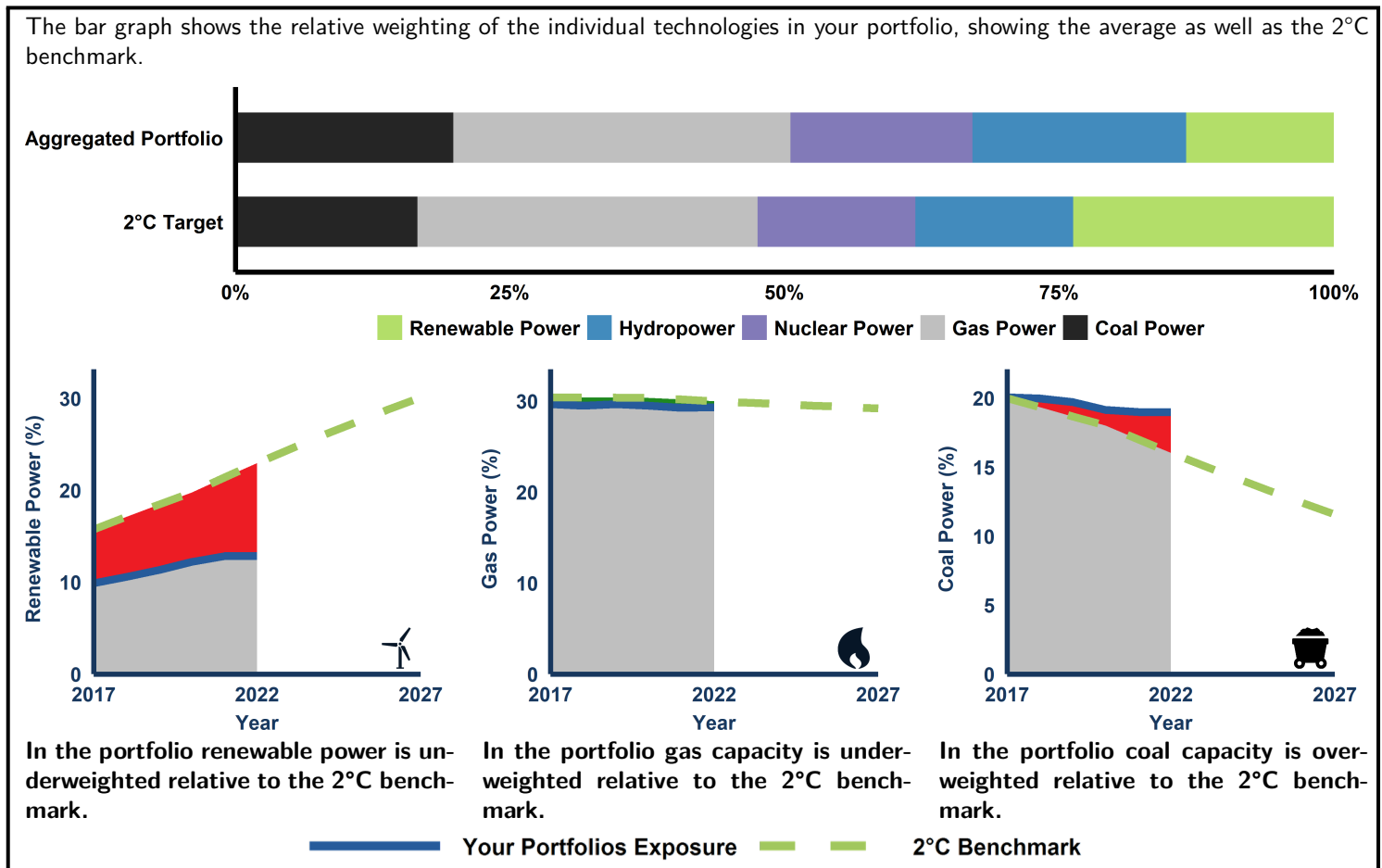
The blue circle in the ranking chart represents the difference between the blue and the green line (in %, see line graph above). The distribution of the results (black line), and the technology ranking, illustrate the ranking of your portfolio compared to other portfolios analyzed.



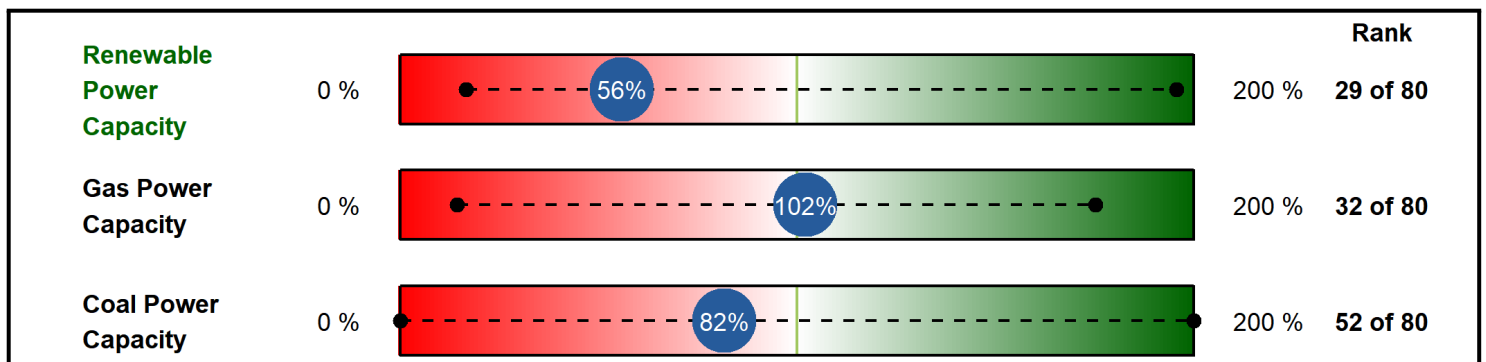
Source: 2ii based on GlobalData, IEA 2016

# ELECTRIC POWER - CORPORATE BONDS

The results below show the 2°C scenario analysis for the electricity sector for your corporate bond portfolio. For methodological reasons, the results of the graphs are not expressed in MW, but in percentages indicating the relative weight of the technologies in the portfolio.



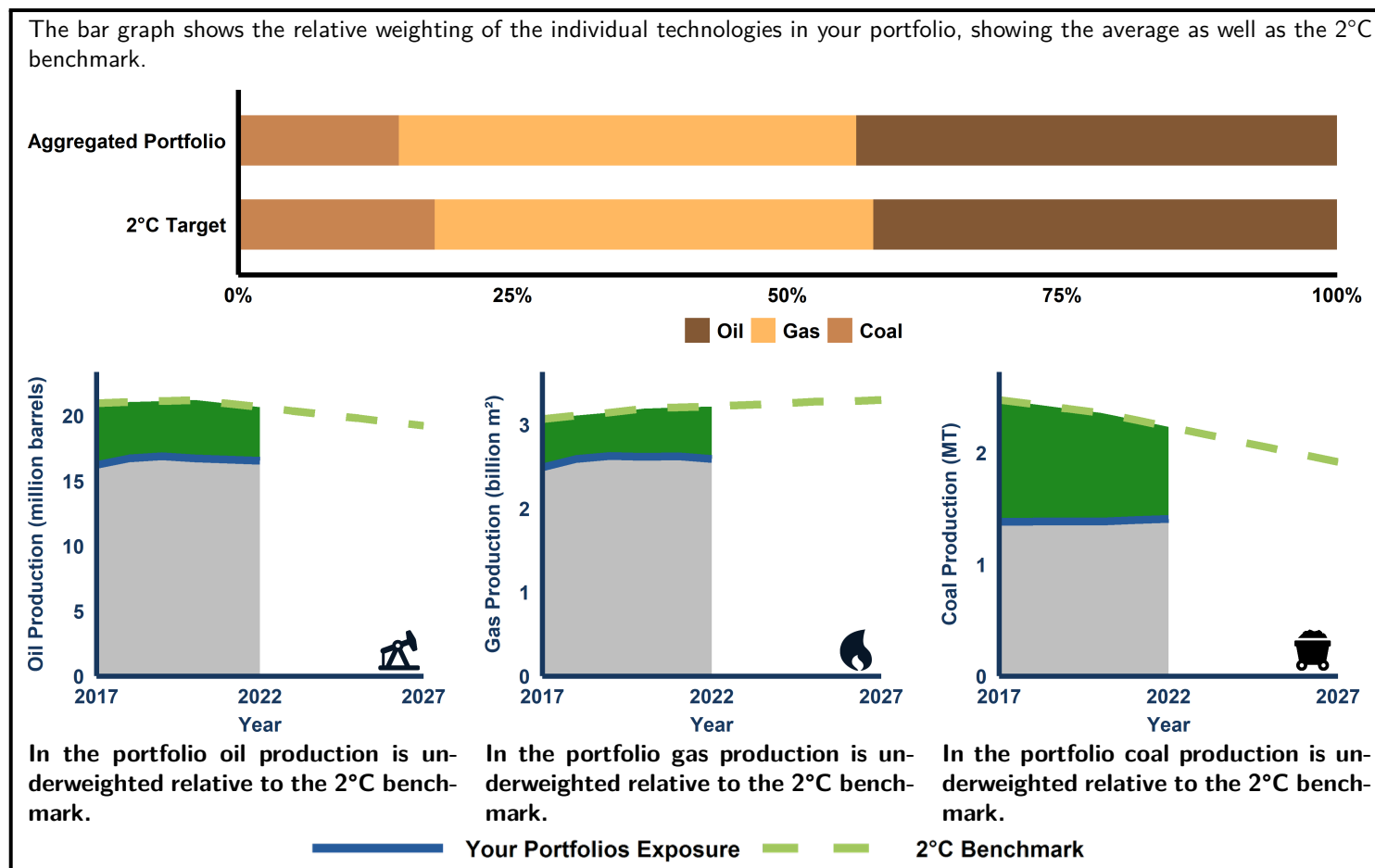
The blue circle in the ranking chart represents the difference between the blue and the green line (in %, see line graph above). The distribution of the results (black line), and the technology ranking, illustrate the ranking of your portfolio compared to other portfolios analyzed.



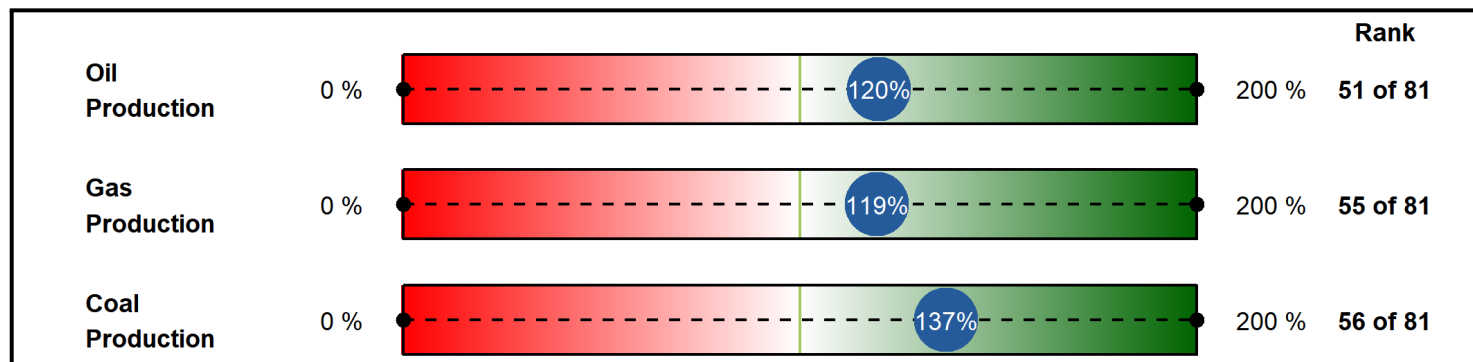
Source: Iii based on GlobalData, IEA 2016

## FOSSIL FUELS - EQUITY PORTFOLIO

The results presented on this page include the energy sector (oil and gas production as well as coal production) relative to the 2°C benchmark. The analysis of oil and gas production as well as coal production cannot be presented directly with a technology mix of green and brown technologies, as the green alternatives are not available directly in this sector. The analysis of the production of oil, gas and coal is presented in relation to the maximum production permitted in a 2°C scenario. The scenario 2°C foresees an absolute reduction in production of oil, gas and coal. Therefore, unlike the analysis of the automotive and energy sectors, production thresholds are defined according to the overall size of the portfolio. This means that the oil, gas and coal intensity of the portfolio is measured as a whole.



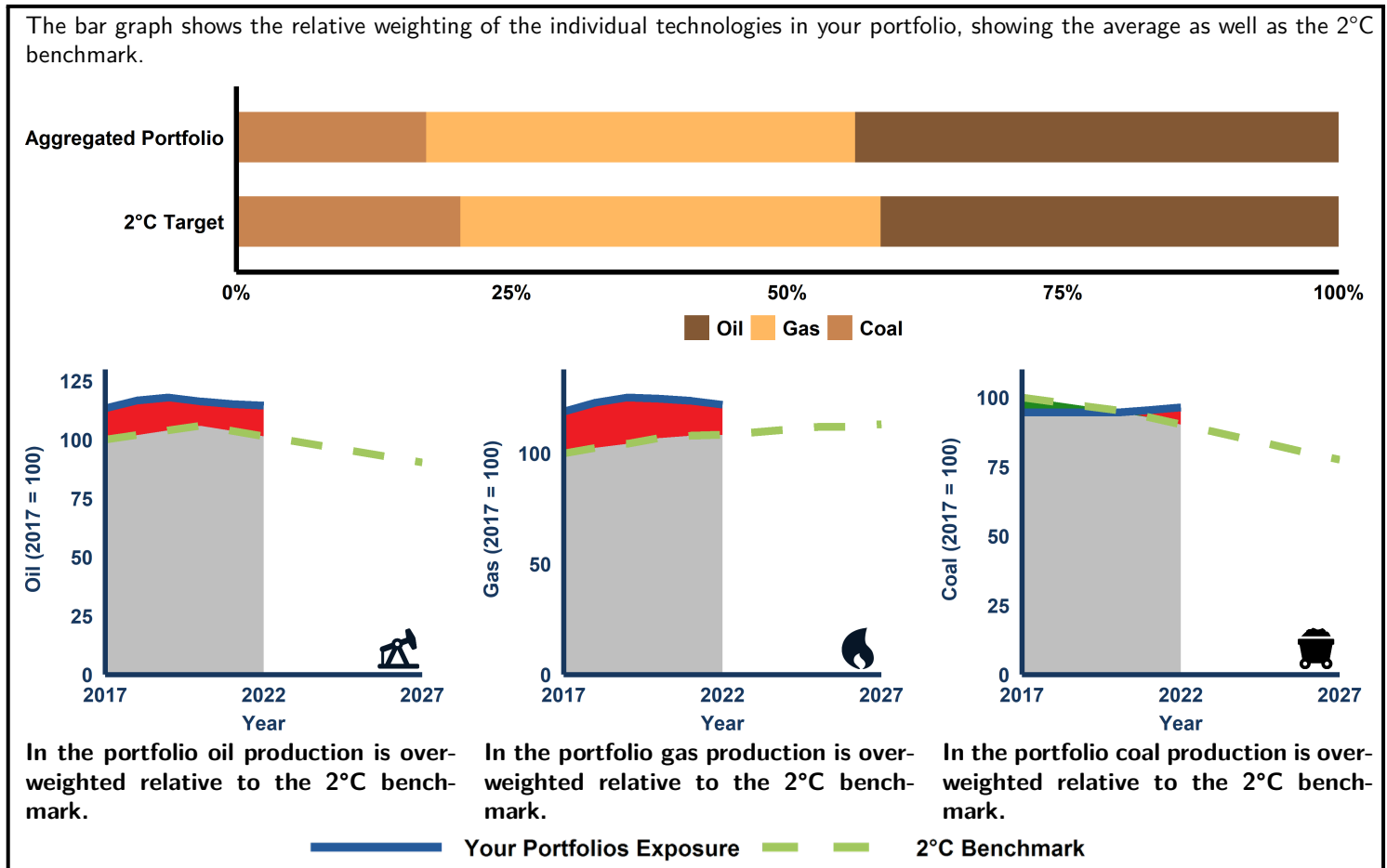
The blue circle in the ranking chart represents the difference between the blue and the green line (in %, see line graph above). The distribution of the results (black line), and the technology ranking, illustrate the ranking of your portfolio compared to other portfolios analyzed.



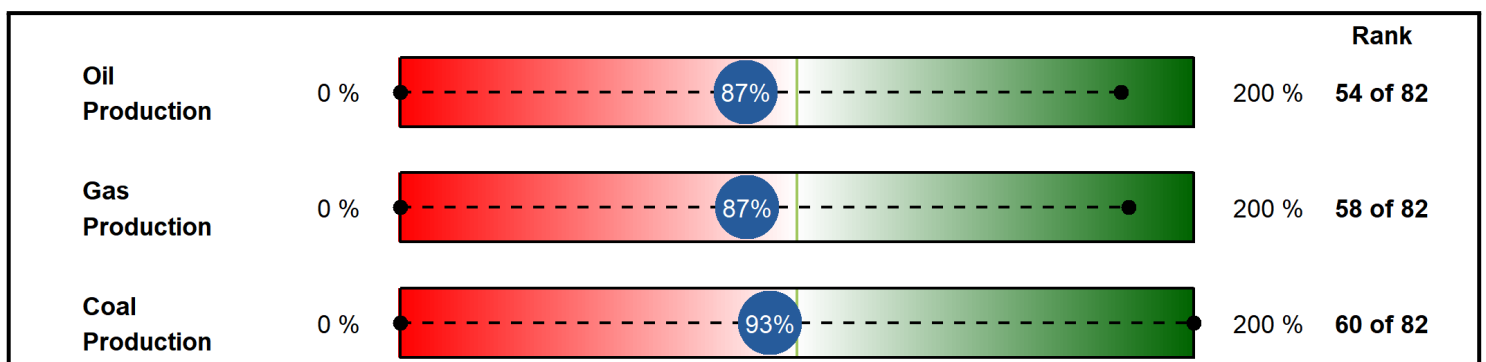
Source: 2ii based on GlobalData, IEA 2016

# FOSSIL FUELS - CORPORATE BONDS PORTFOLIO

The results below show the 2°C scenario analysis for the energy sector for your corporate bond portfolio. They are represented in the same way as on the previous page. The results are summarized as follows:



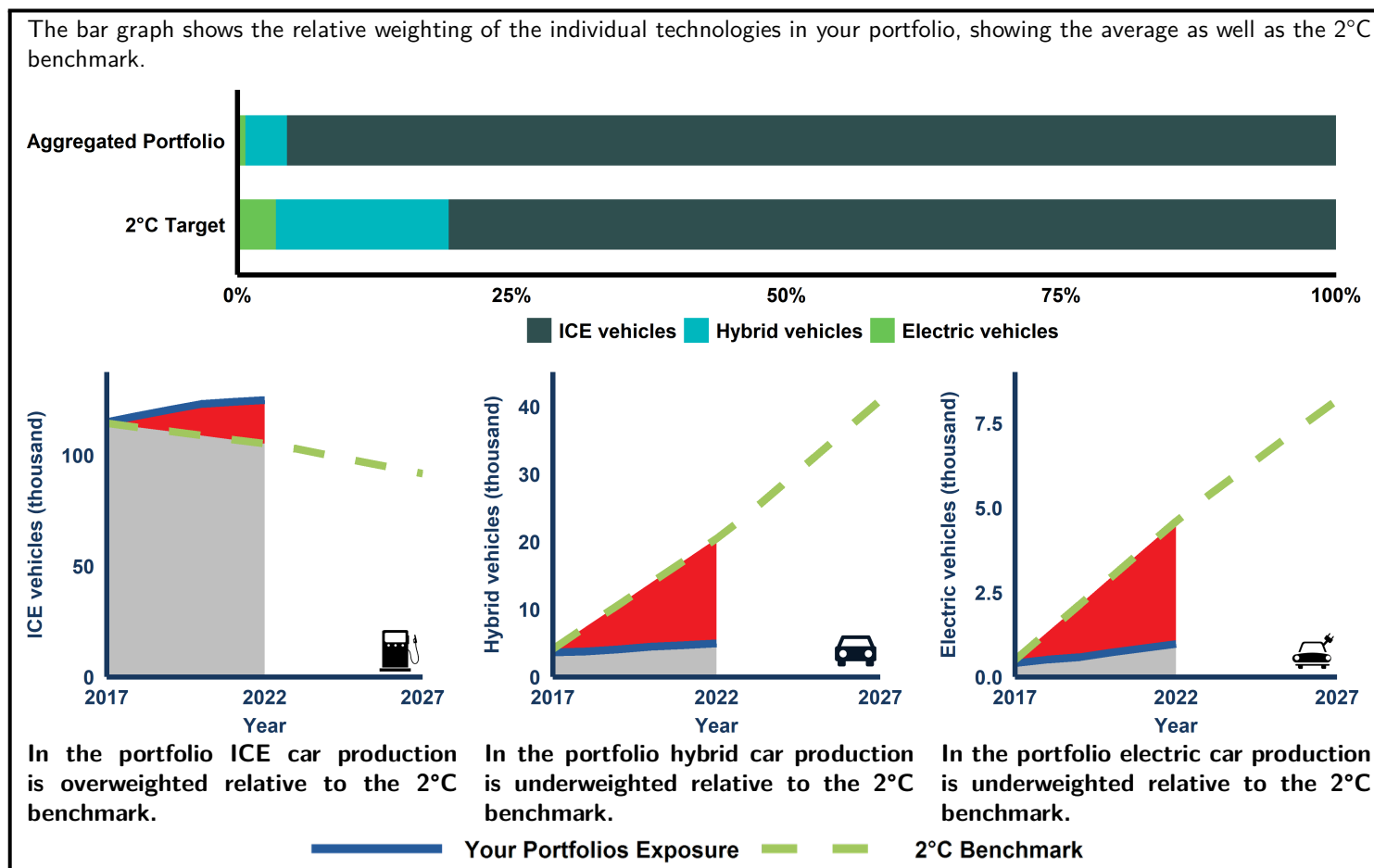
The blue circle in the ranking chart represents the difference between the blue and the green line (in %, see line graph above). The distribution of the results (black line), and the technology ranking, illustrate the ranking of your portfolio compared to other portfolios analyzed.



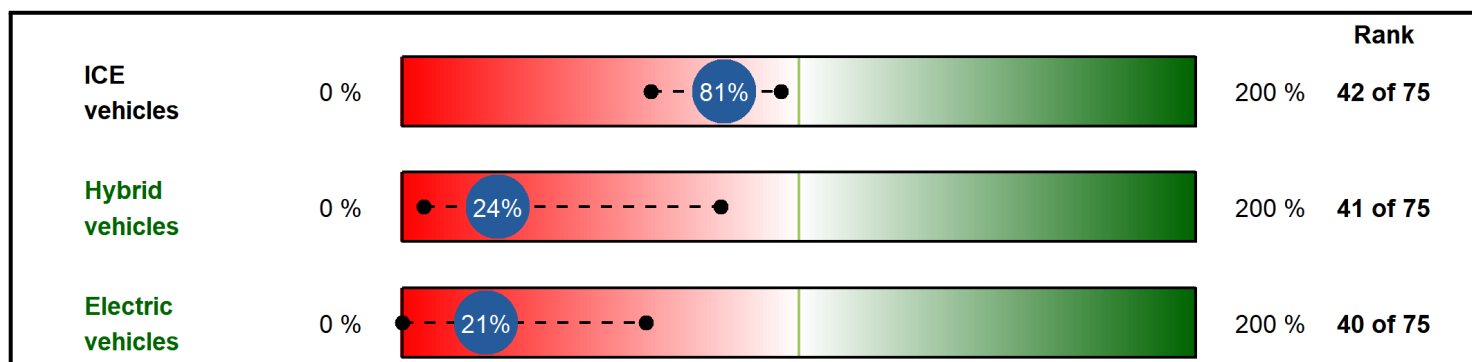
Source: 2ii based on GlobalData, IEA 2016

# AUTOMOBILE SECTOR - EQUITY PORTFOLIO

The results presented on this and the next page cover the analysis of exposure in the automotive sector relative to the 2°C benchmark. The results focus on three of the most important technologies in the automotive sector - cars with internal combustion engines (petrol, diesel), hybrid cars (combination of internal combustion engines and electric drivetrain), and electric cars. According to the IEA, the relative market share of alternative vehicles will remain relatively low in the next 5 years, although it is set to grow significantly. The share under a 2°C scenario will continue to grow exponentially after the next 5 years.



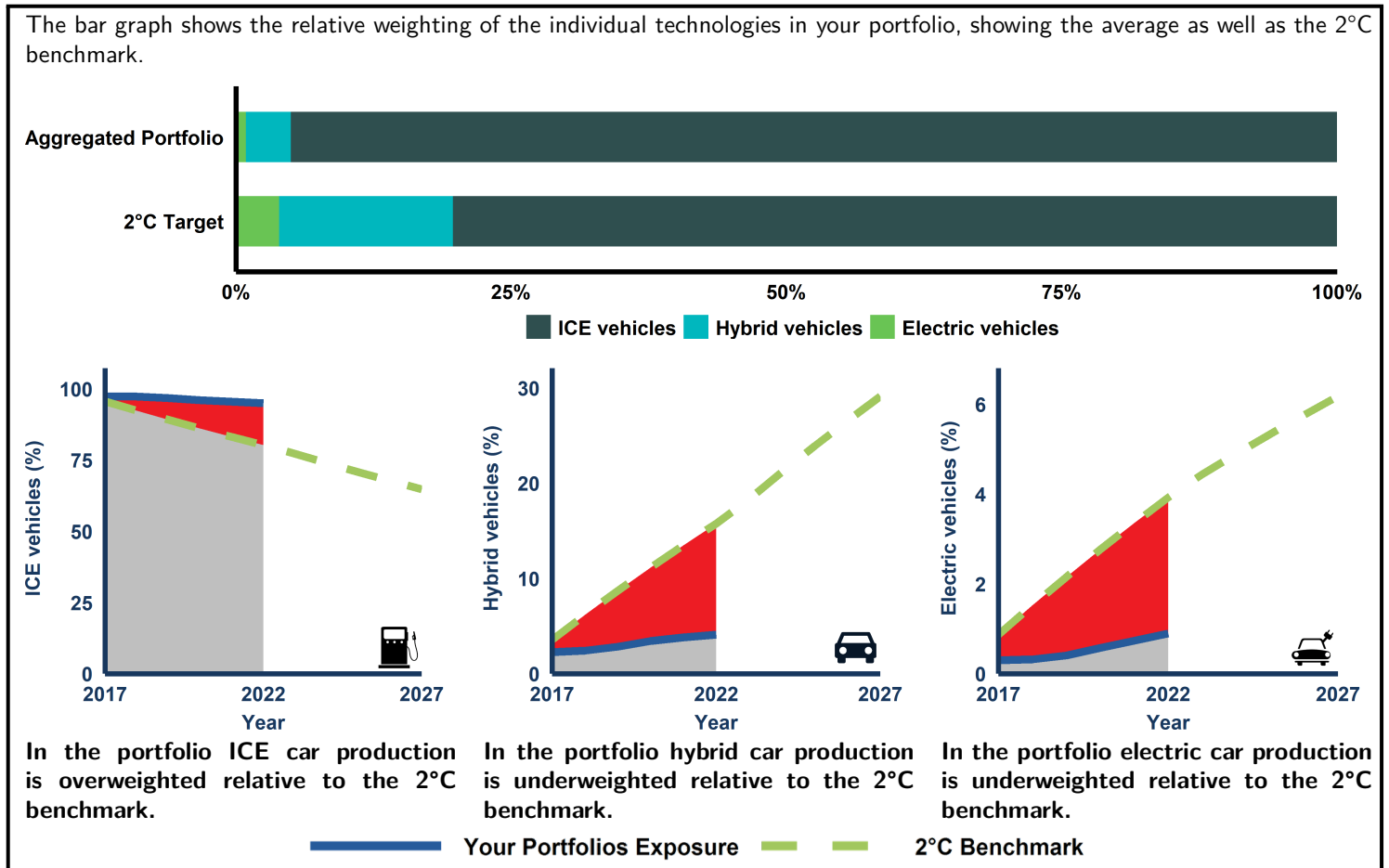
The blue circle in the ranking chart represents the difference between the blue and the green line (in %, see line graph above). The distribution of the results (black line), and the technology ranking, illustrate the ranking of your portfolio compared to other portfolios analyzed.



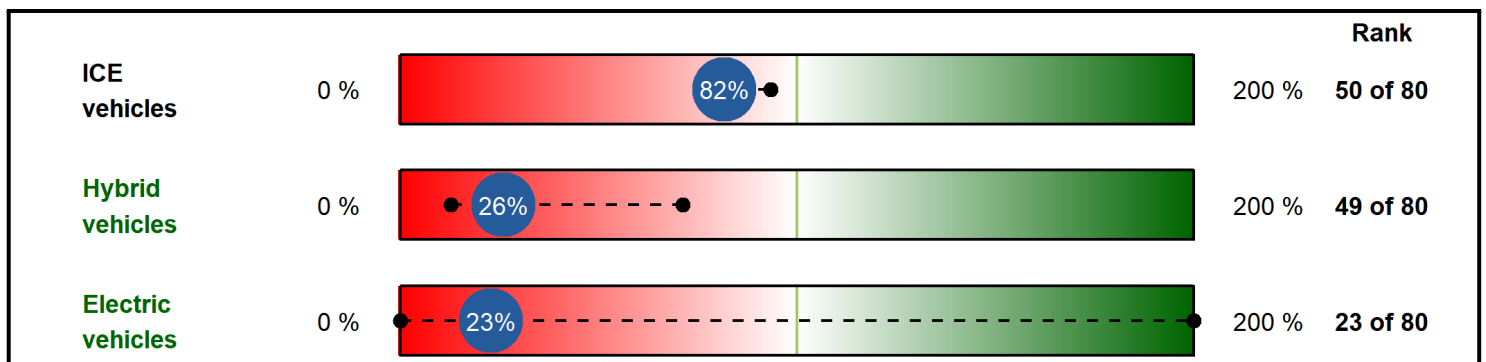
Source: 2ii based on WardsAuto / AutoForecastSolutions, IEA 2017

# AUTOMOBILE - CORPORATE BONDS PORTFOLIO

The results below show the 2°C scenario analysis for the automotive sector for your corporate bond portfolio. They are based on the same visuals seen on previous pages. In the automotive sector, the principle of relative portfolio value is used as well as the basis for the analysis of the corporate bond portfolio.



The blue circle in the ranking chart represents the difference between the blue and the green line (in %, see line graph above). The distribution of the results (black line), and the technology ranking, illustrate the ranking of your portfolio compared to other portfolios analyzed.

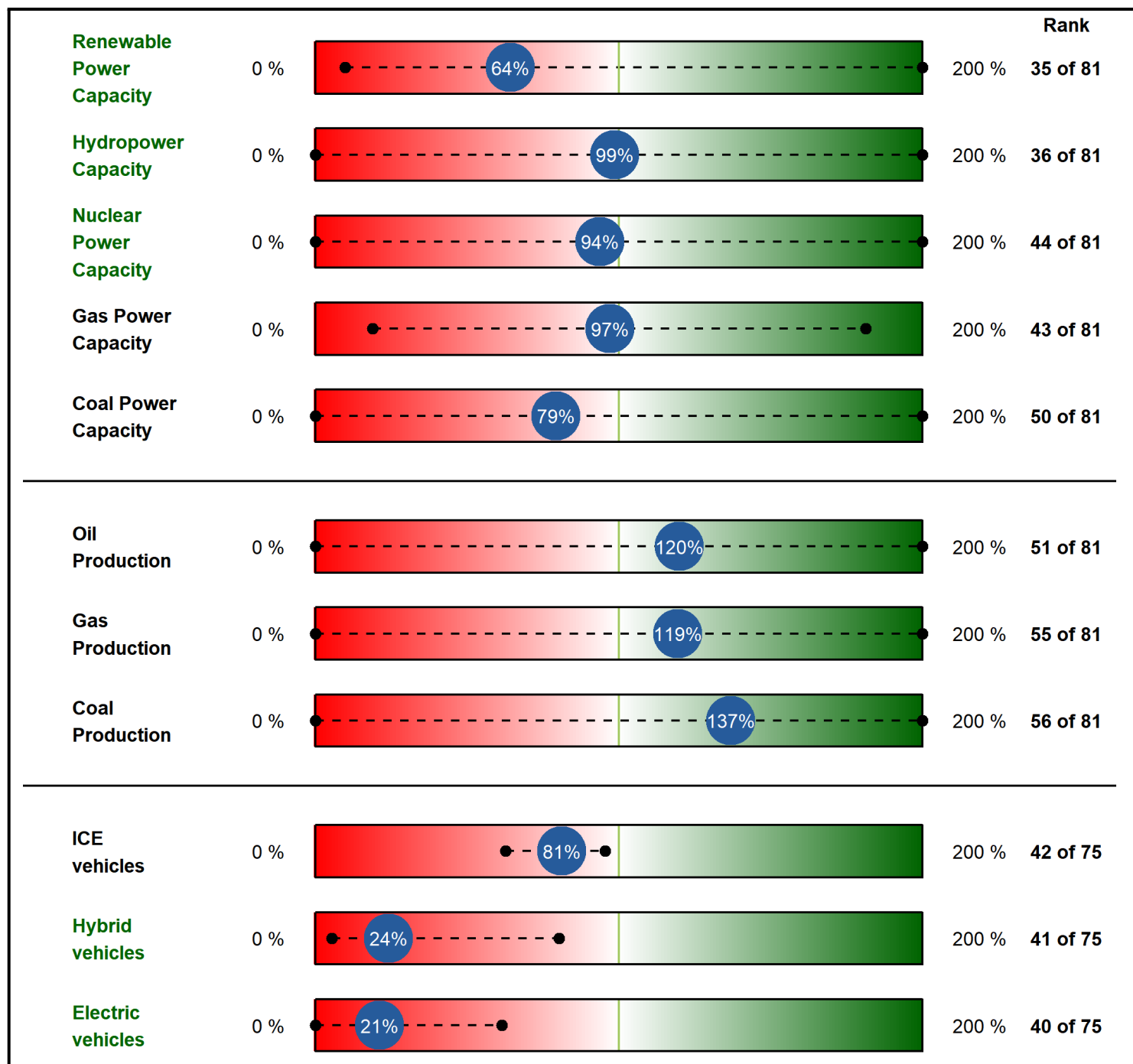


Source: 2ii based on WardsAuto / AutoForecastSolutions, IEA 2017



## SUMMARY - EQUITY PORTFOLIO

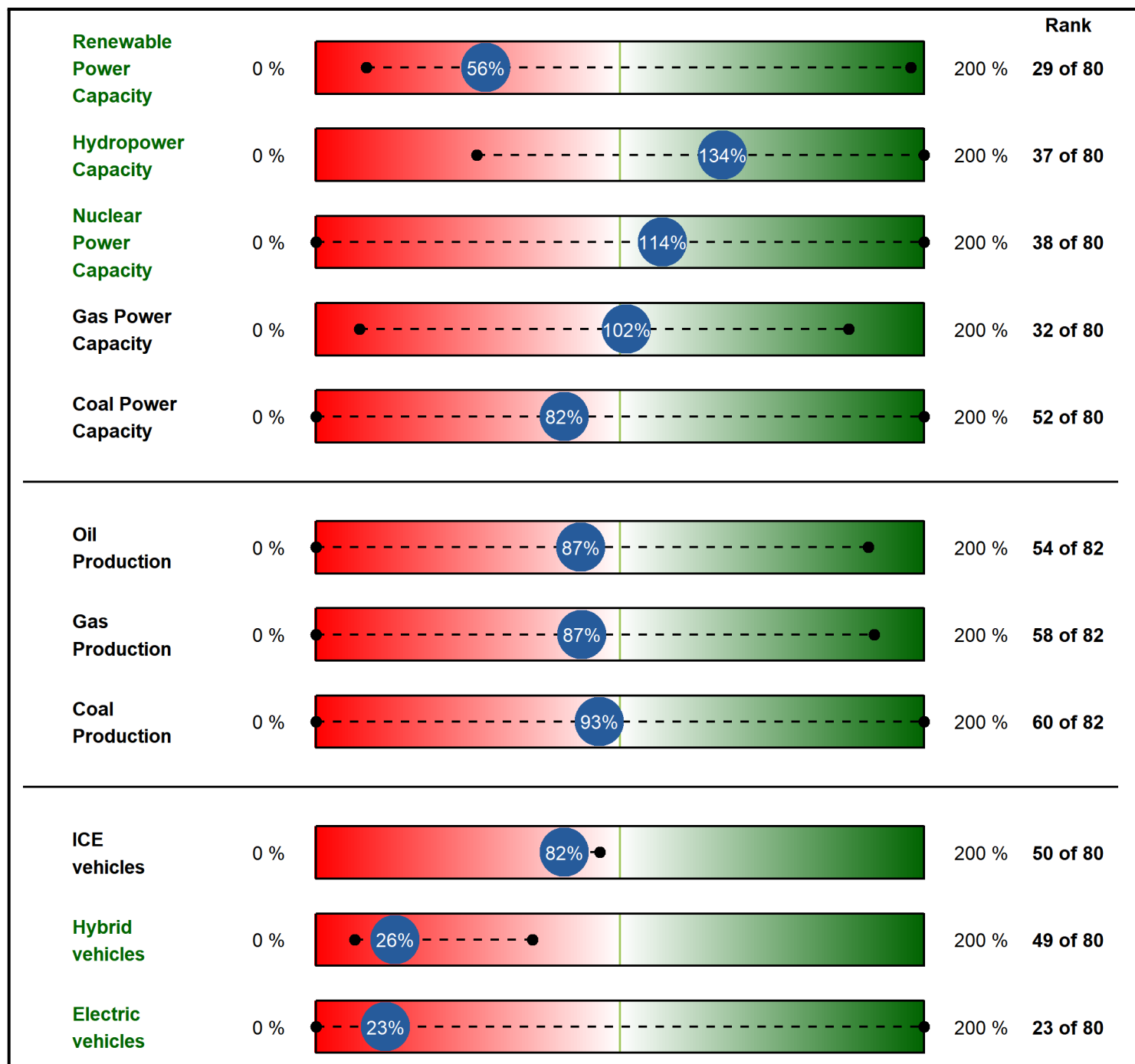
The following table summarizes the results for your equity portfolio. In addition to the results shown on previous pages, you can also see the results for hydropower and nuclear power, since these were not integrated in the sector analysis (given space constraints).



Source: 2ii based on GlobalData, WardsAuto / AutoForecastSolutions, IEA 2017

## SUMMARY - CORPORATE BONDS PORTFOLIO

The results of your bond portfolio are summarized in the table below. In addition to the results from previous pages, you can also see the hydro and nuclear results as they were not included in the sector analysis (given space constraints).



Source: 2ii based on GlobalData, WardsAuto / AutoForecastSolutions, IEA 2017

## OTHER SECTORS – CEMENT & STEEL

As mentioned in the introduction to this report, there are a number of sectors for which no zero carbon technology exists or has yet been modeled by IEA 2°C scenarios (not considering partial substitutes, such as wood for cement). This applies in particular to the steel, cement, ship and air transport sectors. These sectors are therefore analyzed here.

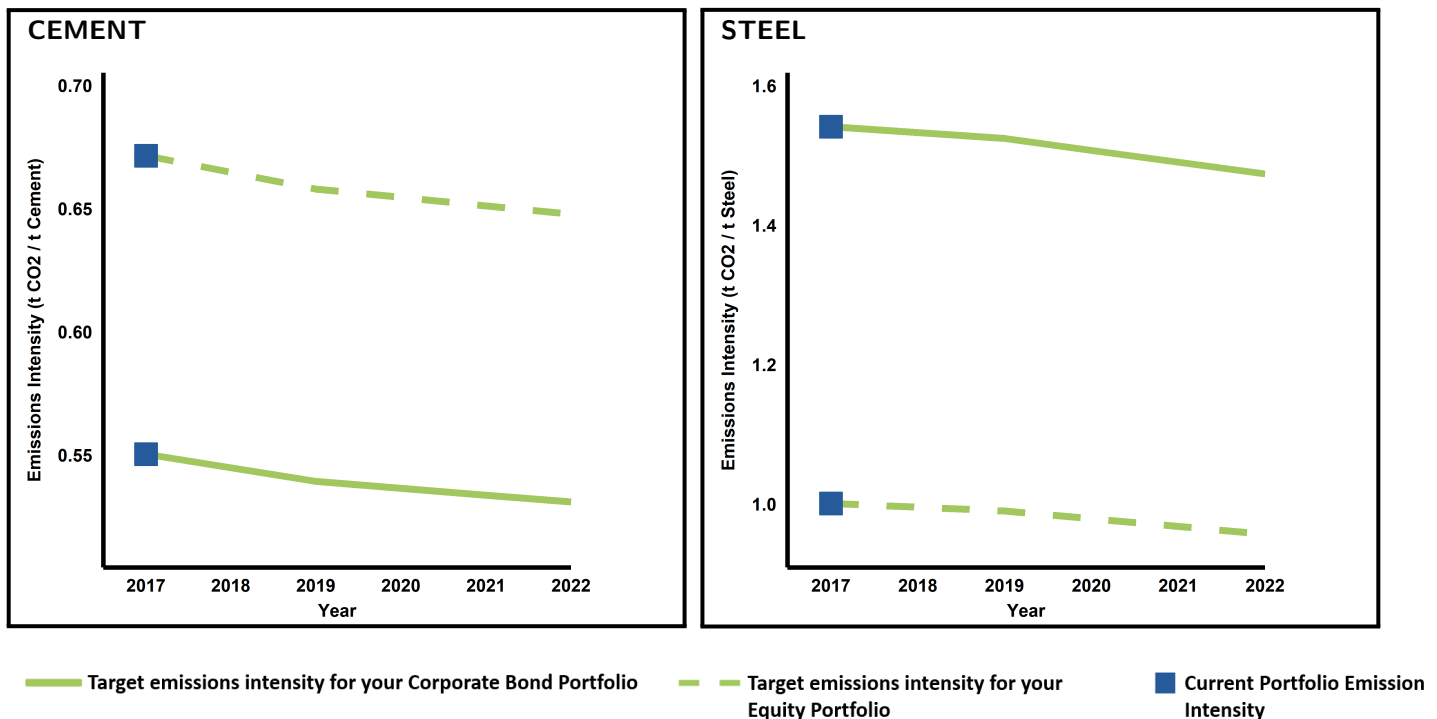
For these sectors, decarbonisation efforts will be confined to increasing efficiency in production and use, as well as investment in research and development in the next 5-10 years, in order to bring CO<sub>2</sub>-neutral alternatives to market maturity in the medium term. As a result, both the scenarios and the data are relatively imprecise.

The figures presented here are based on external CO<sub>2</sub> intensity estimates, themselves based on a publicly available emission estimation model developed by the 2° Investing Initiative together with the consulting company EY. For shipping, an external CO<sub>2</sub> rating model, developed by Rightship and the Carbon War Room has been used. Since this model is estimated externally and top-down, it is associated with some uncertainties. The results should therefore be considered as estimates, in contrast to previous analyses in the energy, electricity and automotive sectors. In the following paragraphs, the sectors are considered individually.

After chemicals, steel production is the second largest energy consumer among industrial sectors, and the most carbon-intensive sector. The deployment of electric arc furnaces is key to reducing emissions (even if this technology remains carbon-emitting). The rate of deployment of this more efficient process is therefore presented in combination with the intensity of CO<sub>2</sub>. If your portfolio is invested in these sectors, the results illustrate the estimated carbon intensity per tonne of steel and cement produced for the equity/bond portfolio as well as the benchmark 2°C. The results are based on the sectoral decarbonization pathways defined by the Science-based Targets Initiative, developed by WWF, WRI and CDP.

These results can serve as a starting point for discussions with steel producers on carbon intensity and strategies consistent with a 2°C climate objective. The data presented here are unfortunately too imprecise for the implementation of portfolio allocation strategies.

Your equity and corporate bond portfolio shows a higher CO<sub>2</sub> intensity than the 2°C benchmark in 2022. The estimate also shows that in your equity portfolio in 2022, steelworks with an electric arc furnace are weighted higher than the average. However, a comparison of this result with a 2°C benchmark is not possible.



Source : 2ii, based on 2ii/EY 2016, PlantFacts, IEA 2017 and SDA 2015

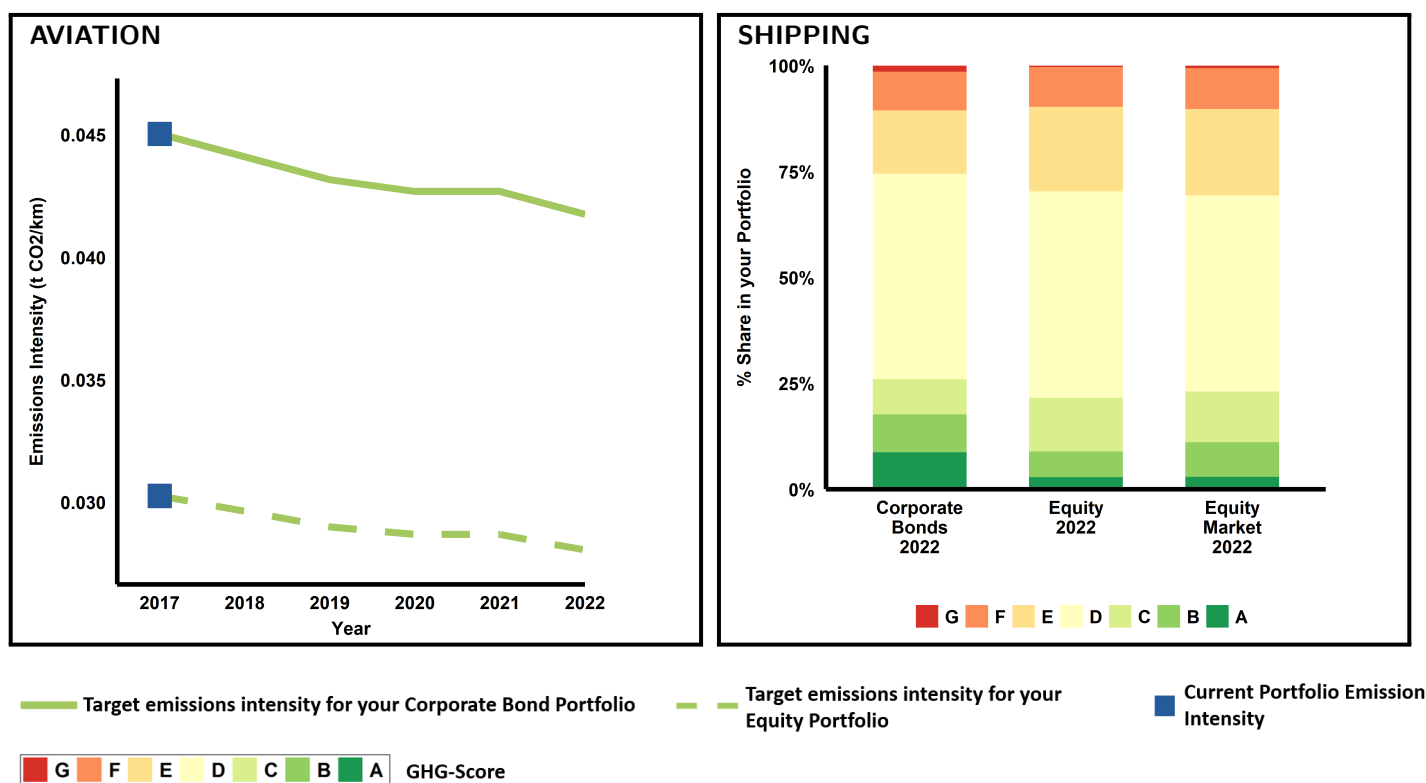
## OTHER SECTORS – AVIATION & SHIPPING

For the shipping and aviation industries, the same focus is on CO<sub>2</sub> intensity as for steel on the previous page.

For the aviation sector, we used the Sectoral Decarbonization Approach (SDA) of the Science-Based Target (SBT) project: the curve of the 2°C trajectory takes as a starting point the current portfolio situation, the sector average. To convert aircraft fleets into CO<sub>2</sub> emissions, we had to define assumptions on aircraft utilization rates. This introduces a level of uncertainty that does not allow a comparison between airlines. Furthermore, it is important to note that we have only carried out the analysis for the transport of passengers, the cargo activity is outside the scope.

For the maritime sector, we have not developed a 2°C target. The IEA scenario provides only an indication for the emission trajectory of the sector as a whole. However, given the differences between uses (oil tanker, cargo, etc.), it did not make much sense to compare the companies to a global target. So we preferred to apply another method, well established in the market, that only compares companies and portfolios among themselves. This is categorization by Carbon Efficiency Level, developed by Carbon War Room and Rightship. Each vessel is rated from A to G, where A is the best rating. The ranking is dynamically calculated to account for annual improvements in efficiency and variations in the mean, so that "A" ships always represent the top 10% (measured in terms of CO<sub>2</sub> intensity).

If your portfolio is invested in passenger air transportation, the following charts show the carbon intensity, standardized per kilometer for your stocks and bonds. For passenger air transport, the following charts show the carbon intensity, standardized per passenger-kilometre for your share portfolio and bonds. If your portfolio is invested in shipping, the charts show the exposure by Carbon Efficiency Rating (A-G) for portfolios and comparison to the average.



Source: 2ii based on EY 2016, FlightAscend, and Rightship, Carbon War Room

## **SECTION 3: OPTIONS FOR ACTION**

## OVERVIEW

If you decide to implement a climate-related strategy, we can provide you with a list of organizations to help you implement this strategy. This list includes both portfolio analysis providers, including those that provide the model presented here, and alternative approaches that do not specifically follow the 2°C climate goal, as well as organizations that can support engagement with companies. The list does not include companies which offer funds or similar products themselves.

On the following pages, we present some lines of action currently followed by international investors to implement climate strategies in support of the Paris Agreement. Two options are examined in detail (see box below).

### PORTFOLIO MANAGEMENT

Investors can influence the cost and availability of capital through their investment decisions. The logic of this approach is to reduce financing costs and provide capital for green investments and/or reduce the availability of capital for polluting investments. The impact of such strategies obviously depends on the liquidity of the market and the possibility of mobilizing a critical mass of investors implementing a coordinated strategy: a single player selling its oil stocks will have little chance of influencing sustainably exchange rates and therefore the cost of capital for issuers. Less liquid markets or markets where an investor can influence the financing requirements are particularly appropriate for this strategy (for example, smaller listed companies, where investments are less liquid). However, the risks may be higher. In the case of CO<sub>2</sub>-intensive sectors, it is more difficult for investors to develop an actual climate impact through portfolio management strategies, as other investors can compensate the effect (e.g. by buying up shares). However, in order to reduce portfolio transition risks, it may be useful to reduce the share of CO<sub>2</sub>-intensive sectors in the portfolio.

### ENGAGEMENT WITH COMPANIES

As shareholders, financial institutions can influence investment decisions and corporate strategy through the use of their voting rights. Some investors are already involved in engagement actions, for example through the "Aiming for A Initiative" initiative led by the Church of England and other investors (e.g. Trust, Sarasin & Partners Pensions). In order to succeed, these activities must be supported either by the management of the company or by the majority of shareholders. This requires bringing together a significant number of active investors. Service providers can coordinate such strategies. In recent years, investors have actively engaged in investor associations such as UN PRI or IIGCCC. This strategy can be implemented in a complementary manner to portfolio management.

## 2°C SCENARIO ANALYSIS AND IMPLICATIONS FOR RISK

Important in the implementation of different actions based on the 2°C scenario analysis is an understanding of the implications for risk and return of the portfolio. It is important to emphasize here that the results presented in Section 2 are explicitly not a risk analysis. In general, the following findings can be summarized as the interaction between risk, return, and the 2°C scenario analysis.

Although the analysis focuses on alignment with the Paris Agreement in a way that contributes to the general interest, the issue can also be addressed in terms of the financial risk to Swiss pension funds and the insurance companies if the energy transition is not properly anticipated.

For Swiss pension funds and insurance companies, the main risk seems to be more pronounced if the 2°C target is not reached. Aviva and the Economist Intelligence Unit analyzed the net impairment loss for financial assets under management at approximately USD60 trillion in a 2°C scenario (Aviva 2015). The TCFD (Task Force on Climate-related Financial Disclosures) initiated by the Financial Stability Committee (FSB) calls these risks "physical risks". If 2°C objective is reached, these physical risks can be reduced considerably. The cost would be limited to less than USD10 trillion if we remain below 3°C according to the same Aviva / ECIU estimates.

However, investment portfolios can then be exposed to what the TCFD calls "transition risks" - the economic and financial risks associated with the transition to a low-carbon economy. These risks are likely to be particularly pronounced for the most CO<sub>2</sub>-emitting sectors, and thus their investors. Most of these sectors are covered by our analysis in the previous sections.

Although the 2°C scenario presented in this report is not directly a financial risk assessment, it can help to better understand the exposure to transition risk faced by Swiss pension funds and insurance companies. It makes it possible to understand whether the necessary transition will be gradual (when the production and investment plans are aligned with the 2°C scenario) or is likely to be abrupt (sudden correction linked to the introduction of new technologies or constraints legal proceedings leading to bankruptcies of established companies). All investment strategies are exposed to potential risks. The scenario analysis reveals how each strategy evaluated is an explicit or implicit bet on a 2°C, 4°C or 6°C scenario. Depending on the trajectory that will ultimately prevail, the portfolios will underperform or outperform. From the point of view of the optimization of the risk/return ratio in the long term, it is essential to be aware of the bet made.

From a transition risk perspective, the following three questions are important:

- 1) Is my portfolio over-exposed to transition risks by deviating from the 2°C benchmark?
- 2) If this is the case, which securities in my portfolio are exposed to these risks?
- 3) Should these risks arise, what are possible losses?

The answer to the first question is provided by the analysis presented in the previous pages.

There are different approaches to quantifying exposure:

- Based on the method presented in this report, it is possible to isolate the most misaligned sectors and securities with respect to a 2°C trajectory.
- The rating agency Moody's developed in 2016 a methodology to classify the different sectors of their corporate bond universe according to the risk of downgrade due to environmental risk.

A final question to be considered is: what is the potential value at risk for this part of the portfolio if a 2° C scenario materializes? This requires additional financial analysis. In particular, assumptions must be made as to how the market has already (or not) integrated these risks into the current price of financial assets. There are several research papers on the subject, published by financial analysts, NGOs and consultants, covering equities and credit (2ii 2017).

In all this, it is important to emphasize that asset prices - based on market participants' assumptions about changes in the yield-risk profile of securities - do not necessarily reflect the economic risks faced by a company. Thus, the price of assets, and the risk that their valuation will decrease, does not automatically reflect the underlying risks to which the companies are exposed. On the other hand, it should be noted that the return potential is optimized when the allocation of capital is as efficient as possible. If the capital is not allocated efficiently, the absolute benefit is also reduced. Signals issued by the financial markets in the form of portfolio reallocation choices or via shareholder engagement can thus help optimize the allocation of capital in the real economy, and help maximize long-term returns.

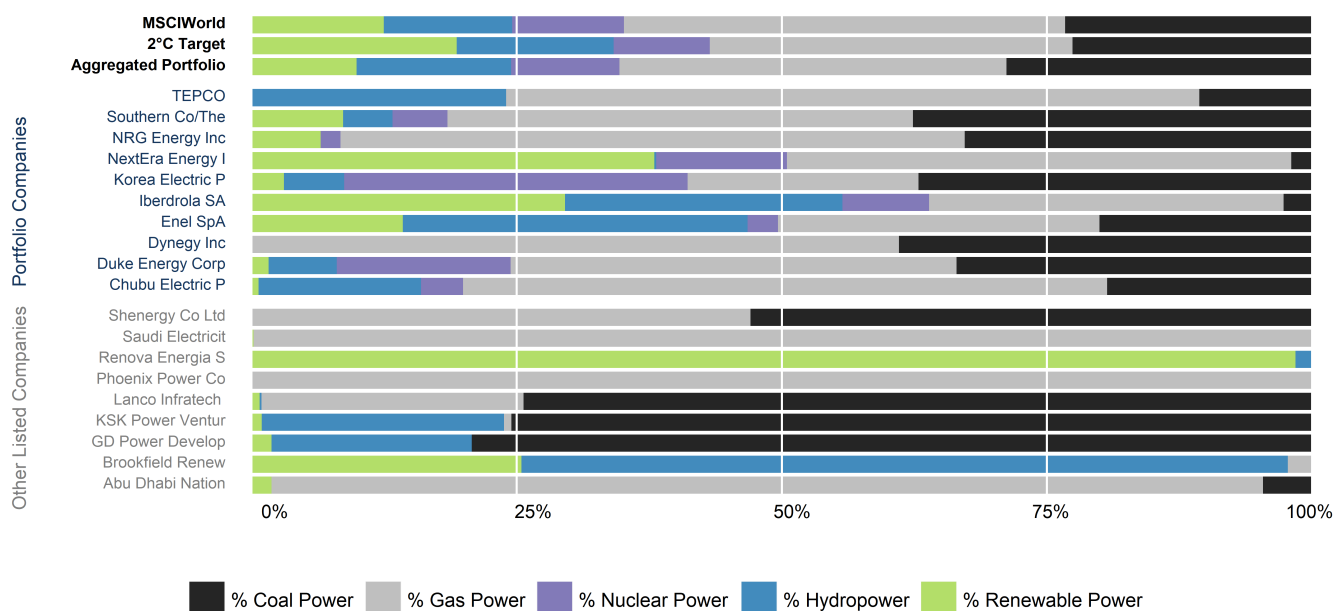
# OPTIONS FOR ACTIVE MANAGEMENT

2° C scenario analysis can feed into and support active investment strategies. In this case, companies may be excluded from portfolios or their securities underweighted if their exposure to technologies, carbon efficiency and/or the evolution of these indicators is not consistent with a 2° C trajectory. Companies that develop new green technologies can also be identified.

For example, many 'green funds' are not broadly diversified and focus only on certain companies identified as sustainable or 2° C compatible. These strategies can, for example, be part of a smaller mandate within a broadly diversified mandate.

The technology mix of the largest companies in your portfolio (measured by the portfolio weight) is shown below. Additional companies in the electricity sector are presented for comparison, but this is not to be interpreted as an investment recommendation.

**Power companies.** The following chart shows the technology mix of companies in your portfolio in 2022, as well as a comparison with other companies outside the portfolio in the MSCI World Universe.

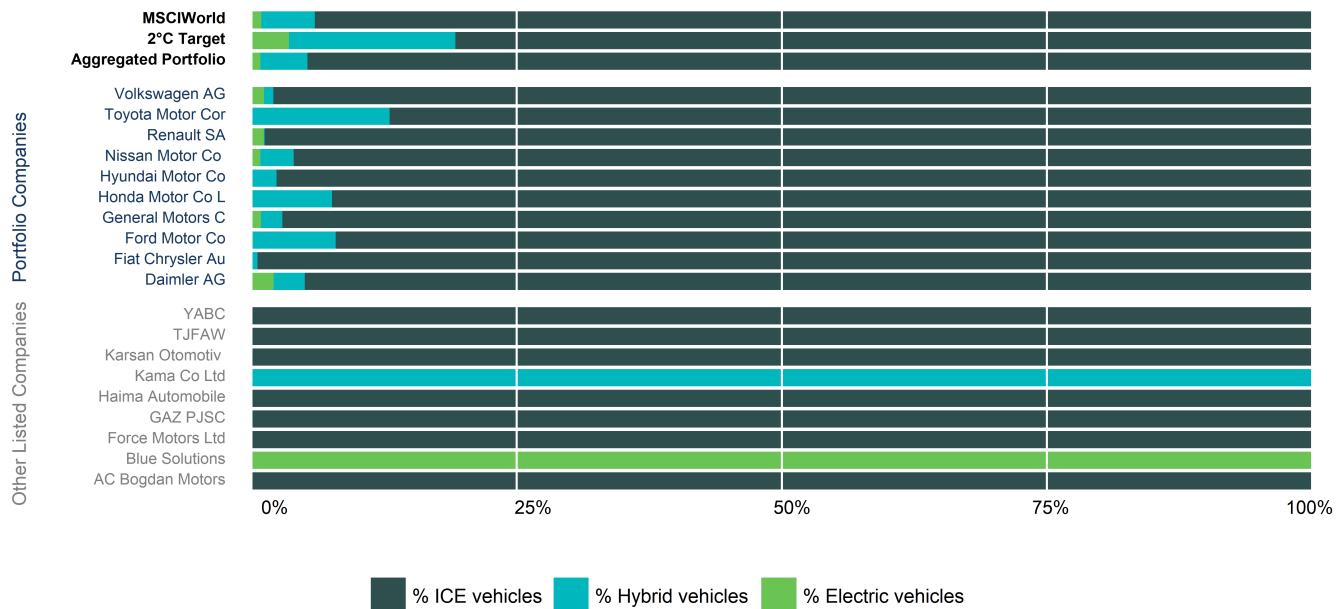


Source: 2ii based on GlobalData, IEA 2016



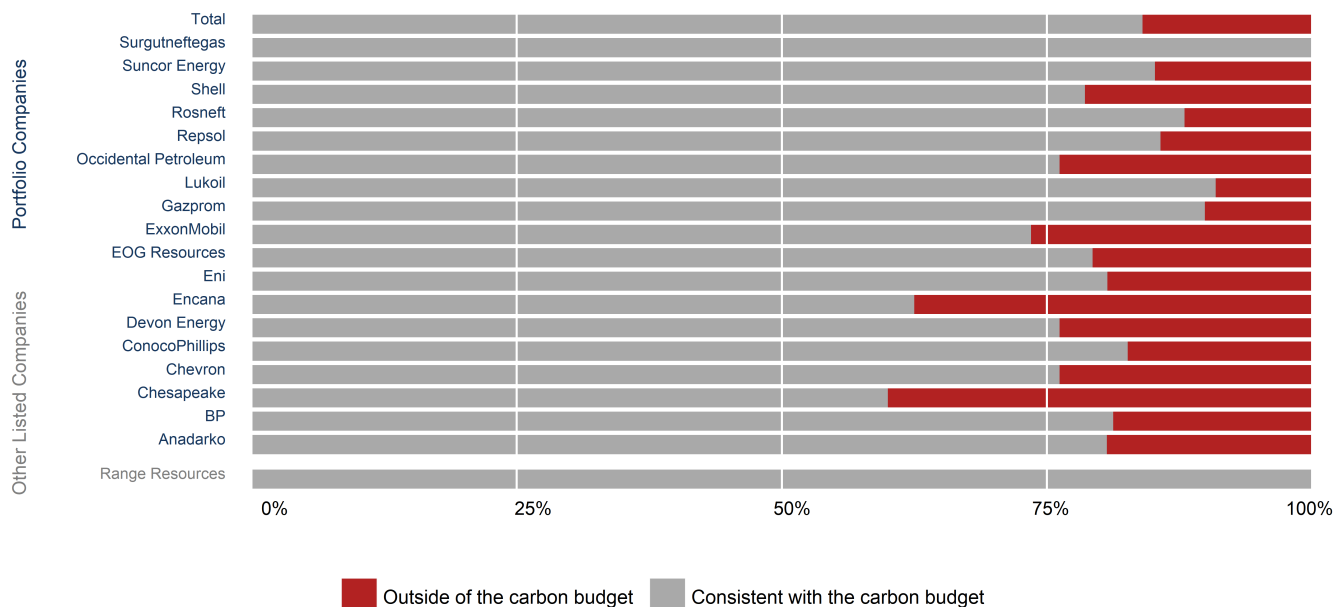
# OPTIONS FOR ACTION & ACTIVE MANAGEMENT

**Automobile companies.** The graph shows the technology mix of the largest automotive manufacturers in 2022. The majority of companies are less exposed to hybrid and electric car production than would be required under the 2°C target. Overall, the market is significantly below the 2°C benchmark.



Source: 2ii based on WardsAuto / AutoForecastSolutions, IEA 2017

**The CO<sub>2</sub> budget of oil and gas companies.** Although it is not possible to directly analyze the technology mix in these sectors, it is still possible to differentiate between companies in the oil and gas sector. An approach pioneered by the Carbon Tracker Initiative and UN PRI takes into account the estimated production costs of oil reserves and investment plans. On this basis, the share of reserves/future production which is outside the 2°C path is determined. This share is the sum of the future oil production that is above the 2°C price limit, where existing reserves are exhausted. The approach thus distributes the future production according to the 'least-cost principle'. The graph below shows the results for the largest oil and gas companies in the portfolio, as well as a selection of other companies in the MSCI World for comparison.



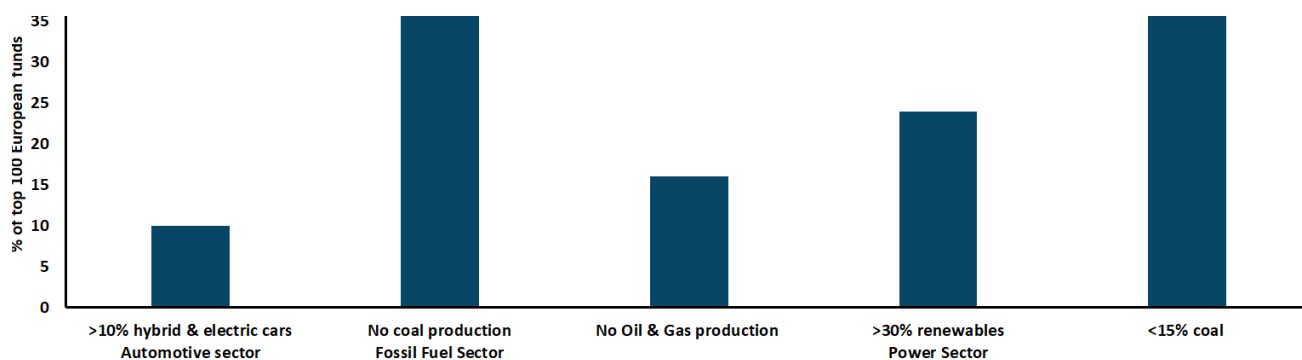
Source: 2ii based on Carbon Tracker Initiative 2017

## OPTIONS FOR ACTION & FUND SELECTION

In addition to direct and active management, portfolio strategies can also be implemented with funds that explicitly pursue a 2°C compatible strategy. There are funds that do not explicitly implement a 2°C compatible strategy, but perform well relative to the 2°C scenario analysis. The following summarizes the main strategies that currently exist in the market, some of which are applied in combination:

- Low-carbon' strategies try to reduce the carbon footprint of the portfolio by either underweighting or directly excluding CO<sub>2</sub>-intensive firms. This affects in particular coal-intensive power suppliers, as well as companies in certain industries, for example cement. However, these strategies take into account only direct emissions (Scope 1) and emissions associated with electricity consumption (Scope 2), rather than emissions generated indirectly in the supply chain or in the product use. Therefore, automotive companies are often not considered. Similarly, when looking at energy companies (coal, oil and gas) the challenge is that the analysis does not consider the emissions of the products (> 90% of the total emissions). Moreover, estimated data are used for the majority of companies in the equity market, given reporting gaps, which can give rise to significant uncertainty around the results. Finally, carbon intensity analysis is frequently based on normalization factors related to market capitalization or revenues, which can create biases. This strategy is employed for example by the French pension fund, ERAFP, and the Swedish pensions fund, AP4.
- Fossil-free' strategies focus on companies with fossil fuel reserves: mainly coal, oil and gas companies. These strategies do not take into account directly energy production or associated emissions. They are often linked to the first strategy and both can, therefore, in combination, offset some of their respective weaknesses. To date, more than 700 investors, with 5 000 billion Swiss francs of assets, have committed themselves to partial or total divestment from fossil fuels. The list includes more than 40 Catholic institutions, the Norwegian State Fund, Allianz, AXA and Aegon.
- Green investment strategies' focus on the alternatives to CO<sub>2</sub>-intensive products. Here, either certain technologies are analyzed, such as renewable energies and electric cars, or 'green' products and services are chosen through a classification system or taxonomy. The challenge here is to mix different 'green' categories (such as green products for the transport and electricity sectors, or other industries). Active strategies involving very concentrated portfolios often have an advantage here thanks to specific expertise in individual companies and more flexibility. This strategy is increasingly mixed with the first two strategies. The main investors adopting this strategy are the Australian Pension Fund Local Government Super, the HSBC Pension Fund, and the Pension Fund of the British Environmental Agency.

A recommendation for specific funds or strategies is not given in the context of this project, but it should be noted that the market is rapidly developing and there are already indications that the product range will continue to grow in the coming years. In addition, some market players such as Climetrics, have begun developing climate ratings related to these fund strategies. The graph below shows the prevalence of different strategies among the 100 largest funds in Europe, based on Morningstar data.



Source: 2ii based on GlobalData, WardsAuto / AutoForecastSolutions, and Morningstar, IEA 2016

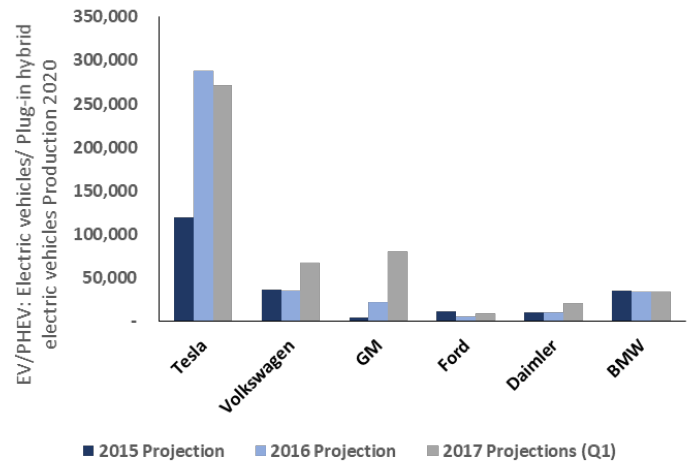
## OPTIONS FOR ACTION – ENGAGEMENT

In addition to the portfolio allocation choices, shareholder engagement with companies is a possible option. This approach aims in particular to influence the company's strategy to become more resilient in a 2°C scenario, maintaining its market share. Based on prospective investment plan data, it is possible to engage in a discussion with the companies in the portfolio. However, it should be noted that the investment plans of the companies can still change significantly - even over the period presented in this analysis.

The graph on the right illustrates the evolution of companies' forecasts for the production of electric and hybrid cars in 2020, based on data from 2015, 2016 and 2017 (data supplied by the data provider, data quality can not be guaranteed by 2Dii or the Swiss government).

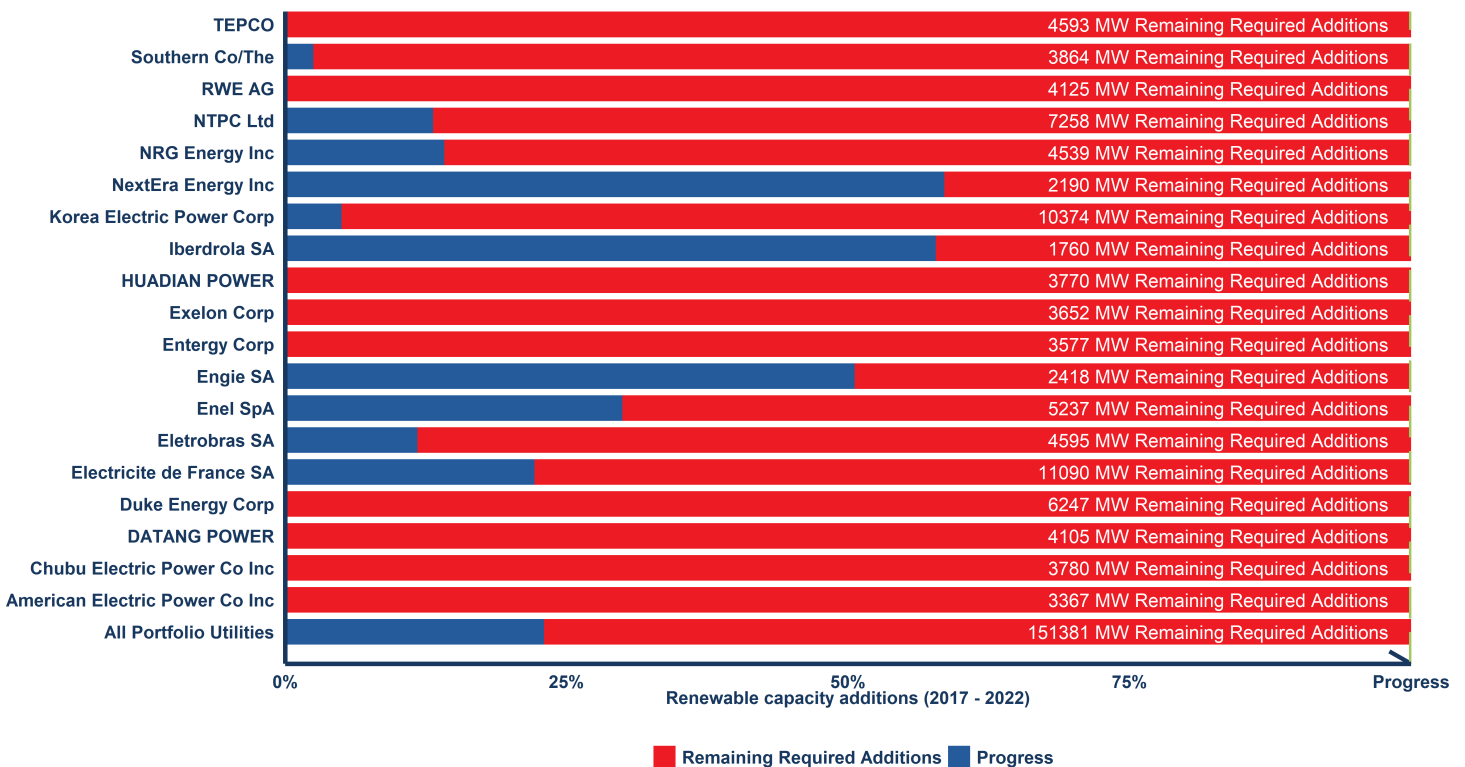
These analyses can then also be compared with the 2°C scenario in order to establish a concrete objective in the discussion with companies. The graph below shows the planned renewable energy investments relative to the 2°C path for the largest companies in your portfolio. Engagement service providers (see Annex) can support actions in this area.

**Production plans change over time, thus engagement can make a significant contribution.**



Source: 2ii based on WardsAuto / AutoForecastSolutions, IEA 2017

**The renewable energy investment and production plans of electricity companies can be compared with the investment volume required in the 2°C scenario.**



Source: 2ii based on GlobalData, IEA 2016

# ANNEX ON DATA SOURCES AND CALCULATION RULES

The data and scenario sources for this analysis are shown below. For more information about the model and the methods of calculation, please visit [www.transitionmonitor.ch](http://www.transitionmonitor.ch).

## Sources for the data and scenario analysis

Automobile data are from July 2017 and is provided by WardsAuto / AutoForecastSolutions. Power data is from July 2017 and is provided by GlobalData. Oil, gas and coal production data is from July 2017 and is provided by GlobalData. When linking asset data with companies, the data is used by the data providers mentioned above and, where possible, enriched with company data from Bloomberg. All financial data, as well as identification numbers for linking company data with financial instruments, come from Bloomberg.

The decarbonization pathways for other sectors comes from the Science-Based Targets Initiative, which base s its methodology on the IEA scenarios. The scenarios for the energy and power sector come from the IEA's World Energy Outlook 2016. Because this report does not include scenario information for the automotive sector, the related data is taken from the sister report of the World Energy Outlook, the Energy Technology Perspective report. Benchmarks for the electricity sector are determined regionally and applied in relation to the regional exposure data and then aggregated, weighted according to the regional exposure of the portfolio. All other results are global.

## Allocation Rules

For the analysis, two different allocation rules have been applied to the equity and corporate portfolios respectively, due to differences in the nature of the portfolios. For equity portfolios, the analysis is based on the ownership percentage of companies and their subsidiaries, with respect to all outstanding shares of the companies. This approach reflects the fact that the shares represent ownership ratios.

In the case of bonds, exposure is determined based on the share in the portfolio of the relevant credit instrument. The underlying company exposure is defined by the technology mix (for example, the ratio of renewable energies to coal). This is why the results of the corporate bond portfolios are not presented in absolute figures.

## Sources:

IPCC (2017) <https://www.ipcc.ch/report/ar5/>

FSB (2017)<https://www.fsb-tcfd.org/publications/final-recommendations-report/>

Aviva / ECIU (2015)<https://www.aviva.com/media/thought-leadership/climate-change-value-risk-investment-and-avivas-strategic-response/>

FSB (2017)<https://www.fsb-tcfd.org/publications/final-recommendations-report/>