



From Bogotá to Paris?

Measuring the climate alignment of Colombian insurance companies' portfolios



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Schönhauser Allee 188, 10119 Berlin

Email: pactacop@2degrees-investing.org

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www.2degrees-investing.org

Co-authors:

Daisy Pacheco (lead author)
Nayra Herrera

Contributing authors:

Antoine Lalechere, Edgi de Los Santos (2° Investing Initiative)
Andrés Jiménez, Robert Woodcock (Fasecolda)

About the 2° Investing Initiative (2DII):

The 2° Investing Initiative (2DII) is an independent, non-profit think tank working to align financial markets and regulations with the Paris Agreement goals. Globally focused with offices in Paris, Berlin, London, and Brussels, 2DII coordinates some of the world's largest research projects on sustainable finance. Its team of finance, climate, and risk experts develop research, tools, and policy insights to help financial institutions and regulators hasten and adapt to the energy transition. To ensure its independence and the intellectual integrity of its work, 2DII has a multi-stakeholder governance and funding structure, with representatives from a diverse array of financial institutions, governments, and NGOs.

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Executive Summary

This report sheds light on the financial exposure of insurance companies in Colombia to climate-related risks and assesses the compatibility of their investment portfolios with climate scenarios. For this, 2° Investing Initiative (2DII) used the Paris Agreement Capital Transition Assessment (PACTA) methodology, a climate scenario analysis methodology that estimates the (mis-)alignment of the portfolios with different decarbonization pathways.

This is the second time that we have done a PACTA assessment of Colombian insurance companies' climate transition risks and the first time that we applied a stress testing methodology. The implementation of both methodologies on the investment portfolios of insurance companies in Colombia contributes to the efforts of these institutions to integrate climate considerations into their decision-making strategies. The results presented here should be carefully interpreted, given the local context and specificities of the insurance sector, and call for continuous monitoring of the exposure to climate risks over time.

The study focused on the investment portfolios of 20 insurance companies in Colombia that participated voluntarily in this analysis (worth about USD 8.7 billion as of 31 December 2020). The analysis focused on two types of assets: the listed equity investments, which correspond to 1.3% or USD 111.3 million of the total portfolio, and the corporate bond investments, which represent 27.6% or USD 2.4 billion. Altogether, these account for almost 30% of the insurance companies' total investments.

PACTA covers seven climate-relevant sectors that account for roughly 70-80% of the indirect emissions in capital markets. These sectors are oil and gas, coal, power, automotive, cement, aviation, and steel. They cover approximately 10.7% (USD 11.9 million) of the listed equity and 32.4% (USD 783.2 million) of the corporate bond portfolio of insurance companies, representing around 9.1% of the total investment portfolio.

The findings show that Colombian insurance companies' exposure to transition risks is mainly concentrated in power, oil and gas, and cement. The corporate bond portfolio has a higher exposure to fossil fuels and power companies than the equity portfolio and the benchmarks used for comparison. However, the fixed income investments might be less exposed to transition risks, given their relatively high exposure to low-carbon technologies, such as hydropower.

When considering the five-year forward-looking production plans of investee companies within the analyzed portfolios, we found that investments in the main sectors are not fully aligned with a <2°C scenario. Despite the low share of coal mining exposure in both portfolios, the production trajectories of companies within this activity are not following the requirements of a Sustainable Development Scenario (SDS, which is consistent with an average global temperature rise in 2100 of <2°C). Oil and gas companies are, in contrast, following a downward trend in their production plans, making the trajectory of production for these two fossil fuels aligned with a <2°C. As for the power sector, high-carbon technologies, i.e., coal, gas and oil power, are not following an SDS scenario and are, therefore mis-aligned. The results for low-carbon technologies show that the buildout of renewable power capacity is not sufficient to be aligned with a <2°C, while hydropower capacity is the only technology in the power sector that is aligned with a <2°C. The following tables summarize these findings, showing the corresponding size of the analyzed equity and corporate bond portfolios in each sector:

Overview of the climate alignment of different sectors and technologies

	Fossil fuels		
	Coal	Gas	Oil
Listed Equity (USD 3.6 m)	> 3.2°C	<2°C	<2°C
Corporate Bonds (USD 191.6 m)	> 3.2°C	<2°C	<2°C

	Power				
	Coal capacity	Gas capacity	Oil capacity	Renewable capacity	Hydropower capacity
Listed Equity (USD 3.4 m)	2.7°C – 3.2°C	> 3.2°C	> 3.2°C	> 3.2°C	<2°C
Corporate Bonds (USD 400.7 m)	2.7°C – 3.2°C	2.7°C – 3.2°C	> 3.2°C	2.7°C – 3.2°C	<2°C

For sectors where no clear technology decarbonization pathways have been set out (specifically for cement, which is the third most represented sector in the investment portfolios analyzed), the analysis finds that issuers in the portfolios should decrease their emissions intensity for the investment portfolios of insurance companies to be aligned with a <1.75°C scenario.

In addition to the PACTA analysis, we applied a climate stress testing methodology to quantify the resilience of the portfolios under a hypothetical unfavorable climate scenario, known as a “late and sudden” scenario. The stress test covers three out of the seven PACTA sectors, namely upstream fossil fuels, power generation and automotive production. These sectors account for 61.7% and 75.7% of the PACTA-covered listed equity and corporate bond investments and 6.9% of the total portfolio. The results at aggregate level show that, in the case of materialization of a late and sudden transition, the total net value loss in the listed equity portfolio would correspond to USD 1.3 million or 1.2% of the portfolio. In the case of the corporate bond portfolio, the net value loss would be USD 1.5 million or 0.06% of the portfolio.

At the technology level, the stress test results show that the net value loss for both portfolios would be mainly driven by the fossil fuel technologies, especially by investments in oil production companies. The share of renewable and hydro power capacity would outweigh these losses, contributing positively to the aggregated results. Despite the low proportion of the automotive sector in the insurers’ portfolios, this sector contributes negatively to the results of both portfolios.

Introduction

According to the 17th edition of the Global Risk Perception Survey (GRPS) conducted by the World Economic Forum (WEF), the climate crisis remains the world's most significant long-term threat to humanity¹. Unless we coordinate a global transition to low carbon economies, we will experience irreversible consequences and economic losses.

The 2021 United Nations Climate Change Conference (COP26) made essential steps towards a global commitment to ensure the transition. Governments and global leaders from more than 150 countries around the world put forward new 2030 emission targets (mainly through the publication of their Nationally determined contributions, NDCs) and agreed to further strengthen their commitments for 2022. However, according to projections made by the Climate Action Tracker, full implementation of 2030 NDC targets puts the world on a track for a 2.4°C temperature rise by the end of the century², far above the Paris Agreement goal to limit global temperature rise to less than 2°C above preindustrial levels.

Within this context, not only governments, but also business, investors, and communities have become increasingly conscious of the need for a faster transition. Growing awareness from the financial and the private sector have contributed to pledges and announcements such as the one made in COP26, when the Glasgow Financial Alliance for Net Zero (GFANZ) announced that more than US\$130 trillion in private capital investments would be committed to achieve carbon neutrality³. The GFANZ quickly became a reference for financial institutions to align their commitments and turn them into actions to deliver the investments needed to achieve net zero. Among the key activities to succeed in this endeavor, the Alliance highlights the need to design and implement credible net-zero transition plans, based on the assessment of financial institutions' portfolios and their alignment with different decarbonization pathways – giving the financial system a fundamental role in the transition.

The requirement to make finance flows consistent with a pathway towards low greenhouse gas emissions is set out in Article 2.1.(c) of the Paris Agreement⁴, which is consolidated already in frameworks such as the GFANZ, and other financial sector initiatives to align financial flows with climate goals. The assessment of progress towards this end requires financial institutions to measure and publicly disclose the level of alignment of their portfolios with the goals of the Paris Agreement, and at the same time, to incorporate forward-looking metrics in their internal management processes⁵. The Portfolio Alignment Team, a collaborative initiative framework backed by the Taskforce for Climate-related Financial Disclosures (TCFD), refers to these models as portfolio alignment tools. This report presents the main findings of the implementation of one portfolio alignment methodology, the PACTA (Paris Agreement Capital Transition Assessment) tool, on the investment portfolios of insurance companies in Colombia. It is complemented by a stress testing methodology that looks at the long-term risk exposure (next 20 years) in case of a “late & sudden” transition (i.e., a transition in which limited climate action is taken for several years, followed by ambitious action to limit the earth's warming).

PACTA is a scenario analysis methodology that looks at the short-term (mis-)alignment of investment and corporate lending portfolios with <2°C scenarios and the related potential exposure of financial institutions in the case of a disruptive transition. The methodology was developed by 2 Degrees Investing Initiative (2DII) and has been used by over 4,000 financial institutions around the world. The users have applied

¹ <https://www.weforum.org/reports/global-risks-report-2022>

² <https://climateactiontracker.org/publications/glasgows-2030-credibility-gap-net-zeros-lip-service-to-climate-action/>

³ <https://www.gfanzero.com/about/>

⁴ https://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english_.pdf

⁵ https://www.tcfddhub.org/wp-content/uploads/2021/10/PAT_Measuring_Portfolio_Alignment_Technical_Considerations.pdf

PACTA either through its dedicated online tool⁶, working groups⁷, or through 2DII's dedicated program PACTA COP (Coordinated Projects), in which 2DII collaborates with governments and supervisors, on an individual or collective basis, to help them apply PACTA to the portfolios of their regulated entities. Already, 2DII has helped to run the assessments in Switzerland, Liechtenstein, Norway, Luxembourg, and Austria. Additional governments and supervisors in emerging markets, including Brazil and Peru, are set to do the same over the course of 2022. The uptake of the PACTA tool shows a growing recognition around the idea that the mobilization of resources to enable the transition to net-zero should happen in every country, including both developed and developing economies.

This report uses PACTA to analyze the climate compatibility of Colombian insurance companies and aligns with the efforts by the Colombian financial sector, supervisor, and government to transition to a low carbon economy. In the last decade, Colombia has developed a series of policy instruments to address climate change and help achieve their Paris Agreement commitments, such as the Colombian Strategy for Low Carbon Development (ECDBC)⁸, the National Plan for Adaptation to Climate Change (PNACC), and the National Strategy for the Reduction of Emissions from Deforestation and Forest Degradation (ENREDD+), which were articulated in 2017 in a more comprehensive policy, the National Climate Change Policy (PNCC)⁹. The Climate Change Law, and the 2050 Strategy (E2050)¹⁰ complement the previously mentioned policies, and guide national, sectoral, and local actors to build a more resilient pathway towards decarbonization.

Likewise, the Colombian financial supervisor has made efforts to help financial institutions to adapt to international best practices, mainly through strategies to promote awareness on the opportunities offered by a low carbon economy and to support the identification and management of ESG (Environmental, Social, and Governance) and climate risks in the financial system. In this realm, in 2019 the Financial Superintendence of Colombia (SFC) stated its objective to focus on four key areas in its climate change action plan: taxonomy; ESG integration; transparency on climate risks; and capacity building.

All of these efforts highlight the importance of identifying and measuring climate related risks to achieve successful climate mitigation. As a result, the goal of this report is to examine the extent to which Colombian insurance companies' investments are compatible with climate scenarios that aim to limit the global temperature rise to below 2°C, and to measure financial losses associated with a late and sudden scenario.

The report is structured as follows: Chapter 2 explains the PACTA and stress testing methodologies, as well as the types of data used in the analysis. Chapter 3 presents the results of the scenario analysis implemented in the listed equity and corporate bond portfolios of insurance companies, and chapter 4 presents the results of the stress test analysis. Chapter 5 concludes.

Background of the study

This study is part of the project *Preparing the public and financial sector for Climate transition risk: Capacity building and call to action*, financed by UK PACT Colombia and led by Universidad de Los Andes in consortium with the Willis Tower Watson (WTW) and 2 Degrees Investing Initiative (2DII).

This is the second time that we have done a PACTA assessment of Colombian insurance companies' climate transition risks and the first time that we applied a stress testing methodology. In 2019, 2DII partnered with Fasesolda (the Colombian Insurance Companies Association) to conduct a scenario analysis of

⁶ <https://platform.transitionmonitor.com/>

⁷ <https://2degrees-investing.org/17-international-banks-now-piloting-the-2-investing-initiatives-flagship-climate-scenario-analysis-methodology/>

⁸ <https://www.minambiente.gov.co/cambio-climatico-y-gestion-del-riesgo/estrategia-colombiana-de-desarrollo-bajo-en-carbono-ecdbc/>

⁹ <https://archivo.minambiente.gov.co/index.php/politica-nacional-de-cambio-climatico>

¹⁰ <https://archivo.minambiente.gov.co/index.php/cambio-climatico/e2050>

insurance sector investment portfolios¹¹. This was the first exercise of its kind carried out in Latin America and the second in the world with an industry association. The pioneer study consolidated Fasescolda's commitment to help the insurance industry to enact more sustainable business models, and complemented the Association's related activities, such as the Sustainability School.

As with the first study, Fasescolda has supported this project from the beginning and played a key role in raising awareness within the sector of the importance of participating in this type of analysis. In this sense, the analysis presented in this report consolidates the results of the application of the PACTA methodology in the portfolios of a group of insurance companies that voluntarily decided to participate and submitted their portfolios in the Transition Monitor Platform. In addition to this report, each participant received a report containing their individual results of the scenario analysis.

¹¹ For more information on the previous study, see <https://2degrees-investing.org/resource/fasescolda-pacta-scenario-analysis/>

Methodologies and data sources

PACTA climate scenario analysis

The Paris Agreement Capital Transition Assessment (PACTA) is a free and open-source methodology and software tool developed by the 2 Degrees Investing Initiative (2DII) to assess the alignment of investor (listed equity and corporate bonds) and bank (corporate lending) portfolios with climate goals, across a set of key climate critical sectors and technologies. The selection of asset classes covered by the methodology responds to the key role corporate issuers have in the transition to the low-carbon economy and the flexibility investors have to carry out different actions that allow mitigation of portfolio level climate-related risks and risks in the real economy.

At its core, PACTA compares what needs to happen in sectoral decarbonization pathways, here within referred to as “climate scenarios”, with financial actors’ exposures to companies in climate-relevant sectors. PACTA provides a five-year forward-looking, bottom-up analysis. It looks at the investment and production plans of companies, which are in turn based on physical asset-based company level data and consolidates that information to identify the energy transition profile of the companies and their related financial instruments. This information is aggregated at the portfolio level and compared to the production plans projected in different climate scenarios. The (mis-) alignment between the portfolio and these scenarios allows users to infer on the potential exposure to transition risks and opportunities. Further details on the accounting principles behind the methodology are provided in Box 1 and 2.

The PACTA methodology covers seven of the most carbon-intensive sectors in the economy (i.e., the sectors most exposed to transition risks) – oil and gas, coal, power, automotive, cement, aviation, and steel (the "PACTA sectors"). Together, they are responsible for over 75% of all CO₂ emissions¹². In each sector, PACTA focuses on the part of their value chain with the highest contribution in terms of CO₂ emissions. For example, in the oil and gas sector, the focus is on upstream activities related to production, while in the power sector, the focus is on power generation and related sources of energy. For more information regarding the segments of the value chain covered by PACTA see Annex.

The PACTA climate scenario analysis provides answers to the following three questions:

1. What is the current exposure of the portfolio to the economic activities that are most affected by the transition to a low carbon economy?
2. How aligned are the investment and production plans of companies in the portfolio with different climate scenarios and the Paris Agreement?
3. How the exposure of the portfolio will change in the next five years, and how does it compare to a portfolio that is aligned with the Paris Agreement?

The information provided by the PACTA analysis can be used by investors for transition risk management, for the identification of engagement opportunities with companies, for disclosure and reporting, and for strategy setting and decision making.

¹² This is a high-level estimate done by 2DII based on the World Resources Institute’s greenhouse gas emissions data.

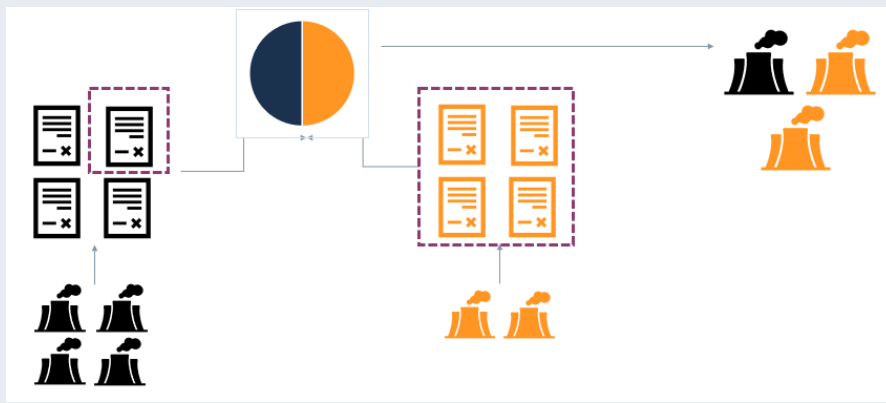
Box 1. Mapping company-level activities to financial instruments and portfolios

Ownership vs Portfolio Approach

A key question addressed in the PACTA methodology is how to allocate company-level activities to financial instruments. Different approaches exist that of which two are used in this analysis:

Ownership weight approach. This approach assigns a share of the companies' activities to the portfolio based on the percent of outstanding shares owned by the investor. As the owner of a proportion of the company, he has control over that same proportion in decision-making. This approach is used for equity portfolios.

As an example, assume there are two companies that compose a portfolio, each one of them issued four shares, and the portfolio is owner of one share of the blue company and the four shares of the yellow company. Under the ownership approach, 25% of the production of the assets owned by the blue company (1 power station) and 100% of the assets owned by the yellow company (2 power station) will be attributed to the portfolio.



Portfolio weight approach. This approach calculates the portfolios' technology exposures based on the weighting of each position within the portfolio. This approach is used for the analysis of corporate bond portfolios.

The result of the previous example under the portfolio approach would be as follows: If the same portfolio is composed of two companies equally weighted, half of the production of the assets owned by the blue company and half of the production owned by the yellow company will be attributed to the portfolio. Thus, two power stations from the blue company, and one power station from the yellow company will be attributed to the portfolio.



Box 2. Allocating macroeconomic goals (scenarios) to microeconomic actors (companies)

The PACTA analysis uses two approaches/principles to allocate macroeconomic climate goals to companies:

Market-share approach. It applies to sectors in which there is technological change. Decarbonization efforts (in magnitude) are allocated to companies based on their current market-share in the sector for low-carbon technologies, and their current market-share in the technology for high-carbon technologies.

Sectoral decarbonization approach, developed by the Science-based Targets Initiative¹³. It applies to sectors in which no low-carbon technologies exist. It is a convergence approach, where all the portfolio's emission intensity targets will converge to match the sector's intensity target at the end date prescribed by the scenario.

PACTA Metrics

The PACTA analysis measures alignment using three different metrics: Technology Share Mix, Production Volume Trajectory and Emission Intensities. The technology mix and the volume trajectory are used for the power, fossil fuels, and automotive sectors, for which there exist clearly identified technology decarbonization pathways. For example, in the power sector there are technologies to which the transition can be made, i.e., coal fired power generation can shift to renewable energies. For other sectors, where technology decarbonization pathways are not so well defined, such as steel, cement, and aviation, PACTA uses an emission intensity metric. Each of these three metrics are explained below:

Technology share mix

The technology share mix metric represents the weight of each technology in the sector as a percentage of investment therein. The portfolio's technology mix is compared to the scenario and a market benchmark (see Figure 0.1 as an example).

The technology share mix metric focuses on technology shifts within the power, fossil fuels, and automotive sectors, namely: (i) the changes in the technological processes by which outputs are produced (e.g., shift from coal-fueled to renewable-fueled power capacity), and (ii) changes in the nature of the output itself (e.g., shift from internal combustion engines to electric vehicles). This metric measures the portfolio's relative exposure to the economic activities that are impacted by the transition to a low-carbon economy. It is a function of how diversified the investments' portfolios are across the companies they invest in and how diversified these companies' activities are across technologies or output types.

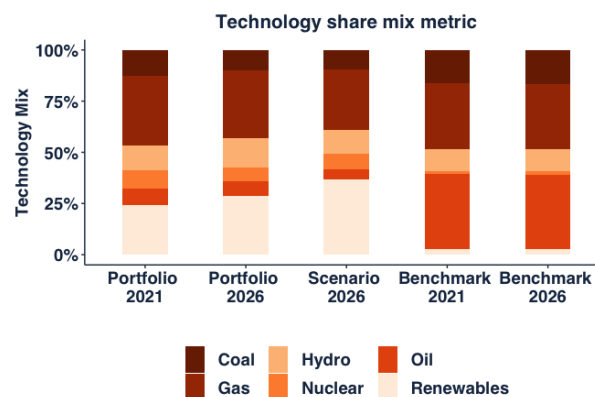


Figure 0.1: Example of the technology share mix metric.

¹³ <https://sciencebasedtargets.org/>

Figure 0.1 shows the high and low carbon technology mix for the power sector in a sample portfolio:

- Portfolio 2021: reflects the current technology mix of the power sector in the analyzed portfolio.
- Portfolio 2026: reflects the future technology mix of the power sector in the analyzed portfolio.
- Scenario 2026: shows the projected technology mix of the portfolio in 2026 based on the SDS scenario.
- Benchmark 2021: reflects the current technology mix of the power sector based on the current production plans of companies comprised at a market index benchmark.
- Benchmark 2026: reflects the future technology mix of the power sector based on the capital plans for the next five years of companies at a market index benchmark.

PACTA assumes a static balance sheet. As such, the difference in the technology mix between Portfolio 2021 and Portfolio 2026 is solely a result of the production plans of the companies the investor is currently financing and not a result of any change in the portfolio composition.

Production Volume Trajectory

The production volume trajectory metric aims to measure the forward-looking alignment of a portfolio's projected production volumes, based on the five-year capital plans of companies, to the production volume ranges set as targets in different climate scenarios.

Changes in production volume result either from the transfer of production from one technology to another (e.g., internal combustion engines to electric vehicles) or from the sheer expansion or contraction in production coming from the technology/fuel (e.g., a company brings a new coal-fired power plant online). Figure 0.2 shows an example of the production volume trajectory metric for internal combustion engine (ICE) vehicles.

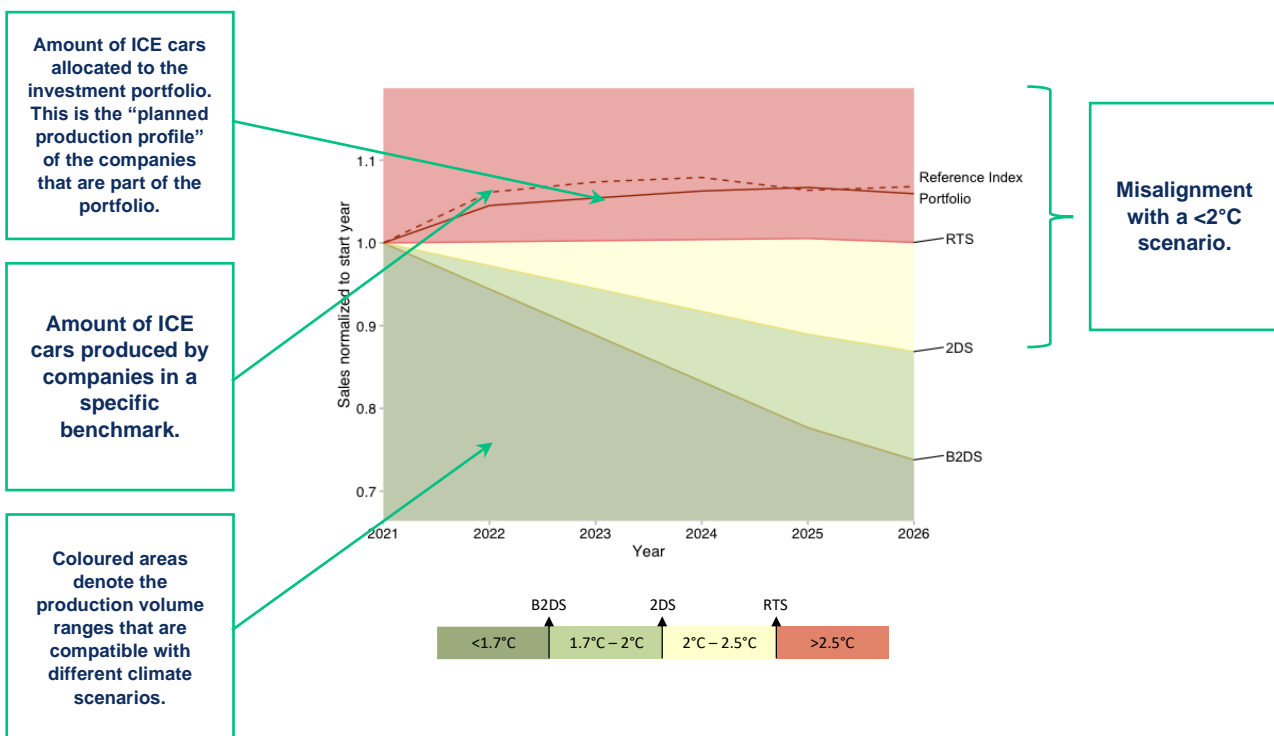


Figure 0.2: Example of the production volume trajectory metric for ICE vehicles.

The Y-axis of Figure 0.2 shows the normalized production, in this case sales planned for the next five years with the current capacity represented as 1. The chart shows that the portfolios' ICE vehicles' production trajectory falls within the red area and increases between 2020 and 2026. This means that the portfolio companies'

production plans for ICE vehicles for the next five years are not compatible with the Beyond 2 Degrees Scenario (B2DS) and perform worse than the 2 Degrees Scenario (2DS) and the (Reference Technology Scenario (RTS), but similar to the selected benchmark.

Box 3. Interpreting the technology share mix metric and the production volume trajectory metric altogether

The technology mix metric and the production volume trajectory metric both provide an indication of the alignment of portfolio companies with the Paris Agreement goals. However, they differ in that the technology mix metric is a measure of the relative amounts invested in different climate relevant technologies within the portfolio, while the production volume trajectory measures whether the rate of change in the production amount is sufficient to meet the benchmark scenario that is in line with Paris Agreement goals. For example, it is possible that renewable power generation makes up a large portion of a credit portfolio relative to carbon intensive power generation, resulting in a portfolio that is aligned with the Sustainable Development Scenario (Paris Agreement aligned) from a technology mix perspective. Yet the rate of increase of renewable power generation may be too small to meet the same scenario from a production volume trajectory perspective, because companies in the portfolio might not be planning an increase in their production plans in the next five years.

Emission intensity metric

The emission intensity metric measures the average CO₂ intensity of the portfolio in the steel, cement, and aviation sectors. This emission intensity is given as CO₂/economic unit of output (for example, CO₂/per ton of steel produced). This is then compared to an emission intensity reference point set by a climate scenario.

While this is not the main metric of choice for the largest sectors tackled in this methodology, the emission intensity of the activities financed by the portfolio is nonetheless the first metric in sectors for which no clear technology pathways have been set out (namely, steel, cement, and aviation). Put differently, for these sectors no zero-carbon alternative yet exists. As such, it is not possible to use the technology mix metric or the volume production volume trajectory metric to measure alignment. However, it is still imperative to steer capital in a way that aims to decrease carbon emissions in these sectors – hence the emission intensity metric is used.

Stress testing methodology

The stress testing exercise estimates the size and percentage of the financial loss a portfolio may experience within a given time horizon in response to the materialization of a hypothetical unfavorable “late and sudden” scenario, in which delayed policy action is followed by ambitious policy that enables greenhouse gas (GHG) emissions reduction in levels consistent with the Paris Agreement goals. The value loss of equity and bonds is calculated by comparing two transition scenarios:

- An orderly transition following the Sustainable Development Scenario (SDS) developed by IEA. This scenario remains below a 2°C temperature rise, thus is in line with the Paris Agreement.
- A disorderly transition that assumes stated policies will be implemented (i.e., based on the IEA Stated Policy Scenario – SPS) until a certain point time, period after which governments take sudden and drastic measures to remain in line with Paris Agreement goals.

Due to the policy change triggered by sudden transition, high carbon sectors' production will decrease quickly and significantly, while production in less carbon-intensive sectors will increase sharply. Figure 0.3 shows an example of the trajectory of coal power capacity under the different scenarios considered in the stress testing exercise. The methodology assumes a baseline scenario in which the portfolio follows the technology buildout rate of the SPS scenario. This assumes that companies in the portfolio are not factoring transition risks in their

strategy in a significant way, and that the main driver in their decision making is the policy that has been announced and the changes in low-carbon technology costs that can already be estimated. During the first five years, the trajectory follows the SPS scenario, but at a certain point in time, in which the sudden transition will occur, the trajectory needs to adjust and will follow a late and sudden transition pathway. The magnitude of the shock needs to ensure that overall production stays within the limit of the target scenario (SDS), thus compensating the production overshoot of Area A1 with a stricter reduction of production compared to the SDS line (Area A2).

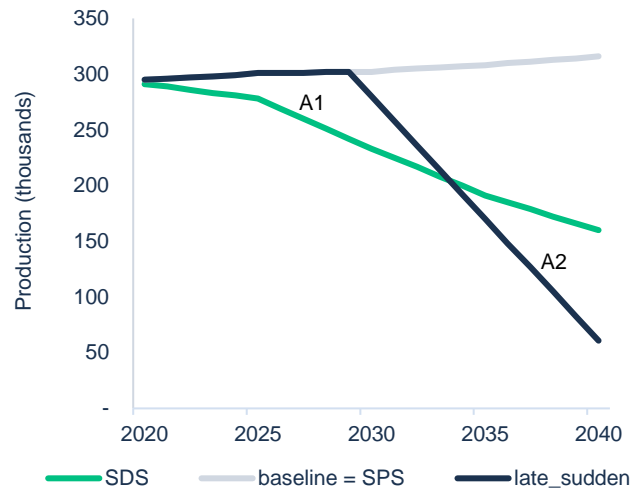


Figure 0.3: Trajectory of a high carbon technology under different scenarios.

These dynamics will change market prices in the sectors under analysis, as well as profits. These changes are quantified as potential losses (or gains) in the value of listed equity and corporate bond holdings. Using a discounted cash flow model, the change on the profits of companies is quantified for both scenarios (SDS and SPS) and compared. The profits can change for four reasons: i) change in production or in price due to different demand; ii) additional depreciation cost due to a shorter lifespan of high carbon assets and R&D expenditures increase due to deployment of new technologies necessary to meet unanticipated demand; iii) change in production inputs price; and iv) new tax for high carbon intensive industry. The model assumes that dividends and net profits for a given year are linearly dependent (Gordon, 1959)¹⁴. A shock to profits will be linearly translated to a shock to the equity value of a holding. For bonds, the impact on corporate bonds is assumed to be equal to 0.15 times the impact on equities, as introduced by the Bank of England Prudential Regulation Authority¹⁵.

The stress testing model focuses on three key climate-critical sectors: fossil fuels, power, and automotive. As in the case of PACTA, it focuses on the part of the segment of the value chain with the highest impact in terms of CO2 emissions.

The stress testing exercise provides answers to the two following questions:

1. What are the potential financial losses under certain climate scenarios?
2. How are these potential financial losses distributed across different technologies and sectors?

¹⁴ <http://piketty.pse.ens.fr/files/Gordon1959.pdf>

¹⁵ <https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/letter/2019/general-insurance-stress-test-2019-scenario-specification-guidelines-and-instructions-draft.pdf?la=en&hash=0606B563F9BE671D9E8C73C72D7214A497E1F4EE>

Data sources

Portfolio Data

To run the portfolio assessment, participants provide an input file containing security information for each portfolio to be analyzed. It includes the following information:

- One ISIN for every listed instrument (funds are identified by their ISIN. Securities in each fund are included in the analysis)
- The market value of the financial assets held in the portfolio
- The currency code corresponding to the market value
- A time stamp of the portfolio

Financial data

Data from financial databases and Lipper is used to assign securities to sectors and link them to parent and subsidiary companies.

Physical Asset-Based Company Level Data

For each sector covered in the analysis, 2DII sources data from Asset Resolution. In turn, Asset Resolution sources its data from independent industry data providers that obtain data on individual assets in climate-relevant industries using a variety of research capabilities, including web scraping, desk research, and direct engagement with industry. The asset-based company level data covers more than 280,000 individual assets (e.g., individual power plants, oil fields etc.) that account for more than 75% of global carbon emissions.

Figure 0.4 shows the coverage of asset-level data relative to estimated global production figures—the global benchmark—for the power, oil & gas, coal, and automotive sectors. The figure highlights the share of assets that have been mapped to financial data and are thus included in the analysis.

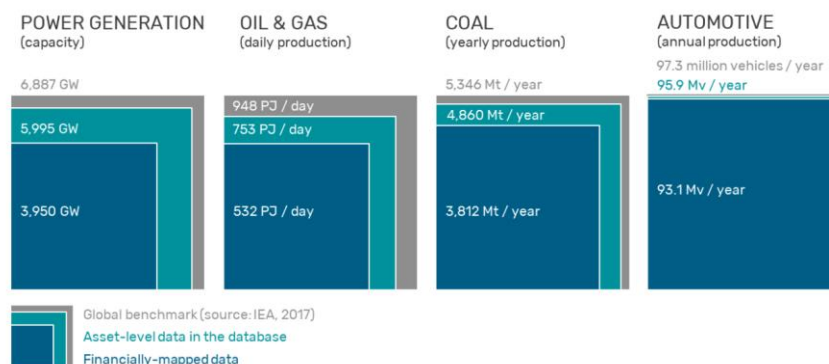


Figure 0.4: Coverage of the data sources in different sectors. Source: Asset Resolution.

Scenario Data

Measuring alignment requires scenarios that explain what needs to happen in a sector to decarbonize. While climate change scenarios do not predict the future, they provide essential information to understand climate change, and the pathways to reach certain goals. In the efforts to tackle climate change it is critical to understand what can happen, and what should happen in the future that although is uncertain is not unknowable. It is important to note that climate scenarios are built under different assumptions, and therefore can propose different courses of action to achieve climate targets. The table below shows an overview of the scenarios used in this report and for which sector they are used. Further details on climate scenarios are provided in Box 4.

Table 0.1: Overview of scenarios used in this report

Scenario	Sectors used	Implied Temperature Rise in 2100	Probability	Publication	Abbreviation
Sustainable Development Scenario	Oil and gas, Power	1.8°C	66%	IEA, WEO 2020	SDS
Stated Policy Scenario	Oil and gas, Power	2.7°C	50%	IEA, WEO 2020	SPS
Current Policy Scenario	Oil and gas, Power	3.2°C	50%	IEA, WEO 2019	CPS
Beyond 2 Degrees Scenario	Automotive, Steel, Cement, Aviation	1.7°C	50%	IEA, ETP 2017	B2DS
2 Degrees Scenario	Automotive	2°C	50%	IEA, ETP 2017	2DS
Reference Technology Scenario	Automotive	2.5°C	50%	IEA, ETP 2017	RTS

Box 4. Climate Scenarios

Stabilizing the global mean temperature increase to 2°C with some probability requires total anthropogenic CO₂ emissions to stay within a certain budget, estimated at around 1000 Gt CO₂ by the Intergovernmental Panel on Climate Change (IPCC). Emissions will have to reach net zero by 2070, meaning that by that time, all remaining emissions will have to be compensated by removing CO₂ from the atmosphere. Achieving this goal requires profound shifts in our economy and energy system in particular.

A climate scenario is the result of a modeling exercise that aims to illustrate pathways for achieving this profound transition of the energy system under a certain set of assumptions. It is not a forecast or prediction of the future. Every climate scenario relies on a set of assumptions regarding future technological and socio-economic development.

Two main categories of models are used to study possible low-carbon transition scenarios: Energy System Models that provide a detailed study of the energy system and the development of different technologies, and Integrated Assessment Models that integrate models of the climate, economic, land-use, and energy system and therefore are able to capture interactions between these systems.

Alignment with specific temperature targets: Each climate scenario operates within the constraints of a global carbon budget that then corresponds to a global mean temperature increase, with a certain probability. This carbon budget can be allocated to different sectors and technologies in different ways, based on the assumptions of the model. Alignment or non-alignment in one technology therefore does not imply alignment overall, as there are different ways of distributing the carbon budget across different sectors.

Results of the climate scenario analysis

This section presents the key findings of the application of the PACTA methodology to the investment portfolios of 20 insurance companies in Colombia. These companies volunteered to take part in the study as part of the project *Preparing the public and financial sector for Climate transition risk: Capacity building and call to action*, financed by UK PACT and led by Universidad de Los Andes in consortium with the Climate Policy Initiative (CPI) and 2DII. This work is also part of PACTA Coordinated Projects, a dedicated program in which 2DII works with governments, supervisors, and industry associations to assess national financial sector alignment with climate goals.

The results presented in this section are compared to the “Global Market”. The global market consists of a global universe of financial assets that could be linked to the asset-based company data. It is a snapshot of current production plans that could be mapped worldwide using data provided by Asset Resolution. Likewise, for some of the results, a comparison with two market index benchmarks is also included: the equity portfolio is compared to the *iShares MSCI EM UCITS ETF USD (Dist)*¹⁶, which reflects the performance of the MSCI Emerging Markets Index, while the corporate bond portfolio is compared to the *iShares Global Corp Bond UCITS ETF USD Dist*¹⁷, which reflects the performance of the Bloomberg Barclays Global Aggregate Corporate Bond Index.

The first part of this section describes the coverage of the study regarding the total assets analyzed and their allocation to the PACTA relevant sectors. The second part presents the PACTA results by sector.

Coverage of the study

The investment portfolios used in this study account for approximately USD 8.7 billion as of 31 December 2020. These assets correspond to the portfolios of 20 insurance companies in Colombia, of which 6 are life insurance companies, 7 are non-life insurance companies, and the remaining 7 operate in both sectors. The group of 20 insurers account for 63% of the total written premium value of the Colombian insurance sector. See Annex for the list of companies covered in this study.

As for the portfolio composition, the analysis finds that 1.3% (USD 111.3 million) of the insurance companies' investments are in listed equity¹⁸, 27.6% (USD 2.4 billion) in corporate bonds, and the remaining 71.1% in other instruments, which include sovereign bonds (91.2% of the other instruments share). As mentioned before, the PACTA methodology focuses on the first two asset classes, i.e., equity and bonds, therefore addressing nearly 30% of the investment portfolio of insurance companies participating in this assessment.

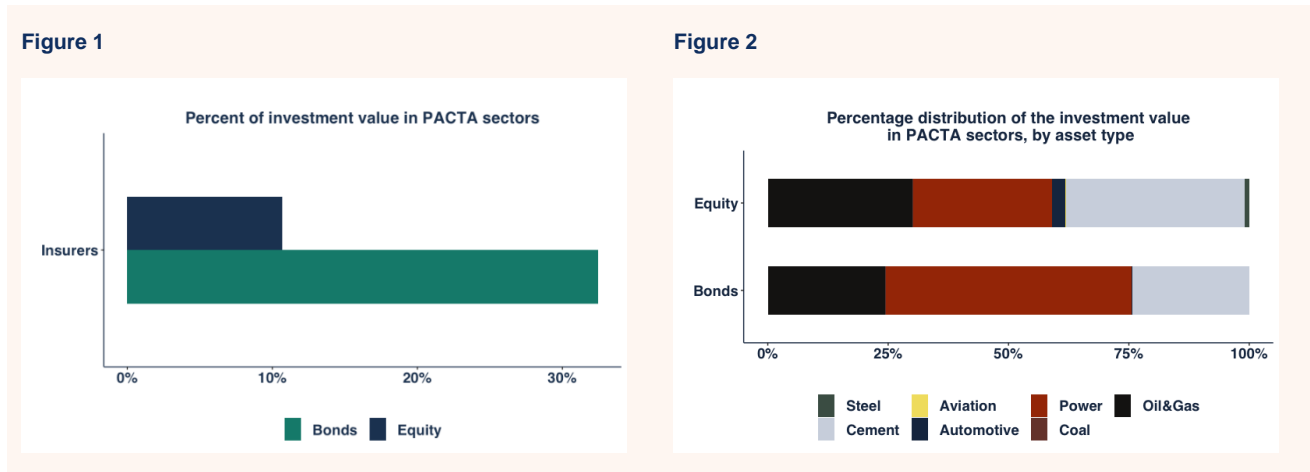
The seven sectors analyzed by PACTA cover 10.7% (USD 11.9 million) of the equity portfolio and 32.4% (USD 783.2 million) of the corporate bond portfolio (Figure 1). The composition of portfolio investments within these sectors varies between asset types, although it is evident that power, oil and gas, and cement are the most relevant sectors in the insurance companies' portfolios (Figure 2). The corporate bond portfolio has a higher exposure to power (51.2%) than the equity portfolio (28.9%), but a lower proportion of oil and gas, (24.4% compared to 30.0%). Cement is the most important sector in the equity portfolio (37.2%), and the third in the

¹⁶ <https://www.ishares.com/uk/individual/en/products/251857/ishares-msci-emerging-markets-ucits-etf-inc-fund>

¹⁷ <https://www.ishares.com/uk/individual/en/products/251813/ishares-global-corporate-bond-ucits-etf>

¹⁸ The relatively low share of listed equity in the Colombian insurance companies' portfolios can be attributed to the regulatory requirements of these institutions.

corporate bond portfolio (24.3%). Other sectors, such as aviation and automotive, represent a significantly lower share of the total exposure to PACTA sectors, although this share is higher in the listed equity portfolio (3.8%) than in the corporate bonds (less than 0.1%).



Climate alignment of listed equity and corporate bond portfolios

Fossil fuels: oil and gas extraction and coal mining

During the last three decades CO₂ emissions have increased year-on-year on an average of 2-3%. Fossil fuel and industry account for around 92% of CO₂ emissions, with coal, oil and gas being the top three fuel types that most contribute¹⁹.

According to the International Energy Agency (IEA), to reach a global temperature increase compatible with an SDS scenario, coal mining needs to decrease approximately 64% by 2040, while oil and gas production need to decrease 31% and 14%, respectively, by the same year. Among the regions covered by the fossil fuel sector scenarios, Latin America will have to make the greatest reduction in coal mining (approximately 87%), while the reductions in oil and gas production will have to be higher in the region than at the global extent (30% and 17%, respectively)²⁰. For this energy transition to happen, several policy changes would need to take place. This includes the phasing out of fossil fuels subsidies, and the implementation of fossil fuel tax schemes.

A portfolio that is heavily exposed to fossil fuel companies will therefore be potentially affected by the transition to a low carbon economy. Changes in policies, such as the ones mentioned above, plus changes in demand and commodity prices, will likely result in risks for investors (i.e., transition risks), as fossil fuel companies may consequently experience re-pricing of financial assets. These dynamics are of particular importance to Colombian insurance companies, given the exposure, although small, of their equity and corporate investments to this sector.

The following analysis is presented to gain an initial understanding of the potential exposure of insurance companies to transition risks affecting the fossil fuel sector.

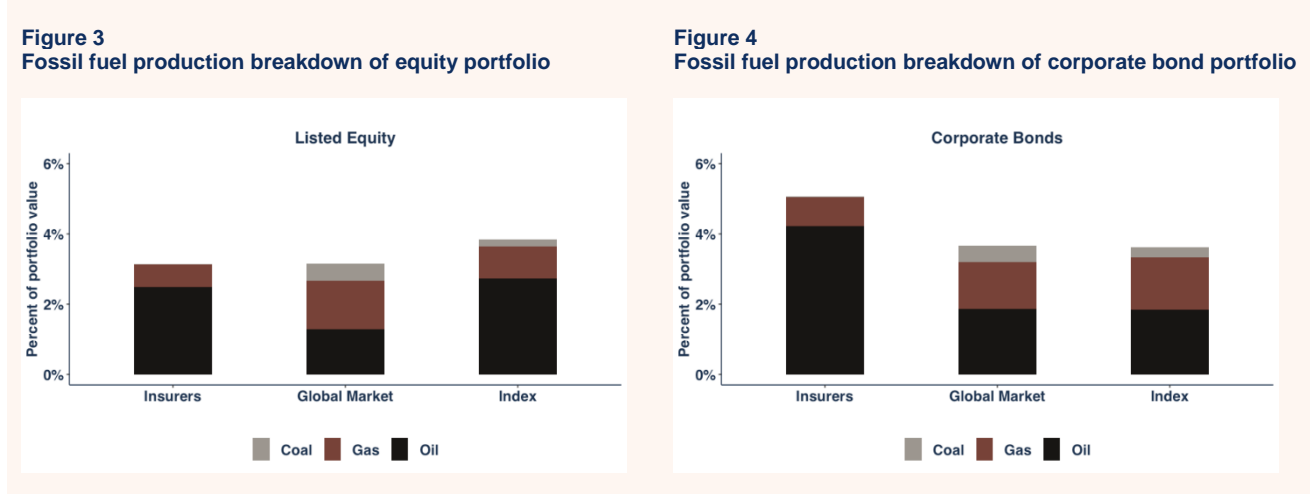
Technology mix

The exposure of insurers' portfolios to fossil fuels accounts for approximately 3.1% of the listed equity and 5.1% of the corporate bond portfolio. Figures 3 and 4 show the fossil fuel production breakdown of both

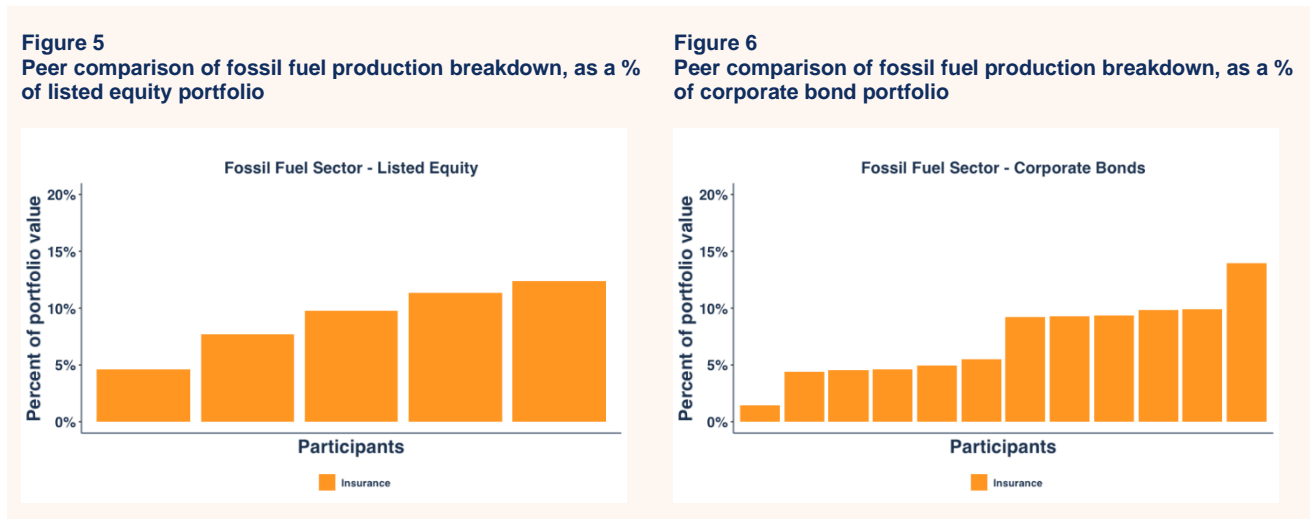
¹⁹ <https://ourworldindata.org/co2-emissions>

²⁰ International Energy Agency, 2020, World Energy Outlook 2020.

portfolios, compared to the global market and the respective index for each asset. The analysis reveals that the exposure of insurers’ portfolios to coal mining is small in both types of investments (around 0.01%), which was also true in the previous analysis of the portfolios conducted in 2019²¹. In addition, the listed equity portfolio has a lower exposure to oil (2.5%) and gas (0.6%), than the corporate bonds, whose exposures correspond to 4.2% and 0.8%. The exposure of the equity portfolio to fossil fuels is very similar compared to the benchmarks, as opposed to the corporate bonds. This means that transition risks affecting these fuels might potentially bring more financial losses to the bonds’ portfolio of insurance companies.



Exposure to fossil fuel production varies between financial institutions. Figures 5 and 6 show the distribution of fossil fuel exposure by participants. Out of the twenty insurance companies, five are exposed to fossil fuels in their equity portfolios, and twelve are exposed to this sector via their corporate bond portfolios. Three insurance companies are exposed to the fossil fuel sector with close to or more than 10% of their listed equity portfolio. In comparison, six companies have an exposure of nearly 10% in their corporate bond portfolio.



Volume trajectory

The PACTA scenario analysis results for the fossil fuel sector find that, despite the low proportion of coal mining in both the listed equity and the corporate bond portfolios, Colombian insurance companies

²¹ For more information on the previous study, see <https://2degrees-investing.org/resource/fasecolda-pacta-scenario-analysis/>

could be potentially affected by transition risks affecting coal mining companies in the next five years, which responds to the companies in the portfolio that are increasing their coal production in a magnitude that is compatible with a >3.2°C scenario. To be aligned with an SDS scenario, the listed equity portfolio needs to decrease coal production plans by 25% in 2026, while the corporate bond portfolio needs a reduction of 35%. Figures 7 and 8 show the trajectory of coal production in the equity and bonds portfolios, also depicting that the reference index is following similar patterns as the portfolios analyzed.

In the case of gas and oil production, the scenario analysis finds that, for both portfolios, the trajectories of production of these fossil fuels are compatible with a <2°C scenario, as issuers are decreasing their production in a magnitude compatible with this scenario, showing a better performance than their benchmarks (see Figures 9 and 10 for the alignment of oil companies in both portfolios. The trajectories for gas production follow the same trend as oil). It can be said, therefore, that companies in the portfolio are adapting to the transition, which could reduce their exposure to transition risks.

Figure 7
Alignment of coal mining in the listed equity portfolio

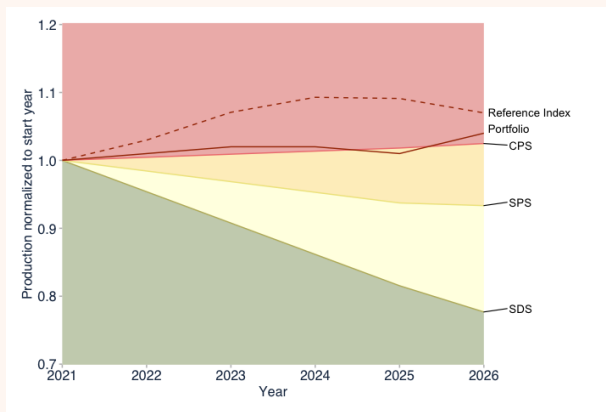


Figure 8
Alignment of coal mining in the corporate bond portfolio

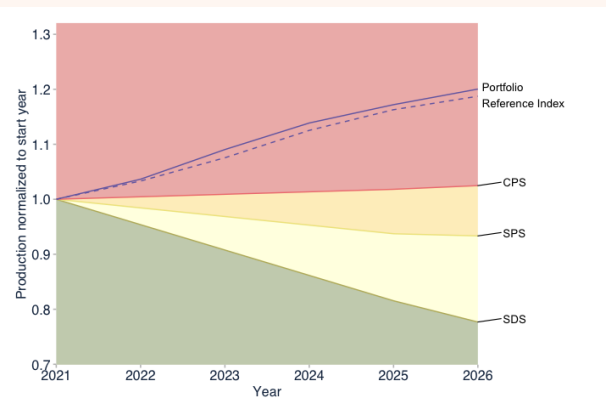


Figure 9
Alignment of oil production in the listed equity portfolio

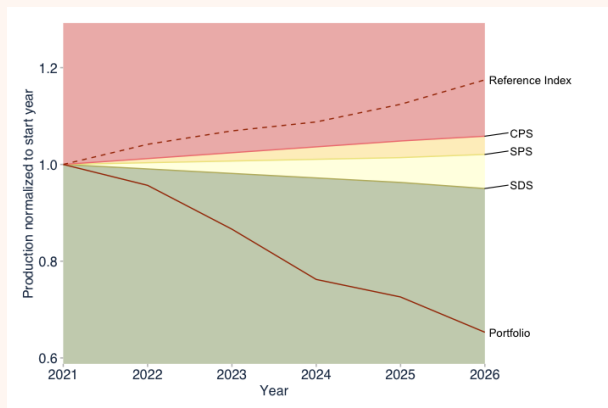
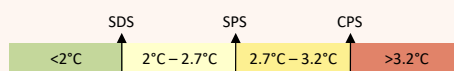
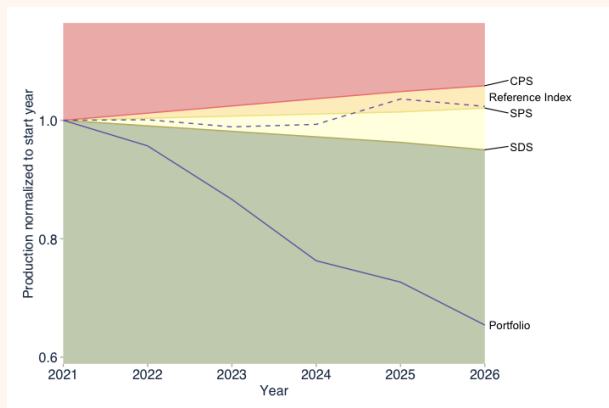


Figure 10
Alignment of oil production in the corporate bond portfolio



Power generation

According to the latest Electricity Market Report published by the IEA, CO₂ emissions from electricity rose by close to 7%, reaching a record high in 2021²². After two years of experiencing a decrease, coal-fired electricity generation reached its highest level since 2011, within a context of rises in electricity demand and lower coal costs, compared to other sources of energy. These dynamics are not aligned with an SDS scenario, which projects global coal-fired capacity to halve by 2040²³. The expected further rise in global demand for electricity that is foreseen in the coming years should therefore be met by cleaner sources of energy, such as renewables.

In global terms, the share of renewables in electricity production accounts for approximately 35%, compared to 63% attributed to fossil fuels²⁴. Most countries in South America have a share of renewable production higher than the global average, mostly coming from a heavy hydroelectric-installed base. Colombia is fifth in the region, with a share of renewables of around 70%, behind other countries such as Paraguay and Uruguay, which are close to 100% renewables based²⁵. The region's greener energy mix is reflected in indicators such as the WEF's Energy System Structure, which tracks the transformation of countries' energy demand and sources of supply and ranks the region higher than other emerging and developing regions in Asia and Europe²⁶. However, WEF's Regulation and Political Commitment index for the region is still far from the global average, which could put pressure on reaching the global net zero targets if there is lower support from governments.

Despite the overall good performance of the power sector in the region, there is still room for improvement. The IEA still estimates that to reach a <2°C, the renewable capacity in Latin America should increase by 54% by 2040, while coal and oil capacity generation will have to decrease by 60% and 28%, respectively, by the same year.

Technology mix

The analysis of the technology mix of the portfolios shows that the power sector represents 3.1% of the listed equity and 13.3% of the corporate bond portfolio (Figures 11 and 12, respectively). The difference between portfolios is explained by the higher exposure of bonds to hydropower capacity, representing 10.8% of the portfolio. The following most relevant technologies in the portfolios are gas power with 1.6%, and renewables with 0.8%. The corporate bonds exposure of Colombian insurance companies to the power sector is higher than the benchmarks.

In terms of the listed equity portfolio, the exposure to the power sector is lower than the benchmarks. However, the ratio between high- and low-carbon technologies (1.9) is higher than both the global market and the index, as well as the ratio for the corporate bond portfolio (0.2). This could mean that the corporate bond portfolios of insurance companies could be potentially less affected by the transition risks.

²² <https://www.iea.org/reports/electricity-market-report-january-2022/executive-summary>

²³ International Energy Agency, 2020, World Energy Outlook 2020

²⁴ <http://energyatlas.iea.org/#!/info/about>

²⁵ Ídem

²⁶ <https://www.weforum.org/reports/fostering-effective-energy-transition-2021/in-full>

Figure 11
Power capacity production breakdown in the listed equity portfolio

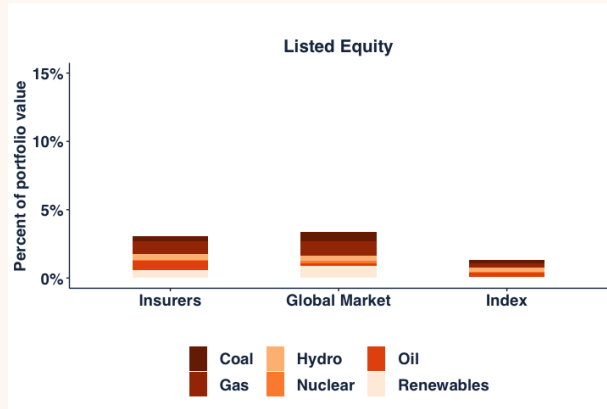
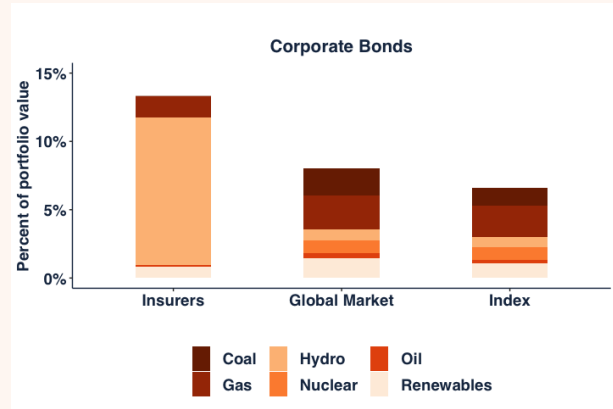


Figure 12
Power capacity production breakdown in the corporate bond portfolio



The analysis on an individual financial institution level shows that five out of the twenty insurers analyzed have exposure to the power sector, and that their share of high carbon power technologies is around 58% on average (Figure 13). Figure 14 complements the individual analysis on the equity portfolio, by comparing the performance of each insurer as a function of exposure to renewables and the percentage of the company’s effort to achieve a Paris-aligned scenario (i.e., an SDS scenario). A portfolio located towards the right of the figure is currently more exposed to renewables, and a portfolio located towards the upper side is making a greater effort to build out renewable energy in the next five years. The results show that two out of five companies have a share of about 40% of their exposure to renewables, but their planned build out is only about 25% of what is required by the SDS scenario. Two other companies have a lower proportion of renewables (about 17%), but their planned build out is about 60% of what is required by the SDS scenario.

Figure 13
Peer comparison of high carbon power production, as a % of listed equity portfolio

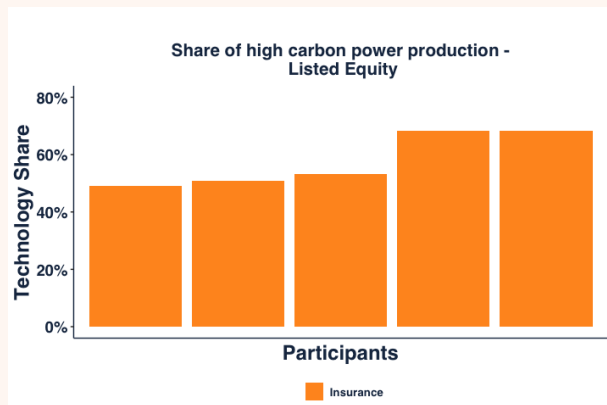
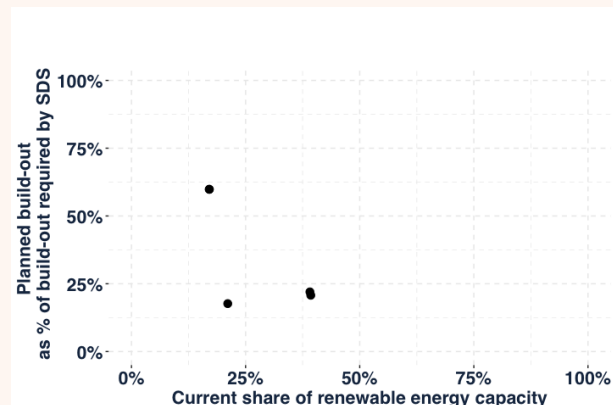


Figure 14
Peer comparison of current exposure vs future build out in renewable power of listed equity portfolio



In the case of corporate bond investments, seventeen out of the twenty insurers have exposure to this sector. The share of high carbon technologies is lower on average (20%) compared to the equity portfolio, although there are two insurance companies with a share of more than 60% of exposure in this type of technologies (Figure 15). The analysis of current exposure vs. build out of renewables shows that although a big majority of insurers have a share of less than 5% in exposure to renewables, most of them have a planned build-out of more than 70% of what is required by the scenario (Figure 16).

Figure 15
Peer comparison of high carbon power production, as a % of corporate bond portfolio

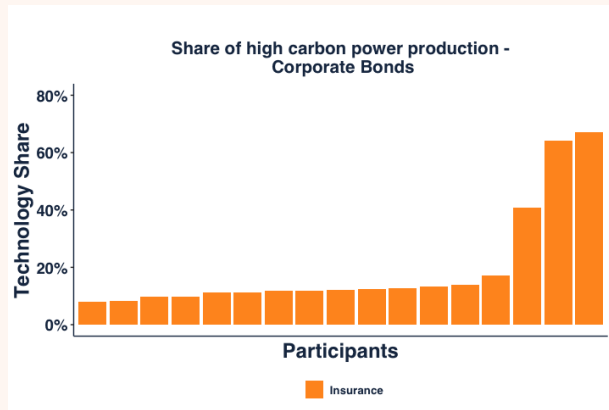
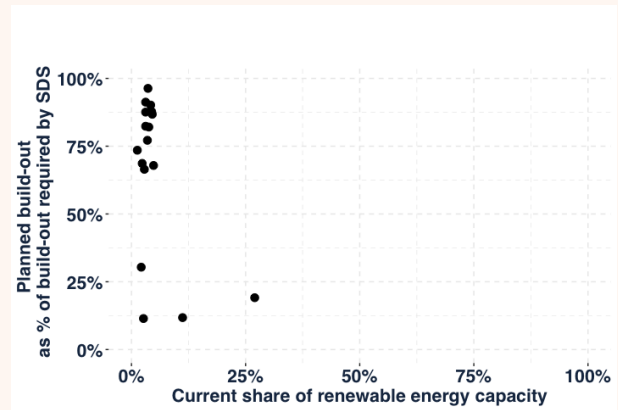


Figure 16
Peer comparison of current exposure vs future build out in renewable power of corporate bond portfolio



To understand if insurers portfolios' exposure to the power sector is adjusting to the transition to a low carbon economy, we compared the current technology mix to the future technology mix (2026). Then to understand the ambition of this adjustment, we compared the latter to the technology mix of the portfolio in a <math><2^{\circ}\text{C}</math> scenario. A difference between the future technology mix and the required mix in a <math><2^{\circ}\text{C}</math> scenario indicates a potential exposure to the transition risks in case a disruptive transition occurs.

The analysis results show that the technology mix of the listed equity portfolio (Figure 17) is not changing substantially in the next five years. The most relevant change observed in this portfolio is in the renewables share, which is slightly increasing, although it is not yet aligned with an SDS scenario. To be aligned with a <math><2^{\circ}\text{C}</math>, the share of brown technologies, and specifically gas and oil capacities, needs to decrease further.

Similarly, the analysis of the corporate bond portfolio technology mix shows few changes in the next five years (Figure 18). There is a small decrease in the share of all capacities, except for renewables, which is increasing. These variations are, however, not aligned with what is required by the SDS scenario. Insurers need to further increase their share in renewable capacity and slightly decrease the proportion of hydroelectric in their portfolios.

Figure 17
Current and future technology mix of power capacity production of the listed equity portfolios as a % of the sector

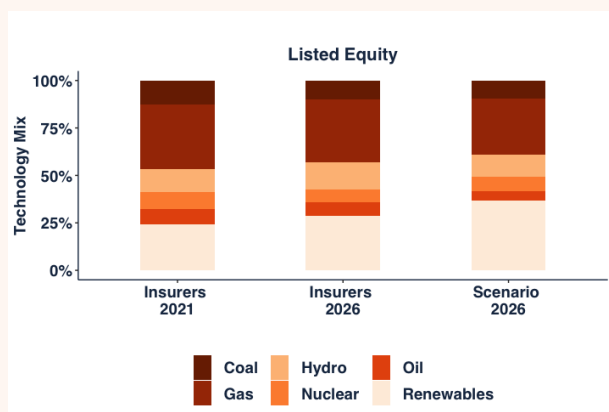
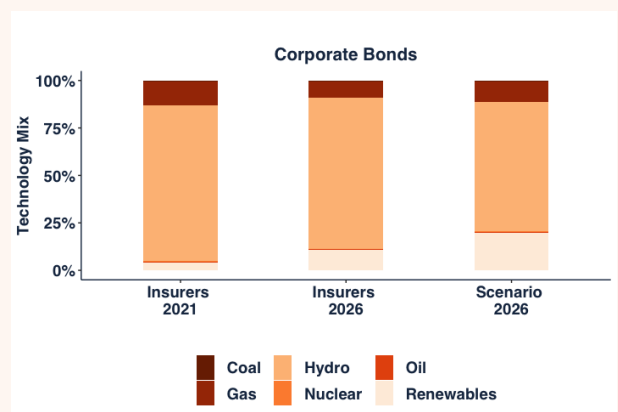


Figure 18
Current and future technology mix of power capacity production of the corporate bond portfolios as a % of the sector

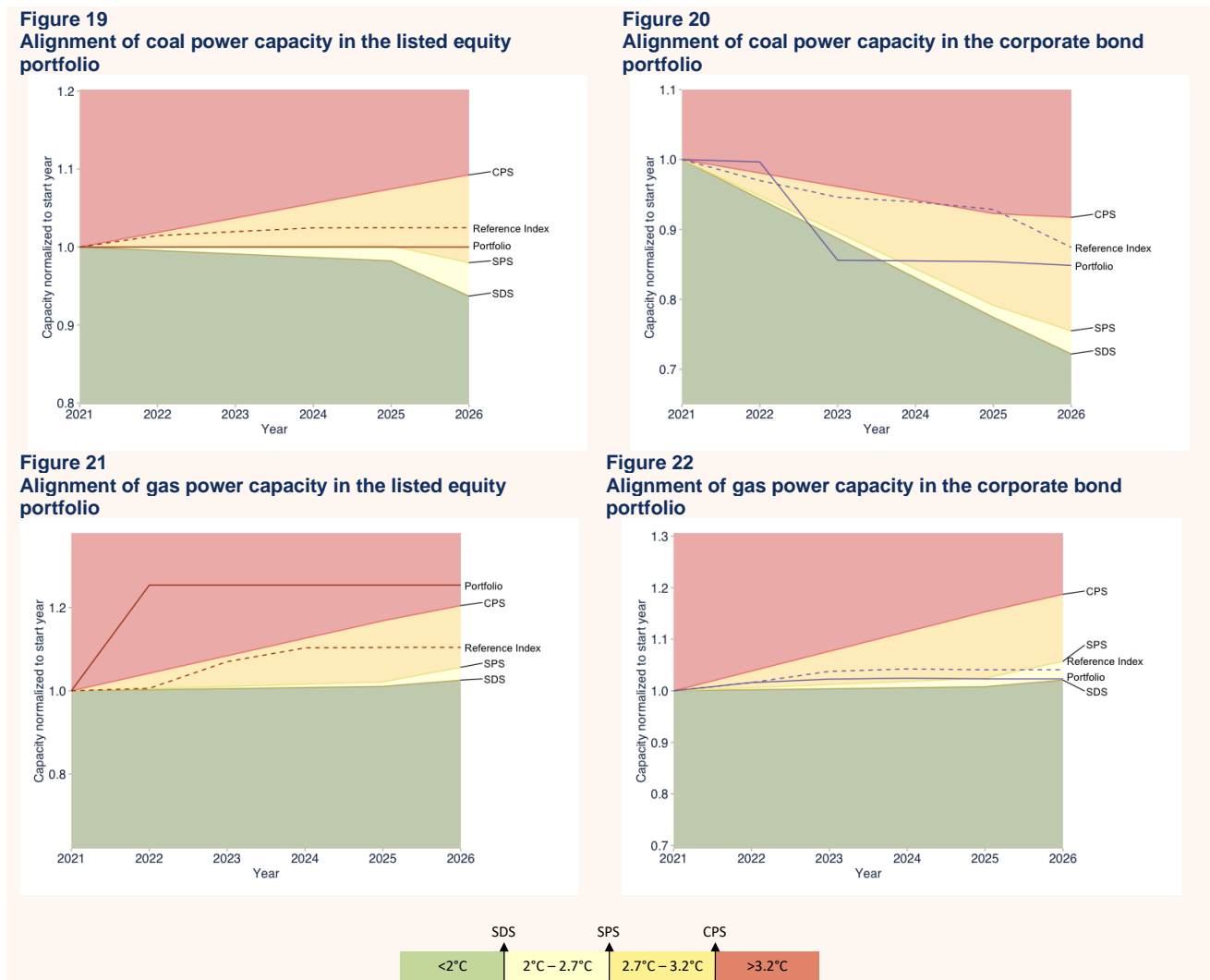


Volume trajectory

The results of the portfolio alignment analysis for the power sector are similar between portfolios. Both are potentially exposed to transition risks affecting all high-carbon technologies, as the portfolios' trajectories are not aligned with a <2°C scenario and are not seizing all the opportunities from the low-carbon technologies.

Figures 19 and 20 show that coal power companies in both the listed equity and the corporate bond portfolios are currently not following what is prescribed by the SDS scenario. Rather, companies in the equity portfolio are keeping their coal-fired capacity constant, while companies in the corporate bond portfolio are not decreasing it enough, making the trajectories of both portfolios compatible with a 2.7°C – 3.2°C scenario. For the portfolios to be aligned with an SDS scenario in coal-fired capacity, a decrease of 6% in coal production is needed in equity, and a reduction of 15% is required in the bond's portfolio. Oil power companies follow the same trend in their trajectories as coal power. Both listed equity and corporate bond portfolios are therefore not following a Paris-aligned trajectory, but instead are compatible with a >3.2°C, and will need a decrease of 10% and 17%, respectively, in oil generation to be aligned with a Paris agreement scenario.

In terms of gas power, the listed equity portfolio is potentially exposed to transition risks, as companies are planning to increase their gas capacity in a magnitude that is compatible with a >3.2°C (Figure 21). The corporate bond portfolio, instead, is not changing its gas capacity substantially and is close to being aligned with a <2°C at the end of the period of analysis (Figure 22). Gas power will need to decrease 18% in the equity portfolio.



Regarding investments in low-carbon technologies, Colombian insurance companies are partially seizing the opportunities that a low-carbon transition would bring. Hydroelectric power companies in both portfolios are planning to increase their hydro capacity in the next five years in a magnitude that is compatible with an SDS scenario (Figures 23 and 24). In terms of renewable capacity, companies' increase in capacity additions in both portfolios is not sufficient to be aligned with an SDS scenario (Figures 25 and 26). The trajectories are, therefore, compatible with a CPS scenario at the end of the five-year period of analysis. For the portfolios to be aligned with a <math><2^{\circ}\text{C}</math> scenario, an increase in the companies build out of 20% by 2026 in the equity portfolios is needed, and 25% in the corporate bond portfolio.

Figure 23
Alignment of hydroelectric power capacity in the listed equity portfolio

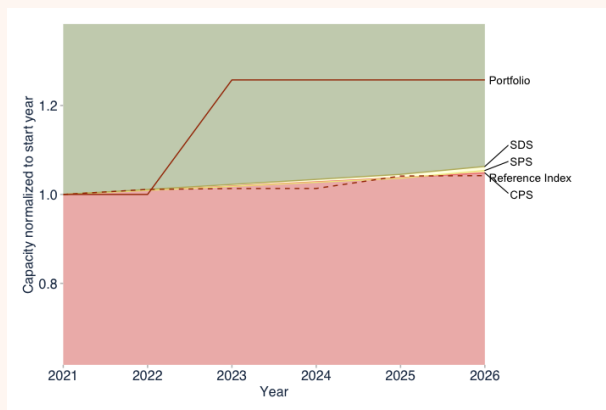


Figure 24
Alignment of hydroelectric power capacity in the corporate bond portfolio

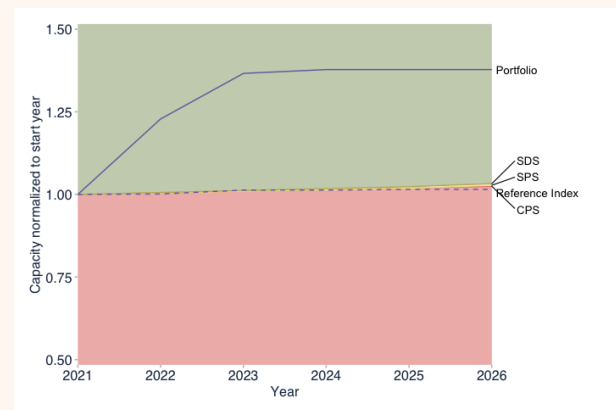


Figure 25
Alignment of renewable power capacity in the listed equity portfolio

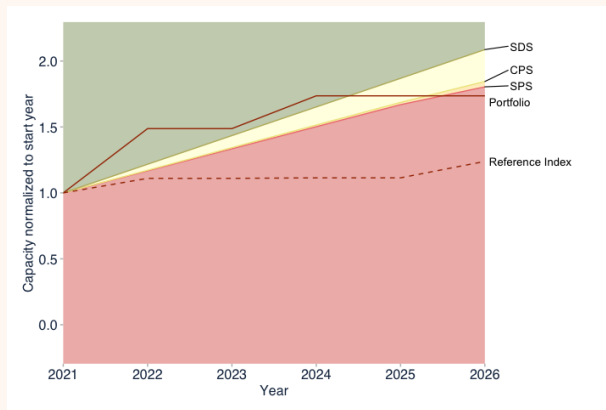
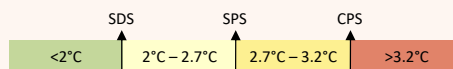
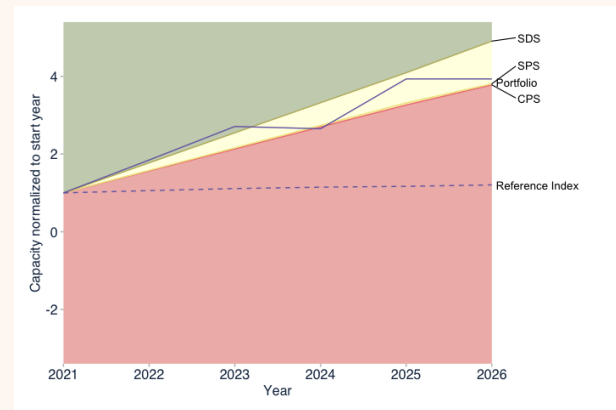


Figure 26
Alignment of renewable power capacity in the corporate bond portfolio



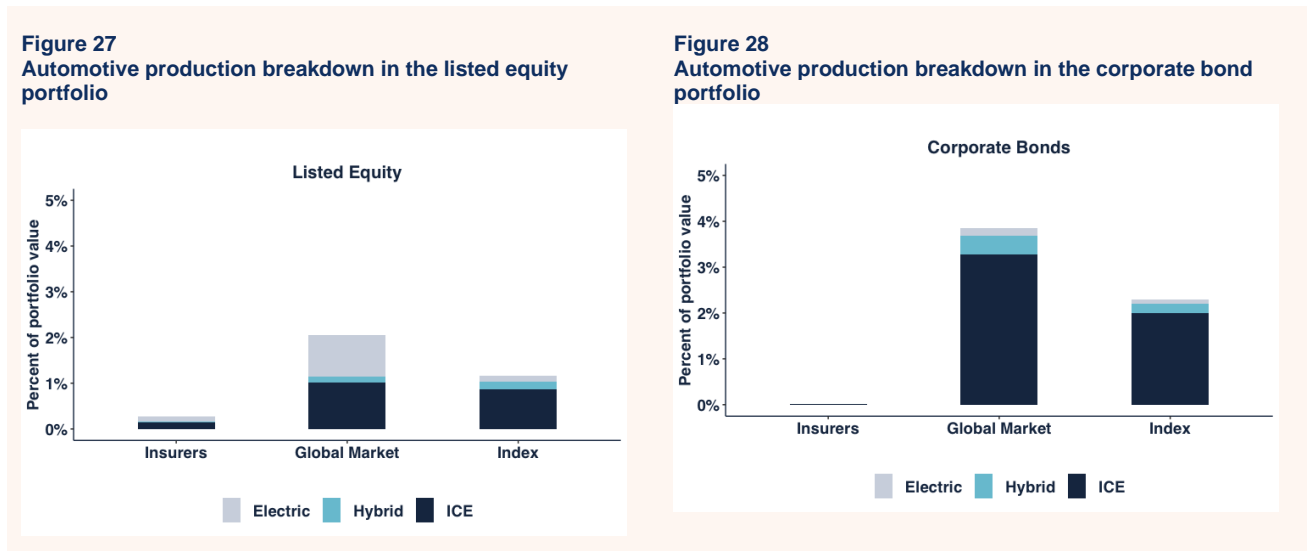
Automotive production (light-duty vehicles)

Data sourced from the IEA and the International Council on Clean Transportation show that almost three quarters of transport emissions come from road vehicles. Only road passenger vehicles (i.e., cars, motorcycles, buses, and taxis) account for 45.1% of transport CO₂ emissions²⁷. The sector is still dominated by Internal Combustion Engines (i.e., diesel and petrol cars), while environmentally cleaner alternatives, such as hybrid and electric vehicles, make up only around 9% of global auto production²⁸.

Car manufacturers could benefit from the transition to a low carbon economy, as the automotive sector faces a fundamental technological revolution in the transition away from ICEs to alternative drivetrains (e.g., hybrid and electric vehicles – EV), as well as potentially fuel cells in the medium-term. However, sustained policy efforts should be put in place to contribute to improving efficiency and electrification in the sector. The IEA projects that the SDS scenario would be met with a decrease of around 15% in sales of ICEs by 2025 and an increase of 38% and 6% in hybrid, and electric vehicles, respectively.

Technology mix

Colombian insurance companies' exposure to the automotive sector is rather low. Around 0.3% of the listed equity and less than 0.1% of the corporate bond portfolio is invested in the production of light-duty vehicles (Figures 27 and 28). These exposures are lower compared to the benchmarks.



Despite the low exposure of both portfolios to the automotive sector, it is still important to note that there is a significant share of exposure to brown technologies in both portfolios. Production of Internal Combustion Engines (ICE) represents 79.5% of the equity portfolio and 88.0% of the corporate bonds. According to the comparison of the current and future technology mixes (Figures 29 and 30), investee companies are planning to decrease their production of this type of vehicles, although this is not enough to meet the requirements of an SDS scenario. To be aligned with the scenario's climate targets, the share of hybrid vehicles needs to increase in both portfolios.

²⁷ <https://ourworldindata.org/transport>

²⁸ 2 Degrees Investing Initiative, based on Autoforecast Solutions data.

Figure 29
Current and future technology mix of automotive production of the listed equity portfolios as a % of the sector

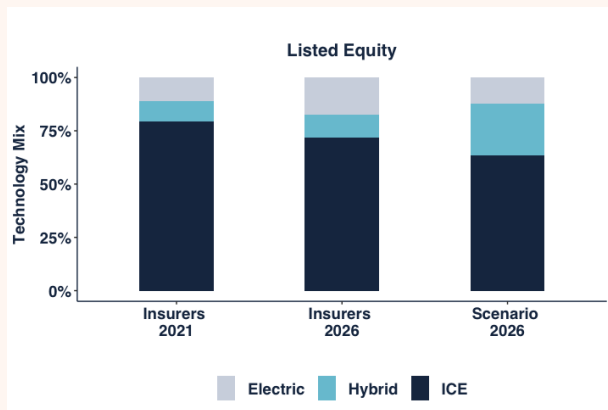
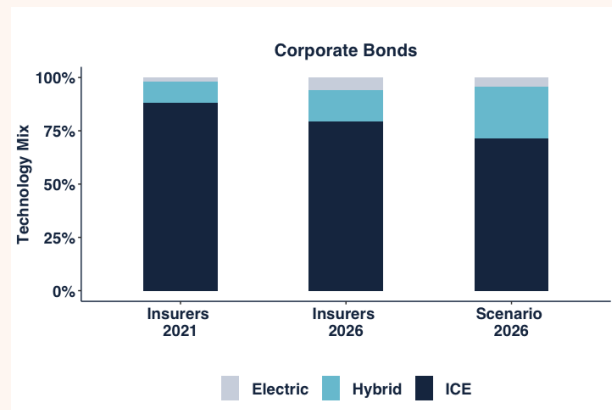


Figure 30
Current and future technology mix of automotive production of the corporate bond portfolios as a % of the sector



Volume trajectory

The scenario analysis results for the automotive sector show that insurance companies are potentially exposed to transition risks arising from a disruptive transition in both the listed equity and corporate bond portfolios. This is given by investments in companies which plan to slightly increase their ICE production within the next five years. Figure 31 shows this trend on the corporate bond portfolio trajectory in ICEs, which is compatible with a >2.5°C. For the portfolio to be aligned with a <1.7°C scenario trajectory, a decrease of 27% in 2026 would be needed.

On the other hand, Colombian insurance companies are partially seizing the opportunities the transition will bring with electric vehicles. Both listed equity and corporate bond portfolios are investing in companies that are planning to increase their electric vehicle production. This is the only low-carbon technology that is compatible with a <2°C scenario, although for the corporate bond portfolio (Figure 32) there is still room for improvement, to achieve a <1.7°C scenario, an increase of 54% in 2026 would be needed. Lastly, the companies' production plans in hybrid vehicles production are slightly increasing, although not sufficiently to meet a Paris aligned scenario.

Figure 31
Alignment of ICEs vehicles production in the corporate bond portfolio

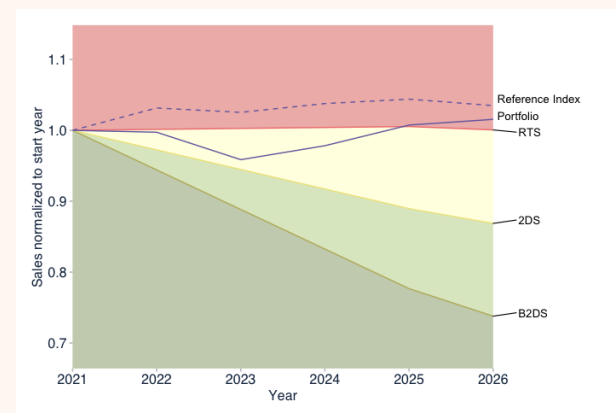
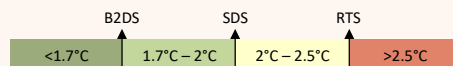
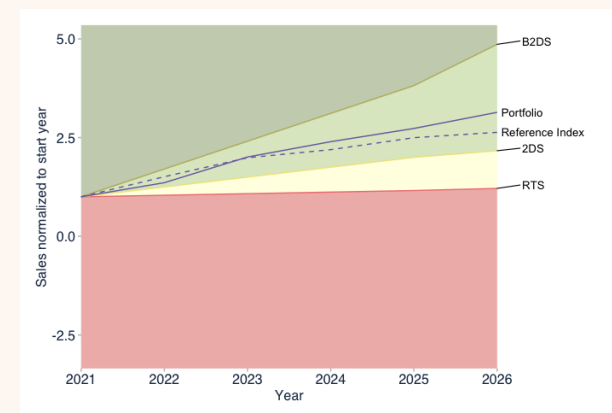


Figure 32
Alignment of electric vehicles production in the corporate bond portfolio



Cement, steel, and aviation

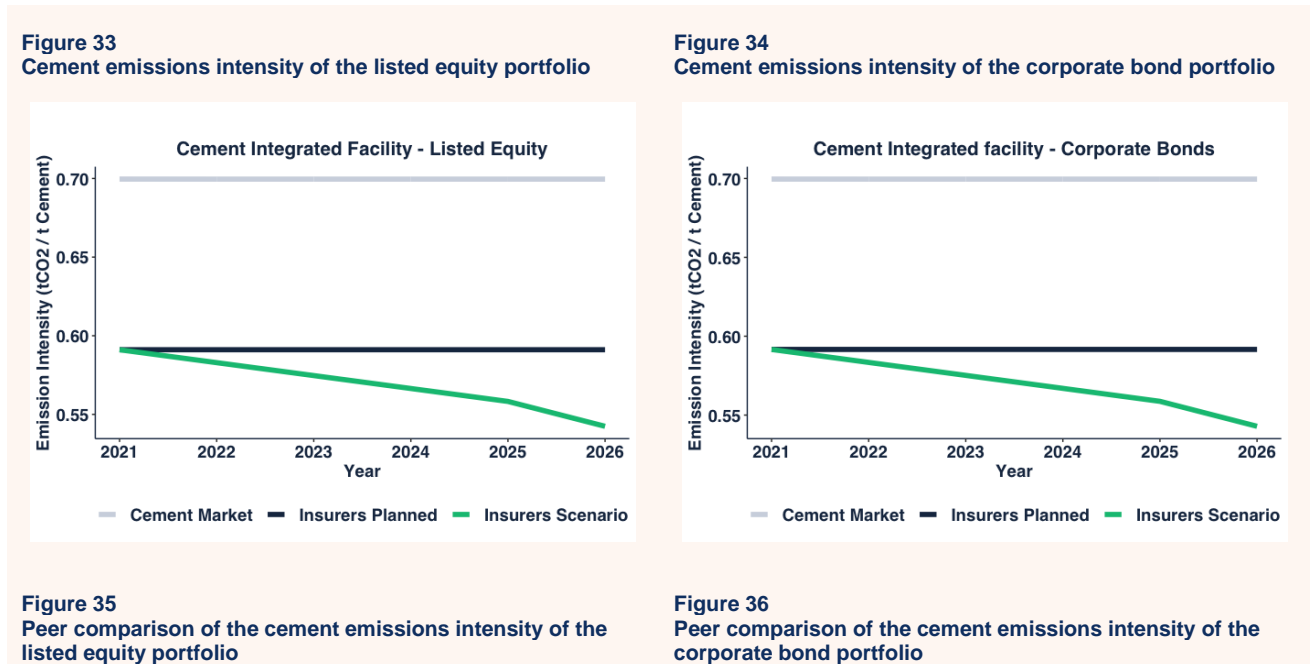
There are a few sectors where no commercially available CO₂-neutral or low-carbon technology has yet been identified in the <2°C scenarios of the IEA, namely cement, steel, and aviation. Efforts in these sectors are confined to increase efficiency in production and use, and to stimulate more investment in innovative technology options to stimulate a decrease in their contribution to global emissions: steel production and aviation account for 8% and 2.5%, respectively to global CO₂ emissions^{29 30}, while cement production contributes to 5% of the CO₂ emissions by fuels, only after coal, oil, and gas³¹.

The portfolios of insurance companies show an exposure to cement of 3.6% in the listed equity, and 5.5% in the corporate bonds. Portfolios' exposure to steel and aviation is minimum (less than 0.001%), although this section presents the results for all three sectors.

This section presents the required portfolio reductions in real economic units, e.g., tons of CO₂ emissions divided by tons of cement. The decarbonization trajectories presented here are based on the Science-Based Targets Initiative (SBTI) Sectoral Decarbonization Approach (SDA), developed by WWF, WRI, and CDP and the IEA ETP 2017 B2DS scenarios.

The results for cement show that both portfolios are mainly concentrated in the integrated facility technology and have similar emissions intensity levels. Both equity and corporate bonds are not aligned with a B2DS but perform better than the aggregated market (Figures 33 and 34). Compared to the other two sectors, relatively lower emission reductions are needed in this sector. Insurance companies should decrease the emissions intensity of both their listed equity and corporate bond portfolios by approximately 8.2% by 2026, in relation to 2021 levels, for their portfolios to be aligned with a <1.75°C.

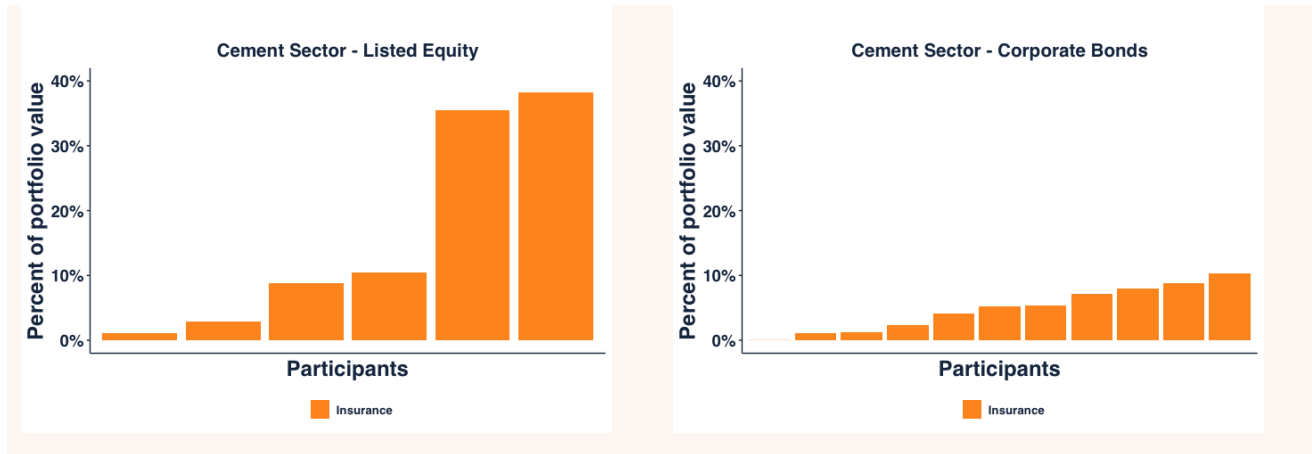
Exposure to the cement sector varies considerably between portfolios. Out of the 20 insurance companies analyzed, 6 have exposure to this sector in their listed equity portfolio. Two of them have an exposure higher than 35% (Figure 35). On the other hand, 11 out of the 20 insurers considered in this analysis have corporate bond investments in cement companies. Their exposure is, however, lower compared to the equity investments, and only insurer has an exposure of more than 10% in their listed equity portfolio (Figure 36).



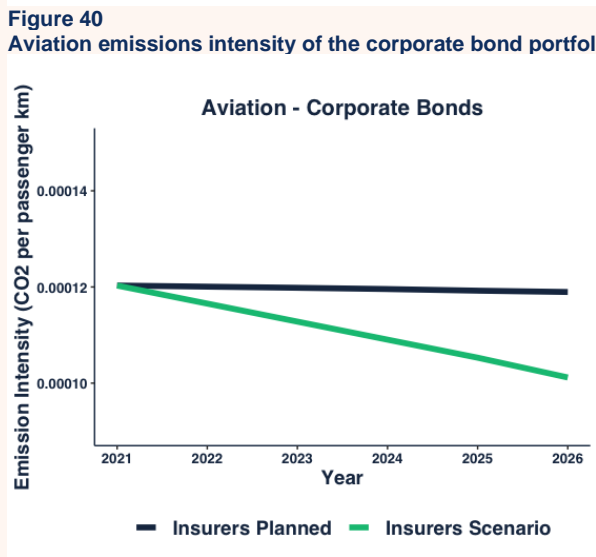
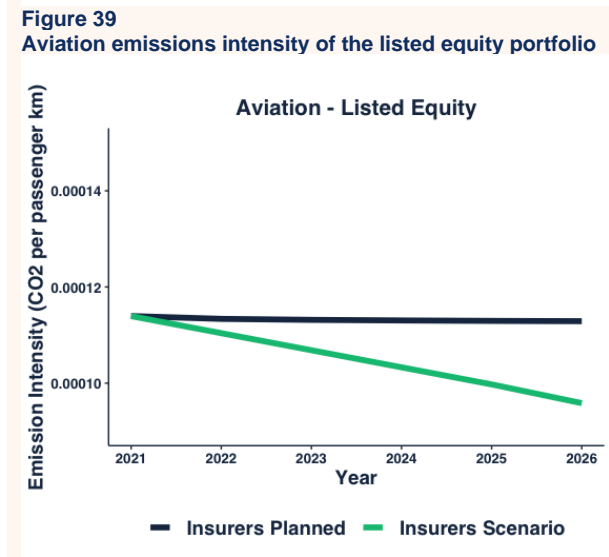
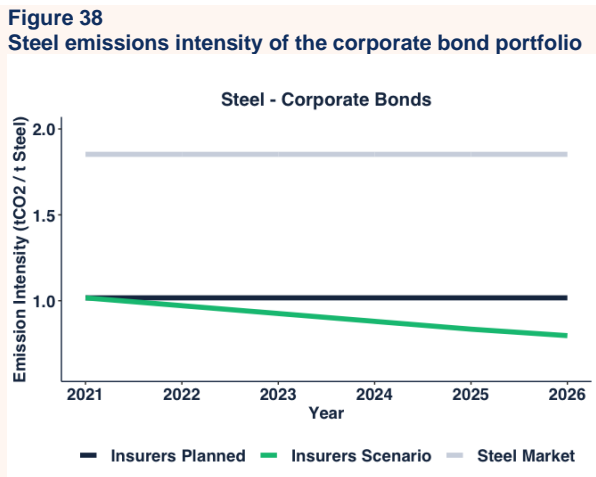
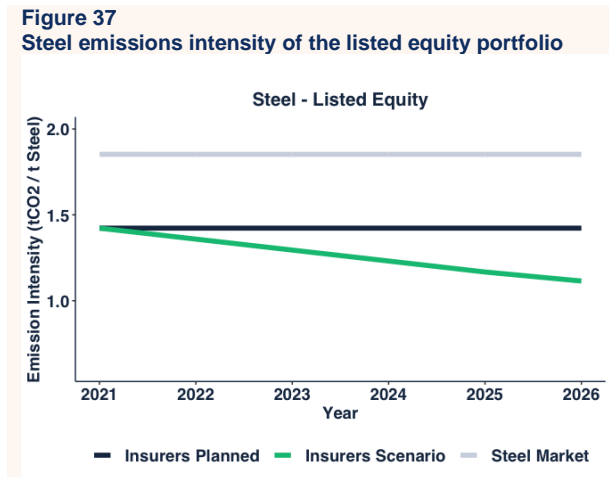
²⁹ <https://www.industrytransition.org/insights/g7-green-steel-production/>

³⁰ <https://ourworldindata.org/co2-emissions-from-aviation>

³¹ <https://ourworldindata.org/emissions-by-fuel>



As for steel, the corporate bond portfolio shows a more efficient behavior, given that investee companies generate a lower amount of CO2 per ton of steel produced (Figures 37 and 38). Both portfolios perform better than the market, but nevertheless are still not aligned with what is prescribed by a B2DS scenario. A decrease of around 22% in the emission intensity of this sector is required for the equity and bonds portfolios to follow a <1.75°C scenario.



Lastly, in the aviation sector the results show that the listed equity portfolio performs better than the corporate bond, although neither are following a B2DS scenario (Figures 39 and 40). Insurance companies need to

decrease the emissions intensity of both portfolios by around 16% by 2026 for the portfolios to be aligned with a 1.75°C scenario.

Results of the climate stress testing exercise

This chapter shows the results of a climate stress testing exercise applied to the portfolios of insurance companies in Colombia. The results reflect the impact that the transition could have on the financial value of the portfolio under a “climate-stress test scenario”, in which a late and sudden transition takes place in 2030. This choice follows the policy forecast made by the Inevitable Policy Response (IPR) project of the UN Principles for Responsible Investment³² for Latin America, which projects late policy action in most Latin American countries, including Colombia.

The results show two types of analysis that were carried out, using the listed equity and corporate bond portfolios of the 20 insurance companies that participated in this study:

- Aggregated analysis for each portfolio (i.e., listed equity and corporate bond) to quantify the total sectors value loss.
- Breakdown of the value loss by technology/fuel type of each portfolio to identify the main drivers of the risk.

As mentioned in Chapter 2, the stress testing analysis covers three sectors, namely upstream fossil fuels, power generation, and automotive production. These sectors account for 61.7% and 75.7% of the PACTA-covered listed equity and corporate bond portfolios, and 0.08% and 6.8% of the total portfolio, respectively.

The first type of analysis aims to measure the aggregated potential value loss of the three sectors in the case of a late and sudden transition in 2030. Table 1 summarizes the size of both portfolios (listed equity and corporate bonds), the value of the climate sectors analyzed and the value change within each portfolio under a late and sudden transition. The same information is also depicted in Figures 41 and 42, which show the results of the stress testing exercise for the equity and bonds portfolios, respectively.

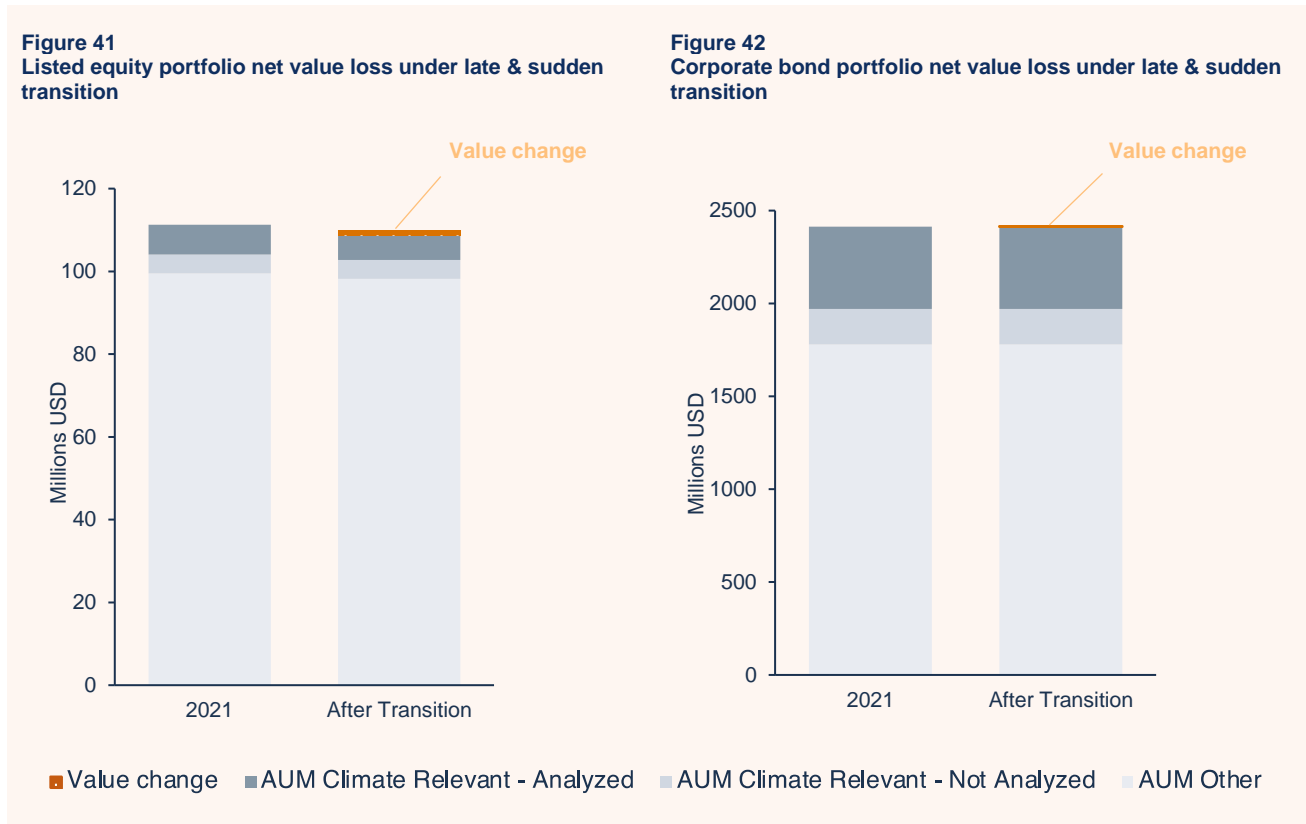
Table 1. Summary of the stress testing exercise results

Asset type	Total value AUM (MIn USD)	Climate Relevant – Analyzed (MIn USD)	Climate Relevant – Not Analyzed (MIn USD)	Stress value change (MIn USD)	Percentage stress value change (%)
Listed equity	111.3	7.2	4.6	1.3	1.18%
Corporate bonds	2,414	444.4	190.6	1.5	0.06%

The results show that the listed equity portfolio experiences a net value loss of USD 1.3 million, which corresponds to 1.18% of the total listed equity portfolio. In the case of the corporate bond portfolio, the net value loss is USD 1.5 million, or 0.06% of the portfolio. To put the results into perspective, the figure

³² <https://www.unpri.org/the-inevitable-policy-response-policy-forecasts/4849.article>

compares the value loss as % of the AUM with the portfolio exposure to the climate relevant sector analyzed (i.e., power, fossil fuels and automotive) and the exposure to other climate relevant sectors not analyzed (i.e., cement, steel, aviation).



The second type of analysis contributes to understanding the drivers of the net value changes of each portfolio. **The breakdown of the listed equity portfolio value loss by technology (Figure 43) shows that the net value loss is mainly explained by the fossil fuels sector, in particular, by investments in oil and gas companies.** This result might come as a surprise considering that the scenario analysis results showed that the portfolio’s exposure to gas and oil production was compatible with a 2°C scenario. This is because the “worst-case” scenario used in the stress testing exercise assumes that companies in the portfolio are planning to follow the increase projected in the SPS scenario (as it was shown in Figure 0.3 of this report). Within the automotive sector, the ICE technology also experiences losses, although the magnitude is comparatively lower than the losses in the fossil fuels technologies.

In the power sector, most technologies also show a value loss, except for renewables. The exposure to this technology in the equity portfolio outweighs the potential losses arising from the exposure to higher carbon technologies.

The overall trends observed by technology in the corporate bond portfolio are quite similar to those observed in the listed equity portfolio. Figure 44 shows that fossil fuels technologies in the bonds portfolio also show the biggest losses, therefore contributing to the aggregated result. On the other hand, the high exposure of the corporate bond portfolio to the power sector, and the related high weight of low carbon technologies, ultimately outweigh the losses by upstream oil and gas companies.

Figure 43
Listed equity portfolio net value loss/gain by technology

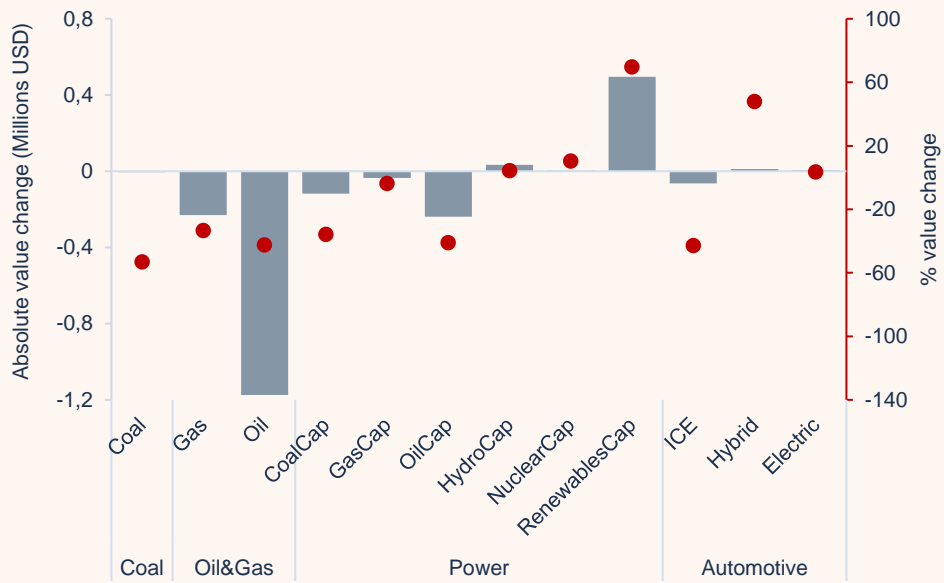
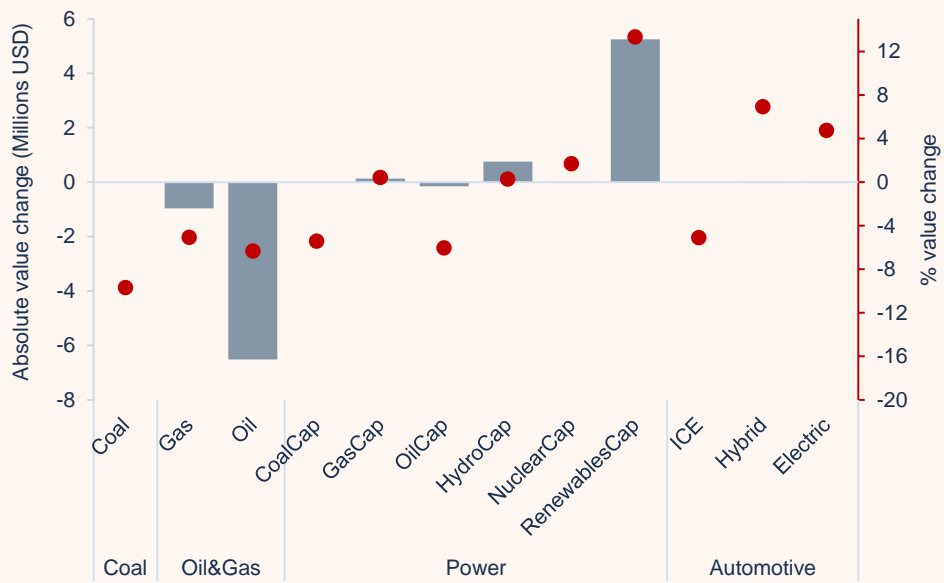


Figure 44
Corporate bond portfolio net value loss/gain by technology



Conclusion

The analysis presented in this report sheds light on the climate compatibility of investments by 20 insurance companies in Colombia that voluntarily participated in this study, which is part of the project *Preparing the public and financial sector for Climate transition risk: Capacity building and call to action*, financed by UK PACT Colombia. The objective of the assessment was to quantify the exposure of insurance companies to climate-related risks and opportunities and to measure the alignment of this exposure with climate scenarios, through the implementation of the PACTA scenario analysis methodology.

This study covered USD 8.7 billion, which corresponds to the investment portfolios of the insurance companies analyzed. The PACTA analysis addresses almost 30% of the total investments, by focusing on listed equity (1.3%, or USD 111.3 millions in assets under management) and corporate bonds (27.6%, or USD 2.4 billion in assets under management). Within each of these asset types, the seven key and critical climate related sectors cover 10.7% of the equity portfolio and 32.4% of the corporate bond portfolio. Investments in energy, oil and gas, and cement sectors are the most representative among the seven sectors covered in the methodology.

The aggregated analysis shows that the risk and opportunity dynamics in each portfolio are different and calls for insurance companies to examine how to mitigate climate risks and maximize opportunities. The analysis finds the following risks and opportunities, followed by recommendations.

Risks: Despite the relatively small value of the equity portfolio invested in PACTA sectors, the exposure to the power sector is still important, given the higher ratio between high- and low-carbon technologies, when compared to the benchmarks and the corporate bonds' portfolio. Issuers in the equity portfolio are not planning to decrease their power capacity based on high-carbon technologies, which makes them deviate from a <2°C scenario. Thus, the three technologies – coal, gas, and oil capacity – contribute to the listed equity portfolio value loss.

The exposure of both portfolios to coal mining and the production of ICE vehicles is significantly low, but the investee companies' production plans are still far from a SDS. The contribution of these technologies to the portfolio value loss is almost negligible, but it is important to consider it in the overall results.

Opportunities: Insurance companies are partially seizing the opportunities the transition will bring through their corporate bond investments in low-carbon technologies. On the one hand, the share of hydropower capacity investments in the corporate bond portfolio is substantially higher than what the scenario prescribes, and the production plans of companies in both portfolios are aligned with a <2°C scenario in hydropower. On the other hand, although there is an increase in both portfolios of the share of investments in renewable capacity, a higher proportion of this technology is needed, and issuers will have to make additional adjustments in their planned capacities to be aligned with a Paris-aligned scenario. These two technologies contribute positively to the portfolio value gains in the too-late, too-sudden transition model.

The exposure to electric vehicles also contributes to the value gains, in particular for the corporate bond portfolio, but the contribution is negligible compared to other technologies.

Recommendations and next steps. The measurement and analysis of the risks and opportunities that a low-carbon transition would bring for insurance companies in Colombia paves the way for the design and implementation of strategies to prevent the materialization of climate-related risks.

Nevertheless, the application of the existing measures to mitigate risks greatly depends on the existing regulation, the level of diversification of the local market, and the investment strategies and capacity of each insurance company to carry out different actions. Given the specificities of the Colombian economy and financial market, most of the alignment strategies that insurance companies can choose will be focused on the capacity for engagement between financial institutions and issuers. This is one of the most common actions chosen by

institutional investors globally and can be of great relevance to guide and change corporate behavior towards more climate-related consciousness.

While the implementation of the PACTA methodology contributes to the constant efforts of the Colombian insurance sector to measure the alignment of their portfolios with climate goals, it is important to note that this study does not consider the investments in public debt, which represent the highest proportion of the investment portfolios of Colombian insurance companies. Transition risks can equally impact sovereign bond value, mainly through changes in the institutional, economic, and fiscal strength of countries in which financial institutions have investments. Further research in this area is therefore crucial for insurance companies in Colombia to have a deeper understanding of their potential exposure to transition risks.

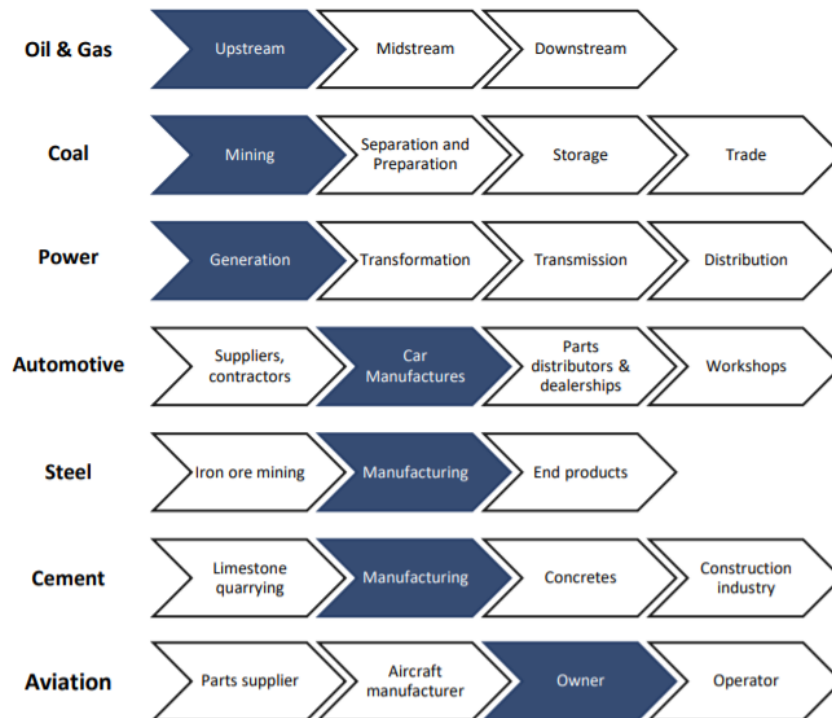
Based on these findings, insurance companies in Colombia should continue strengthening their capabilities in the assessment of climate-related risks exposure and integrate climate change considerations into their decision-making strategies. This will be in line with the recommendations of the Portfolio Alignment Team, which encourages the use of portfolio alignment tools to inform target setting and management decisions³³. The forward-looking nature of the assessment presented in this report also provides an opportunity for insurance companies to comply with the guidance from the Taskforce for Climate-related Financial Disclosures (TCFD), which encourages financial institutions to disclose and inform stakeholders about how the organizations are positioning themselves considering the risks and opportunities identified.

Lastly, it is important to bear in mind that the methodologies used for this analysis will continue improving over time (e.g., in terms of risks and sector coverage, methodological choices, and scenarios available) as data availability improves and more research is carried out. The results presented here should be interpreted carefully and should complement the already identified evidence that Colombian insurance companies are potentially exposed to transition risks, which is expected to be continuously monitored over time.

³³ https://www.tcfhub.org/wp-content/uploads/2021/10/PAT_Measuring_Portfolio_Alignment_Technical_Considerations.pdf

Annex

Segments of the value chain covered by the PACTA model



Limitations of the Analysis

As in any other model, there are a number of limitations to the PACTA climate scenario analysis for equity and corporate bonds conducted in this report, some of which are mentioned below.

1. Data received from financial institutions: To perform the exercise, we asked entities to upload all their investments, except their cash portfolios. 2DII does not perform any validation or audit of the data, so the study relies on the commitment of the entities to upload the requested portfolio information.
2. Climate scenario assumptions: The climate scenarios we used in this analysis present one possible manifestation of how an energy transition aligned with the Paris climate agreement could look like. Even though the necessary actions are not controversial (expansion of renewables, retirement of high-carbon technologies), the precise way in which a remaining carbon budget is distributed across sectors will be achieved in different ways by different scenarios. In this sense, different models will include different assumptions about the future development and potential of certain technologies. This analysis therefore focuses on those technologies that are proven and available to the market. As a result, this analysis does not consider investments in R&D or early-stage private equity, which represent an important way for financial institutions to help bring new solutions to the market. Additionally, while scenarios are expected to incorporate all socioeconomic considerations, they do not consider regional-specific policies or regulation. For this reason, it is expected that for some technologies alignment may be more difficult or even unfeasible.
3. Asset based company level data used: Although we sourced the data from reliable third-party data providers, errors are possible, either in the production plans themselves, or in mapping the ownership structure of companies. Furthermore, planned production plans do not necessarily materialize and production forecasts should be interpreted bearing this in mind.
4. Scope of the analysis. PACTA does not cover certain sectors, such as agriculture and forestry, even though they are highly relevant for limiting future GHG emissions, due to lack of available data. Furthermore, asset classes such as sovereign bonds or private equity are also not included in the analysis.

Companies covered in the study

Group Name	General	Life
Alfa	Seguros Alfa S.A.	Seguros de Vida Alfa S.A. Vidalfa S.A.
Aurora		Compañía de Seguros de Vida Aurora S.A.
BBVA	BBVA Seguros Colombia S.A.	BBVA Seguros de Vida Colombia S.A.
Berkley	Berkley International Seguros Colombia S.A.	
BMI		BMI Colombia Compañía de Seguros de Vida S.A.
Cardif	Cardif Colombia Seguros Generales S.A.	
Estado	Seguros del Estado S.A.	Seguros de Vida del Estado S.A.
Global		Global Seguros de Vida S.A.
HDI	HDI Seguros S.A.	HDI Seguros de Vida S.A.
Mapfre	Mapfre Seguros Generales de Colombia S.A.	Mapfre Colombia Vida Seguros S.A.
Metlife		Metlife Colombia Seguros de Vida S.A.
Mundial	Compañía Mundial de Seguros S.A.	
Positiva		Positiva Compañía de Seguros S.A.
Previsora	La Previsora S.A. Compañía de Seguros	
SBS	SBS Seguros Colombia S.A.	
Segurexpo	Segurexpo de Colombia S.A.	
Skandia		Skandia Compañía de Seguros de Vida S.A.
Solidaria		
Suramericana	Seguros Generales Suramericana S.A.	Seguros de Vida Suramericana S.A.
Zurich	Zurich Colombia Seguros S.A.	