FULLERTON
FUND MANAGEMENT

Task Force on Climate-related Financial Disclosures 2022

Contents

1. Executive Summary **3**

2. Governance **6**

A. Board oversight 6

B. Role of management 6

3. Strategy **8**

A. Risks and opportunities identified and their impact 8

B. Scenario analysis and climate resilience 12

4. Risk Management **16**

5. Metrics & Targets **17**

A. Investment level 17

B. Corporate level 18

6. Appendix: Climate Risk Scenario Analysis **22**

Executive Summary

This is Fullerton Fund Management's ("Fullerton") second public report on our response to the recommendations of the Task Force on Climate-related Financial Disclosures ("TCFD"). The purpose of the report is to provide our stakeholders and clients with an understanding of how we are managing and mitigating climate-related risks in our business and investment portfolios. This report has been developed in line with MAS Environmental Risk Management Framework.

As a supporter of TCFD recommendations, we know how important it is to sufficiently understand and mitigate climate-related risks both on the investment and corporate levels. We have a governance structure and risk management framework in place to monitor and manage our climate-related risks. To reflect our sustainability strategy and procedures in this evolving environment, we have updated our climate risk scenario analysis to better understand the physical and transition risks and the impacts. We understand climate change will have a far-reaching impact on our investment and our stakeholders are attaching more focus on Fullerton's capability to mitigate climate-related risk as a firm. Climate-related risks are now embedded in our risk management processes and are regarded as material to our investment decision making process and corporate level development. We have also identified metrics to monitor our progress in climate-related risk management and plan to evaluate the feasibility of setting carbon neutral and decarbonisation target in the long term.

Here we summarise the key points in response to the TCFD recommendations.

TCFD Recommendations	Key Points
Governance: Disclose the organisation's governance around climate-related risks and opportunities.	
Describe the board's oversight of climate-related risks and opportunities	The Board of Directors ("Board") reviews and approves Fullerton's sustainability strategy on an annual basis and ensures sufficient resources are provided. The Board and Board-level sub-committee, the Audit & Risk Committee, oversee climate- related risk issues. ESG and related environmental risks are encapsulated in the Enterprise Risk Management Framework approved by the Board.
Describe management's role in assessing and managing climate-related risks and opportunities	The Executive Committee oversees the development and implementation of Fullerton's sustainability strategy. The Sustainability Committee (previously the ESG Committee) was established under the Executive Committee's purview to manage and coordinate the implementation of sustainability work matters across the firm. To ensure the effective implementation of our sustainability strategy, relevant framework, policies, tools and metrics are reviewed, and functional teams work collaboratively with clear responsibilities.
Strategy: Disclose the actual and potential impacts of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning where such information is material.	
Describe the climate-related risks and opportunities the organisation has identified over the short, medium, and long term	Policy, legal, market, reputation, technology, acute and chronic risks are identified at both the investment level and corporate level.

Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning	As an active asset manager, we believe that integrating climate-related factors in our research and analysis gives us a more thorough understanding of the climate-related risks and value drivers that may impact the companies we invest in. In turn, this is reflected in the investment performance of our portfolios. We view climate change as an important component in product development, portfolio construction and investment processes. We also analyse the impact at the company level. At the corporate level, transition risks are likely to increase our operational cost in the short term and physical risks impact our contingency work plans in the long term.
Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	Fullerton conducted its second climate risk scenario analysis exercise using our portfolio holdings for FY2022. Compared with the previous scenario analysis, we further enhanced our analysis of physical and transition risks, by using actual portfolio data to assess the risks and impacts on our business. The Appendix provides a detailed description of the methodology and process.
Risk Management: Disclose how the organisation identifies, assesses, and manages climate-related risks	
Describe the organisation's processes for identifying and assessing climate-related risks	Climate-related risk management is implemented through a 3 Lines of Defence Model. The first line is the business units – Investment teams and the Business Management teams – which manage the risks inherent in our day-to-day business. The second line includes the Risk Management and Compliance functions, to provide independent oversight of our investments and operations. The Risk Management team monitors the business' implementation of sustainability policies, and challenges practices and decisions, where appropriate. The Compliance team ensures that we are compliant with regulatory requirements. The third line is internal audit, which independently assesses the adequacy and effectiveness of internal controls and provides assurance to Fullerton's Board of Directors and Executive Committee on the effectiveness of the internal controls.
Describe the organisation's processes for managing climate-related risks	
Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organisation's overall risk management	

Metrics and Targets: Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material	
Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process	The investment level metrics include ESG integrated Assets under Management (AUM) and engagements on topics including climate change. The corporate level metrics include progress on climate neutrality, as well as carbon emissions and carbon intensity.
Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks	The total GHG emissions for 2022 is 264.90 tCO2e. The detailed data of Scope 1, 2 and 3 are presented in Table 5. We will continue to be climate neutral by offsetting corporate GHG emissions every year.
Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets	We track the progress of metrics annually. We started to evaluate the feasibility of setting carbon neutral and decarbonisation targets in the long term based on the results of our climate scenario analysis and the carbon footprint analysis.

We will continue to monitor and report on our progress regarding climate-related risk management. We plan to continue to explore evolving tools and constantly improve our strategy by incorporating best practices to better understand and mitigate climate-related impacts on our business and clients' investment portfolios.

Governance

The Board reviews and approves Fullerton's sustainability strategy on an annual basis and ensures sufficient resources are provided. The role of the Executive Committee is to oversee the implementation of the strategy in an efficient and effective way.

A. Board oversight

The Board reviews and approves Fullerton's sustainability strategy on an annual basis and ensures it is in line with the corporate strategy. The Board and Board sub-committee, the Audit & Risk Committee, oversee climate-related issues and ensure that we are consistent in our plans. In 2022-2023, the sustainability strategy, approach, progress and plans were discussed and reviewed by the Board, and these included the risks and plans related to climate change and how we are compliant to the requirements. In July 2023, the climate risk scenario analysis results and action plan from the analysis were endorsed by Audit & Risk Committee. Other key climate-related issues reported by the Head of Sustainability included the corporate level carbon neutrality plan and enhanced metrics for high-emitting portfolio industries. Sustainability issues, including climate-related risks and opportunities, will be further considered in the review of the firm's corporate strategy, annual budget planning, performance objectives of relevant directors and teams, stewardship and monitoring process.

Specific roles and responsibilities for overseeing and mitigating sustainability risks are set at the Board level and Executive Committee level. The Board sub-committee, the Audit & Risk Committee, is responsible for approving the Enterprise Risk Management Framework which includes sustainability risk and related environmental risks. The Board ensures there is adequate and appropriate understanding, expertise, headcount, resources and tools for the efficient management of ESG factors in our business and in clients' investment portfolios.

B. Role of management

The Executive Committee oversees the development and implementation of Fullerton's sustainability strategy. The Head of Sustainability updates the Executive Committee on the progress of the strategy implementation on a regular basis. To better manage and coordinate the implementation of sustainability matters across the firm, a Sustainability Committee (previously ESG Committee) was established under the Executive Committee's purview in August 2022. The Sustainability Committee comprises heads or representatives from the following teams – Risk Management, Sustainability, Legal and Compliance, Data Strategy and Management, Human Capital and Business Development. Climate-related issues are discussed in the Sustainability Committee's monthly meeting and reported to the Executive Committee and further to the Board. In 2022 and first half of 2023, key climate-related issues raised during the Sustainability Committee meeting include progress and endorsement for TCFD report, Active Ownership Policy, Sustainable Procurement Policy, sustainability materiality metrics and Sustainability Framework.

Internal teams have been delegated with clear responsibilities and collaborate to implement our sustainability strategy. The Executive Committee is responsible for overseeing ESG integration into both investment and corporate processes. The Executive Committee reviews the effectiveness of sustainability-related and environmental-related management framework, policies, tools and metrics. It makes appropriate revisions based on the internal and external changes. It also provides sufficient support for capacity building, innovation, raising awareness and knowledge sharing. We are considering the integration of climate-related targets and indicators into the incentive structures for relevant Executives and teams. The purpose is to ensure that all levels and functions have a common understanding on the materiality of climate change and its impact on the firm, and appropriate actions are taken accordingly.

The Sustainability team plays a critical role in developing the responsible investment strategy and corporate sustainability initiatives. All members of the Sustainability team have a deep understanding and hands-on experience in sustainability management. The team works closely with management to execute the sustainability strategy and assist in the implementation of sustainability management procedures. The team also provides relevant training to upgrade the firm's understanding of sustainability matters and enhance sustainability capability.

On responsible investment, the investment team is accountable for ESG integration and climate change is one of the most important considerations. Guidelines have been set up to incorporate climate change considerations into financial modelling and investment decisions. The Risk Management team independently oversees the implementation of sustainability and climate risk related policies and monitors progress on a regular basis. The Legal and Compliance team monitors climate change related regulations, such as the Guidelines on Environmental Risk Management ("EnRM") from the Monetary Authority of Singapore ("MAS") and Sustainable Financial Disclosure Regulation ("SFDR") from the European Union, as well as ensure that our processes and practices meet requirements. The Business Development team is responsible for client engagement on sustainability matters and for communicating the firm's sustainability approach. The Marketing, Communications and RFP team promotes climate change knowledge, facilitates internal sharing within Fullerton and external communications of our progress to clients and the general public.

On corporate sustainability, the Business Management and Human Capital teams work together to direct the implementation of the company's corporate sustainability plan. Relevant guidelines, trainings and tools are provided to all employees to reduce the environmental impact from our operations and climate data are recorded for analysis.

Exhibit 1: Sustainability governance structure of Fullerton

Board of Directors

Oversight of Fullerton's sustainability strategy

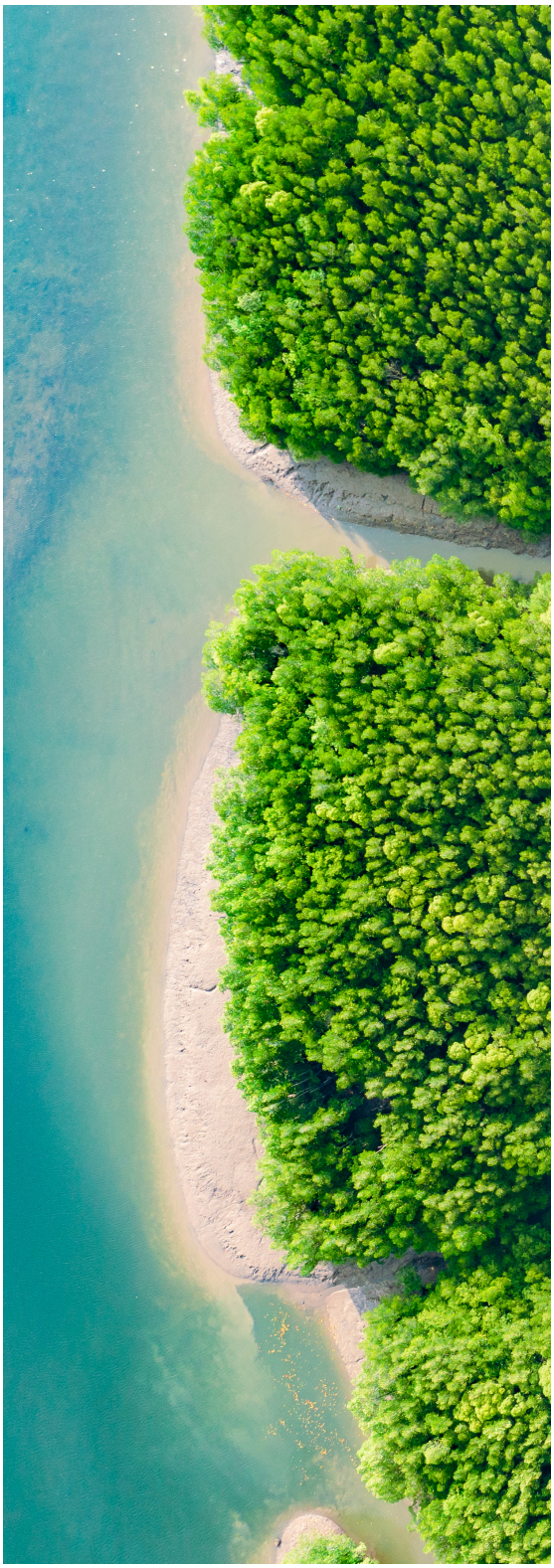
Executive Resource and Compensation Committee	Executive Committee	Audit & Risk Committee
Oversight of the remuneration governance framework	Oversight of the implementation of firm's sustainability strategy	Oversight of sustainability – related risk, compliance and legal issues
• Sustainability is progressively linked to the firm's remuneration framework • Integration of sustainability risk management is part of the appraisal considerations for the Sustainability, Investment, Risk, Legal & Compliance teams	• Sustainability Committee manages and coordinates the implementation of firm-wide sustainability strategy • Sustainability team develops the ESG investment strategies and policies • Partners the Investment team to integrate sustainability into the investment process, and build on the firm's capabilities	• ESG investment risk management is an integral part of Fullerton's Enterprise Risk Management framework • ESG investment risk is primarily managed by the Investment and Sustainability teams, with the Risk team maintaining independent oversight

Strategy

Fullerton views tackling climate-related risks as a key priority. Climate change is a systemic risk that may negatively affect the performance of our clients' investments. We recognise the need to mitigate transition and physical risks in our investments to safeguard clients' long-term financial interests, in a manner that is consistent with their investment objectives.

However, the impact of climate change goes beyond investment performance alone. Stakeholders' expectations of our role in tackling climate change are increasing. More clients are aware of the climate change risks and are concerned about potential financial impact. To minimise risks and drive ESG alpha, clients are more inclined to invest with sustainability considerations in mind. They want to ensure how they are investing meets their core values and reflects their expectations. From the regulatory perspective, regulators from different jurisdictions are mandating climate change risk management and reporting, and introducing more detailed guidelines, in addition to principles.

In this regard, Fullerton has invested in internal capabilities to meet stakeholder demands and to provide the products and services to meet these changing demands. We acquire and generate various climate-related data to better understand the risks and opportunities arising from climate change. We take this data and convert it into scores, footprint reports and insights that are integrated across relevant products and services.



A. Risks and opportunities identified and their impact

To set an effective strategy that carefully takes climate change into consideration, we must understand the risks and opportunities we are facing. There are two categories of risks – transition risks and physical risks. Transition risks are derived from the transitioning process to a lower-carbon economy, and this varies among countries, regions, industries, and development stages. Physical risks can be event driven or caused by longer-term shifts in climate patterns.

To formulate a targeted strategy, we looked into risks and opportunities at both the investment level and the corporate level.

Investment level

The list of climate-related risks and opportunities to our investment management process and their impact can be seen in Table 1 below. Based on the analysis, there will be significant impact on portfolio companies, which would in turn affect investment performance. Therefore, we see climate change as an important consideration in product development, portfolio construction and the overall investment process.

Table 1: Climate related risks and opportunities at the investment level

Risk type		Risks and opportunities description	Impact	Time horizon*	Financial impact	Mitigation strategy
Transition	Policy and Legal	• Mandates or requirements on climate related risks management and metrics reporting on investment level • Carbon pricing mechanism on portfolio companies, which may impact their financial performance • Regulations of products and services, especially funds taxonomy, marketing materials, process management and information disclosure	• Increased data and operational costs to meet requirements • Increased specialised ESG compliance headcount and cost • Increased cost due to compliance with regulations and additional fund/investment relating to carbon assets of portfolio companies • Possible asset write-offs of portfolio companies	Short term	High	• Subscribe to a specialised carbon data provider for company level analysis in portfolios • Start reporting on portfolio level scope 1 and scope 2 carbon emissions intensity • Hire consultants to help us understand how to comply with regulations where appropriate • Conduct internal ESG analysis and engagement to enable Fullerton to be more informed about the risks that portfolio companies face • Assess and gradually incorporate carbon cost into our company financial models for the jurisdictions with high carbon compliance costs
	Market and Reputation	• Stakeholders' concern on the systemic risks related to climate change on investment products and services • Stakeholders' preference for greener products and services with transparent disclosure	• Decreased demand for products and services not considering climate change risks	Short term	High	• Make our investment products more transparent by providing sufficient ESG reporting • Enhance our ESG integration approach and management to avoid 'greenwashing' • Develop and launch ESG products to meet shifting appetites • Extend the engagements with portfolio companies to disclose and manage climate related risks
	Technology	• Portfolio companies' use of more energy efficient technologies • Portfolio companies' shift towards use of renewable energy • Portfolio companies' shift towards a more sustainable product mix	• Reduced operating costs from portfolio companies due to energy saving and self-generated renewable power • Better competitive position in the market and increasing revenue of portfolio companies	Short term	High	• Subscribe to specialised ESG datasets for impact and enhance ESG integration across portfolios to understand the financial impact from technological and innovation perspective • Develop and launch specialised ESG funds on technology utilisation and innovation • Seek out leaders in the low carbon transition space by conducting company level ESG analysis and engagement, as well as ESG thematic research

* Short term - within five years; medium term - five to ten years; long term - more than ten years.

Risk type		Risks and opportunities description	Impact	Time horizon*	Financial impact	Mitigation strategy
Physical	Acute	• Increased occurrence of extreme weather events	• Disrupt operations of portfolio companies	Short-to-medium term	Medium	• Engage with selected high-emitting companies and companies with material climate-related risks
	Chronic	• Longer-term shifts in climate patterns such as rising temperatures • Rising sea levels	• Disrupted access to water and food and thus affecting employee health and productivity of portfolio companies • Possibility of choosing new locations for business operation of portfolio companies	Long term	Low	• Engage with selected high-emitting companies and companies with material climate-related risks

* Short term - within five years; medium term - five to ten years; long term - more than ten years.

From our analysis of the risks and impact, we further identified the exact impact on each of the portfolio companies to assist in our investment decisions. We have already started to integrate ESG considerations, especially climate change impact in our valuation models, based on our in-depth assessment and engagement with companies. We are further exploring how to better quantify the impact from climate change for high-emitting industries.

Corporate level

The list of climate-related risks and opportunities to our operations and their impact can be seen in Table 2 below. Overall, transition risks are likely to increase our operational cost in the short term and physical risks impact our contingency work plans in the long term.

Table 2: Climate related risks and opportunities at the corporate level

Risk type		Risks and opportunities description	Impact	Time horizon*	Financial impact	Mitigation strategy
Transition	Policy and Legal	• Mequirements on climate related risks management and metrics reporting at the corporate level • Regulations of fund management	• Increased data and operational costs to meet requirements • Increased specialised ESG compliance headcount and cost • Possible asset write-offs • Possible accelerating retirement of existing funds	Short term	High	• Internal corporate level climate reporting has started since 2020 and is published publicly since 2022 via the TCFD report • Keep abreast of ESG related regulations and developments in markets that may be relevant to our firm and funds offered and be part of Singapore industry consultations to reflect our suggestions and get better understanding of t he regulations • Hire consultants to help us understand how to comply with regulations where appropriate • Explore datasets needed to comply with regulations
	Market and Reputation	• Stakeholders' concern on the climate change impact on operations • Stakeholders' willingness to collaborate with greener institutions with high environmental awareness and ethical standards	• Decreased Asset under management ("AUM") if we fail to assure stakeholders of our climate related commitment and ability to mitigate climate change risks	Short term	High	• Set action plan to reduce carbon footprint on the operational level • Offset operational GHG emissions since 2020 • Released Sustainable Procurement Policy and collaborate with key vendors to reduce carbon footprint on supply chain
	Technology	• Use of more energy efficient technologies • Use of low-carbon economy technologies	• Reduced operating costs on energy use • Reduced need for travel and relevant expenses	Short term	Medium	• Encourage technologies, equipment and behaviour with low carbon emissions • Use virtual meeting platforms and tools; actively monitor and reduce need for travel
Physical	Acute	• Increased occurrence of extreme weather events	• Disrupted internet connectivity due to damage on infrastructure • Diminished ability for employees to work if offices, residences or transportation are hit	Short-to-medium term	Medium	• Design remote working contingency plan
	Chronic	• Longer-term shifts in climate patterns such as rising temperatures • Rising sea levels	• Affect access to water and food and thus affecting employee health and productivity • Possibility of choosing new office locations	Long term	Low	• Conduct risk assessment for choosing office location

* Short term - within five years; medium term - five to ten years; long term - more than ten years.

We monitor the latest regulatory requirements and stakeholders' expectations on environmental related issues on an on-going basis. We conduct research to better assess and manage how climate-related risks impact our business operations. The learnings from the monitoring and research are reflected in the operational process and we enhance our strategy and action plans accordingly. At the operational level, we purchased carbon credits to offset our carbon emissions. For example, we purchased carbon credits funding projects of clean cookstoves for the Mamize nature reserve with WWF and Vietstar sustainable waste treatment, to offset the carbon emissions for 2021. Both projects were certified as Gold Standard Voluntary Emissions Reduction. For 2022, we purchased carbon credits funding projects of Laizhou landfill gas power, which was certified as verified carbon units (VCU).

B. Scenario analysis and climate resilience

Scenario analysis

We view scenario analysis as a means to assess climate risks for our total portfolio. We selected three scenarios for the analysis, based on Network for Greening the Financial System (NGFS) climate scenarios. NGFS framework covers six scenarios under three categories, namely hot house world, disorderly and orderly. We chose one scenario from each category to reflect the impact from a broad range of physical and transition risks. The scenarios selected are Nationally Determined Contributions, which includes all pledged policies even if they are not yet implemented (hot house world), Delayed Transition which assumes global annual emissions do not decrease until 2030. Strong policies are then needed to limit warming to below 2 °C (disorderly), and Net Zero 2050 (orderly). Net Zero 2050 scenario is aligned with the Paris Agreement's goal of limiting global warming to well below 2 degrees Celsius, preferably to 1.5 degrees Celsius, compared to pre-industrial levels.

To better assess the potential impact, we have updated our methodology for climate risk scenario analysis this year. Last year, we focused on quantifiable transition risks, especially policy based on carbon price. We now include both physical and transition risks to reflect a more comprehensive and dynamic impact on portfolio companies. In terms of the analysis scope, we used our actual AUM as of December 2022, instead of the representative universe used last year. Hence, we are able to better understand the actual impact on our investments. We also specifically assess the impact on different asset classes and industries.

Overall, the current value impact[1] under each scenario considered is limited. The value impact for equity and corporate bonds is within -5% by 2050. The value impact for sovereigns is within 10% by 2050 scenarios. Sector-wise, energy is the most negatively impacted sector, while real estate and utilities can be positively impacted.

We identified 21 high emissions sub-industries, and the value impact varies greatly among them. Traditional energy related sub-industries such as oil & gas storage and transportation see significant negative financial impact in both the short-term and long-term whereas renewable energy and equipment related sub-industries such as renewables IPP and diversified metals & mining companies with exposure to green minerals, stand to benefit.

For more details of the approach to climate risk scenario analysis and key conclusions, please refer to the Appendix.

We have started to incorporate the results of scenario analysis in the valuation process for Equities since 2021 with special emphasis on the high emissions industries. We explore how physical risks, adaption, demand creation, demand destruction, direct carbon costs, abatement, market impacts, etc. will impact the value of the companies. We will review and update the results of the scenario analysis and continuously improve and refine the way we incorporate the results in our investment and corporate strategy in the coming years. The results also feed into the thematic engagement for climate change with our portfolio companies. We will focus more on the companies with greater value impact and understand how they plan to effectively manage climate risks. The updates to the scenario analysis and strategy incorporation are reviewed by the Audit & Risk Committee.

1 Value impact refers to the percentage change in net present value for the portfolio under each selected scenario by 2050.

Climate resilience and follow up actions

To assess risks more comprehensively and to identify opportunities for alpha generation, we adopt an ESG integration approach in our investment process. For each portfolio company, the investment team determines material issues based on our proprietary framework and our understanding of the industry and the company. The team continuously tracks and measures the ESG progress made by portfolio companies according to publicly disclosed information and learnings from engagements. The analysis is integrated to financial models and portfolio construction to reflect our consideration of ESG factors. We also seek to effect positive change and influence among the portfolio companies. Specifically, we will share the trends we observe and industry best practices with the companies during the engagement process and ask if they have clear transition plans. We also ask portfolio companies regarding their consideration of the balance of economic returns and transition journey and request that they disclose their progress. We are pleased to see that some companies have disclosed their targets and transition roadmap and released relevant reports on their progress.

To enhance our ESG integration capabilities and improve our resilience, we are focusing on five key areas.

Table 3: Key areas to improve climate resilience

Focus	Objective	Actions
Investment Research	• Provide climate related research and data across all asset classes • Investment integration of potential impacts to investment decisions	• Carbon data • Climate change metric inputs into valuations • Thematic research
Active Ownership	• Understand portfolio companies' exposure and management of climate change issues • Encourage disclosure and better climate change risk management	• Regular engagement with companies on climate change including collaborative engagement with AIGCC and Climate Action 100+ • Released Active Ownership Policy. Climate change is one of the themes in the thematic engagements • Conducted >150 company engagements in 2022
Portfolio Construction	• Understand climate risk reward trade off and incorporate climate change risks in portfolio construction	• Portfolio level carbon footprint
Industry Collaboration	• Collaborate with industry associations and participate in industry initiatives	• Founding member of Singapore Green Finance Centre • Member of AIGCC & Climate Action 100+
ESG Reporting and Disclosure	• Transparent disclosure to clients and regulators	• ESG client reports made available (including carbon intensity metrics) • In-depth discussion with clients and key stakeholders on the targets and plans for climate risk management and decarbonisation • TCFD report

Investment research

We aim to further provide climate-related research and data across all asset classes to help integrate potential impact to investment decisions. To do so, we will take carbon data into consideration and incorporate climate change metrics into valuations. We have already included climate related metrics, such as carbon emissions of companies' own operations, environmental impact of their products and services, climate resilience as part of our internal ESG rating system. We plan to incorporate the risk analysis into financial modelling. We will also conduct further ESG thematic research to explore investment opportunities.

Active ownership

We have released our Active Ownership Policy in 2022, which details our approach on engagement and proxy voting. In terms of engagement, we carry out two types of corporate engagement: (1) value creation engagement and (2) controversies engagement. Through our engagement with companies, we seek to promote positive long-term performance of the company and enhance the quality of investments for our clients. Value creation engagement is a proactive approach focusing on long-term, financially material ESG opportunities and risks that can affect companies' valuation and ability to create value. Climate change is one of the focus areas in value creation engagement, especially for high emissions sub-industries that have financial materiality related to climate risks. We specifically conduct thematic engagement with companies that have the highest exposure to climate change. Controversies engagement focuses on companies that severely and structurally breach minimum behavioural norms in areas such as the UN Global Compact principles. Environmental controversies are one of the areas we monitor on our watchlist.

We aim to understand portfolio companies' exposure and management of climate change issues as well as encourage better disclosure and climate change risk management. Therefore, we will continue to conduct regular engagements with companies on climate change, either on our own or in collaboration with other asset managers, initiatives or groups. We have urged companies to evaluate climate risks and impact using the TCFD framework whenever applicable. We have also discussed with companies about their plans to mitigate climate risks and to identify opportunities.

Portfolio construction

We aim to understand climate risk reward trade-offs and incorporate climate change risks in portfolio construction. We will continue to calculate portfolio level carbon footprints and monitor the trends. We will also further analyse the performance compared with the benchmark or broad market index and monitor the changes in market preference. More explicit rules will be set for funds that promote environmental or social characteristics.

Industry collaboration

We aim to collaborate with industry associations and participate in industry initiatives. We are a founding member of the Singapore Green Finance Centre and a member of Asia Investor Group on Climate Change (AIGCC) and Climate Action 100+ (CA 100+). We are the lead in several group engagement efforts with a Chinese coal-based diversified energy provider, and are collaborating actively with other investors to engage with a Korean energy and chemical company as part of the Climate Action 100+ initiative.

ESG reporting and disclosure

We aim to be transparent in disclosing climate related information to regulators and clients. We adhere to the Guidelines of Environmental Risk Management from the MAS and this is the second publication of our TCFD report. ESG client reports including carbon intensity metrics are made available to clients upon request. We have also discussed with key clients and stakeholders on the targets and plans for climate risk management and decarbonisation.

Risk Management

Climate change risks are monitored as part of our risk management strategy and process. There are three lines of defence in our risk management approach. The first line is the business units – Investment teams and the Business Management teams – which evaluate and manage the risks and opportunities inherent in our day-to-day business. In the second line, the Risk Management team independently oversees the implementation of ESG and climate risk related policies, including challenging practices and assumptions, and monitors progress on a regular basis. The Compliance team ensures that Fullerton is in compliance with regulatory requirements at both the investment and corporate level. The third line is internal audit, which independently assesses adequacy and effectiveness of internal controls and to provide assurance to Fullerton's Board of Directors and Executive Committee on the effectiveness of the internal controls. It also assesses the robustness of the risk management framework in managing ESG and environmental related risks, to ensure that relevant risks are properly controlled within an acceptable level.

For climate change risks at the investment level, the investment teams are responsible for identifying potential risks, with support from the Sustainability team. We rate all the securities in our Funds with an ESG rating using our proprietary framework which is applied across our investment universe. As part of the fundamental research process, we assess companies' exposure to material ESG issues, including climate change related issues. We assign each investee company an ESG rating that reflects the degree to which these ESG issues are managed by the investee company. Third-party data resource and analysis tools are provided to help the investment teams to consistently assess all the ESG issues that are material to the companies that Fullerton invests in.

The rating process is supplemented with active engagement with select companies in the portfolio. The aim is to influence corporate behaviour in the management of their material ESG issues, particularly where improvements in policies, practices and disclosure are expected to enhance and protect shareholder value. Prioritisation of engagement is based on the materiality of the issues identified through ESG research. In particular, we hold the view that climate change represents a systemic risk, and we engage with companies to understand their management of climate risk and progress under the TCFD guidelines, and to encourage improvements. For instance, if an investee company agrees to report under the TCFD guidelines, we could reflect this positive development by upgrading the ESG rating assigned to the company. For the investment in Asian markets, where the energy mix is heavily tilted to fossil fuels (including thermal coal), we aim to engage systematically with portfolio companies with a significant involvement in the production and/or use of thermal coal (i.e., companies with a revenue or ownership exposure equal or above a certain threshold). We expect these companies to define, implement and disclose credible plans to transition to less carbon intensive business models in alignment with their country of operation's climate reduction targets.

Portfolio limits are applied on securities with low rated ESG scores, which are calibrated based on the level of the score. These rules are designed to limit the exposure of the fund to companies with a high level of ESG risk and to exclude companies with severe ESG risk. Risk Management team monitors these exposures on a regular basis and provides reports to the Risk & Compliance Committee and the Board level Audit and Risk Committee, periodically. For investment portfolios, Risk team also reports firm wide ESG scores and carbon intensity to the Risk & Compliance Committee & Audit Risk Committee.

Fullerton's ESG policies and procedures mentioned above are embedded in the overall investment management process and are audited by our internal auditor, with effect from 2021.

For climate change risks at the corporate level, the Sustainability team, Compliance team and Risk Management team work collaboratively to monitor the latest regulatory requirements on the management and reporting of ESG and environmental risks. They also make joint efforts to ensure relevant procedures and approaches are adopted to meet the requirements. Material environmental risks will be raised to the Executive Committee for discussion and review if necessary. For market, reputation, technology and physical risks, the Sustainability team and Business Management teams work together to monitor the carbon footprint at the operational level and will design action plans to meet internal targets.

Metrics & Targets

Based on our ESG strategies and plans, we use several metrics to measure our progress in managing climate change risks, and we set annual targets for these metrics. We are evaluating the feasibility of setting a decarbonisation target in the long term based on the results of our climate scenario analysis and the carbon footprint analysis. We plan to first focus on high-emitting industries and industries that are most impacted by climate risks and opportunities.

A. Investment level

At the investment level, we continuously enhance our ESG integration framework and stewardship efforts. By the end of 2022, we have two ESG alpha funds and one sustainability-related bond mandate. We will further explore the sustainability and climate related opportunities in both public and private market. We have calculated the portfolio level carbon footprint for clients upon request and will put more focus on high-emitting industries. The metrics and targets on investment level are shown below.

Table 4: Metrics for climate change risk management on investment level

Metrics	Achievements in 2022	2023 Target
ESG integrated AUM	Cover Equities and Fixed Income by end of 2022	Develop and enhance ESG framework for private markets
Engagements on climate change	Achieved engagement with around 150 companies including on the discussion of climate change	Climate change as one of the three key engagement themes and progress will be recorded. Priorities will be given to high-emitting industries

ESG integrated AUM	refers to the portfolios adopting ESG integration approach as mentioned in the Risk Management section
Engagements on climate change	refer to the engagements with question involving climate change issues with investee companies. Key emphases are on companies' decarbonisation plans, efforts, progress and achievements. We also assess the credibility of companies' commitment on their mid to long term climate targets and hold companies to account for their 2030 or 2050 roadmap. Priorities will be given to high-emitting industries and companies with material climate-related risks

B. Corporate level

At the corporate level, we have been carbon neutral in our operations since 2020. We will continue to be carbon neutral by offsetting our carbon emissions in 2022. We will further explore the areas with the largest manageable Scope 3 GHG emissions and design a roadmap for reduction.

We have accounted for our carbon emissions on operations since 2019 and have tracked the changes to identify potential areas for improvements. Relevant methodology and emission factors are used in line with the GHG Protocol. The reporting scope included the Singapore office and China (Shanghai) office as they are the main countries we have business operations in. For Scope 2 emissions, we have seen a slight increase from 2021 to 2022, because we have more employees in 2022.

For Scope 3 emissions (all other indirect emissions that occur in a company's value chain), we measure fuel and energy-related activities, business travel and employee commuting currently and will look to expand the scope as relevant data becomes more reliable with a more mature accounting methodology. Business travel had increased significantly from 2021 to 2022 because mobility restrictions and quarantine policies due to COVID-19 were loosened and we embarked on our business expansion to different geographies. Employee commuting had increased as well, partly because more employees started returning to office in 2022, and in part due to the growth in staff headcount.

We have also reviewed other relevant Scope 3 categories, including purchased goods and services, capital goods and waste generated. We plan to review these data and calculation methodology in more detail to provide more credible and meaningful information in the next few years. To reduce our carbon footprint along the supply chain, we have released the Sustainable Procurement Policy in 2022 to set out guiding principles on sustainability in procurement and key supplier selection, management and monitoring. All key suppliers and outsourced services providers need to go through the ESG due diligence before onboarding and we have reached out to our existing key vendors to conduct the ESG due diligence. As part of the due diligence, vendors are asked if they have environmental management processes as well as relevant targets, plans, programs, measurement and monitoring, and if they have voluntary reporting related to the environment which follows international standards, such as the TCFD framework.

In terms of carbon intensity, the GHG emissions per full time employee (FTE) increased by 19.11%, mainly due to COVID-19 and its impact on business travel and employee commuting.

We also plan to disclose our progress on more metrics such as water and waste management in the future.

Table 5: Absolute GHG emissions on the corporate level

Scope	Categories	GHG emissions (tCO2e)		
		2020	2021	2022
Scope 1		Not applicable	Not applicable	Not applicable
Scope 2	Purchased electricity	85.73	85.08	87.11
	Heating and cooling	1.34	1.21	1.31
Scope 3	Fuel and energy-related activities	16.24	24.77	25.51
	Business travel	33.41	40.25	103.27
	Employee commuting	14.40	35.76	47.70
Total		151.12	187.07	264.90

Table 6: GHG emissions intensity on corporate level

Scope	Categories	GHG emissions intensity (kgCO2e / FTE)		
		2020	2021	2022
Scope 1		Not applicable	Not applicable	Not applicable
Scope 2	Purchased electricity	476.28	472.67	407.06
	Heating and cooling	7.44	6.72	6.12
Scope 3	Fuel and energy-related activities	90.22	137.61	119.21
	Business travel	85.61	223.61	482.57
	Employee commuting	80.00	198.67	222.90
Total		839.56	1,039.28	1,237.85

Table 7: Scope, methodology, data used and emission factor source of GHG accounting

	Scope	Methodology	Data used	Emission factor source
Scope 2	Indirect emissions from the generation of purchased electricity and cooling consumed by the company	• Purchased electricity: tCO2e=∑(Total energy consumed (kWh) * Relevant grid emissions factor per unit (kgCO2e/kWh) / 1000) • Cooling: tCO2e=∑(Total cooling consumed (kWh) * Efficiency ((kW electricity) / kWcooling) Relevant emissions factor per unit (kgCO2e /kWh) / 1000)	• Activity data (for example, electricity and cooling consumption) • National/state/ region-level emissions factors	• Singapore: Energy Market Authority (EMA) • Shanghai: Institute for Global Environmental Strategies (IGEA) – East China Power Grid
Scope 3 - fuel and energy-related activities	Fuel and energy-related activities Indirect GHG emissions from well-to-tank and transmission and distributed losses from generation and upstream	• From electricity tCO2e=∑(Total electricity consumed (kWh) * Emission factor for WTT / 1000) + ∑(Total electricity consumed (kWh) * Emission factor for WTT for T&D losses / 1000) + ∑ (Total electricity consumed (kWh) * (Grid losses %) / ((100-grid losses %)) * Relevant grid emission factor per unit (kgCO2e / kWh) / 1000) • From cooling tCO2e = Emissions of fuel and energy-related activities from electricity * Efficiency ((kW electricity) / kWcooling)	• Activity data (for example, cooling consumption) • National/state/ region-level emissions factors	• T&D loss rates by country: World Bank database • WTT and T&D: UK Department for Environment, Food & Rural Affairs (DEFRA) 2021
Scope 3 - business travel	Indirect GHG emissions from the transportation of employees for business-related activities in vehicles owned or operated by third parties, such as aircraft, trains and passenger cars, and accommodation	• Transportation tCO2e=∑(Total distance travelled (km) * Relevant vehicle type emissions factor per unit (kgCO2e / km) / 1000) * For aircraft, the emission factor is further decided by flight type (short, medium, long haul) and cabin (economy, first-class) • Accommodation tCO2e=∑(Total number of hotel nights (night) * Relevant hotel emissions factor per unit by country (kgCO2e / night) / 1000)	• Activity data: ○ Air travel: distance travelled; cabin or class ○ Land travel: distance travelled; vehicle type • National emissions factors	• UK Department for Environment, Food & Rural Affairs (DEFRA) 2021
Scope 3 - employee commuting	Indirect GHG emissions from the transportation of employees from home to office and vice versa, such as train / metro, car, bus, motorcycle	• Transportation tCO2e=∑(Total distance travelled (km) * Relevant vehicle type emissions factor per unit (kgCO2e / km) / 1000)	• Activity data: distance travelled; vehicle type • National emissions factors	• UK Department for Environment, Food & Rural Affairs (DEFRA) 2021

Exhibit 2: GHG emissions by categories at the corporate level

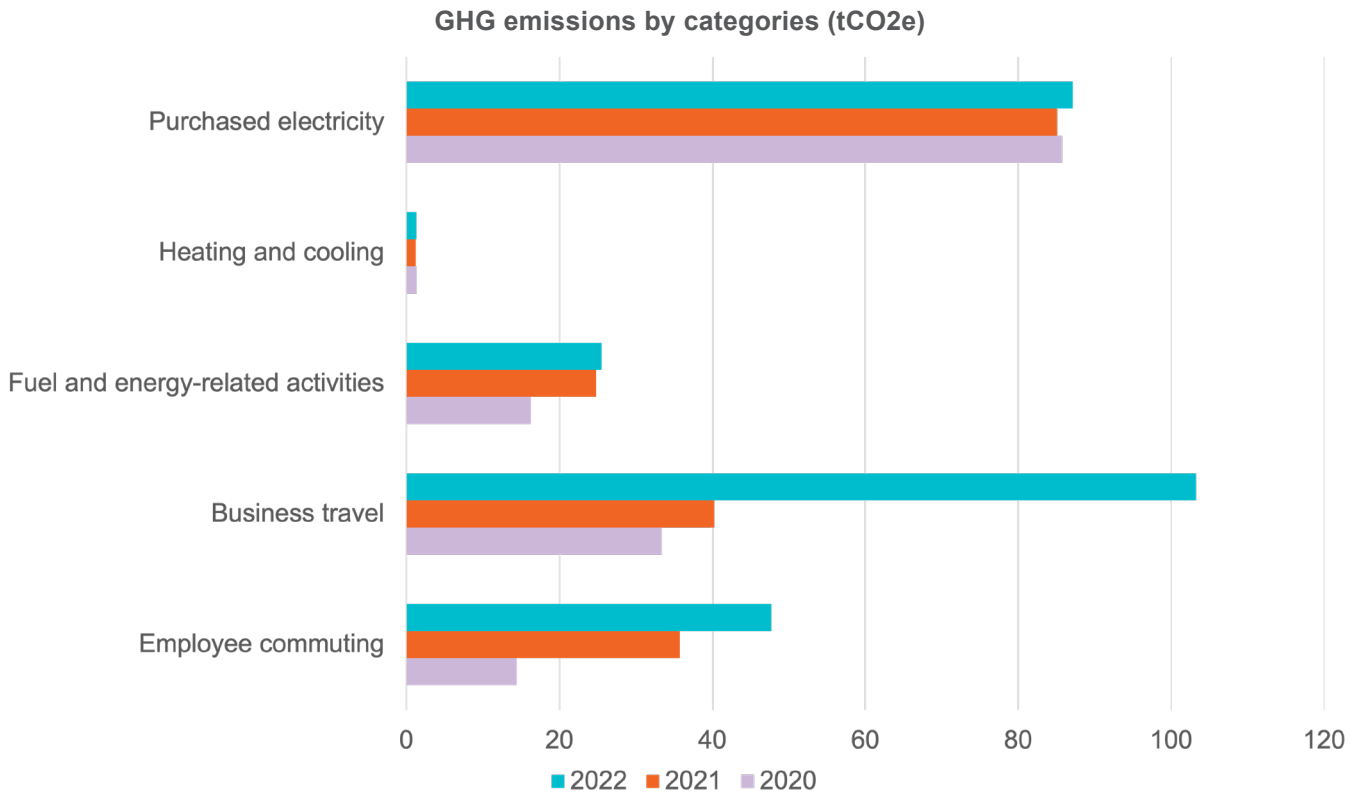
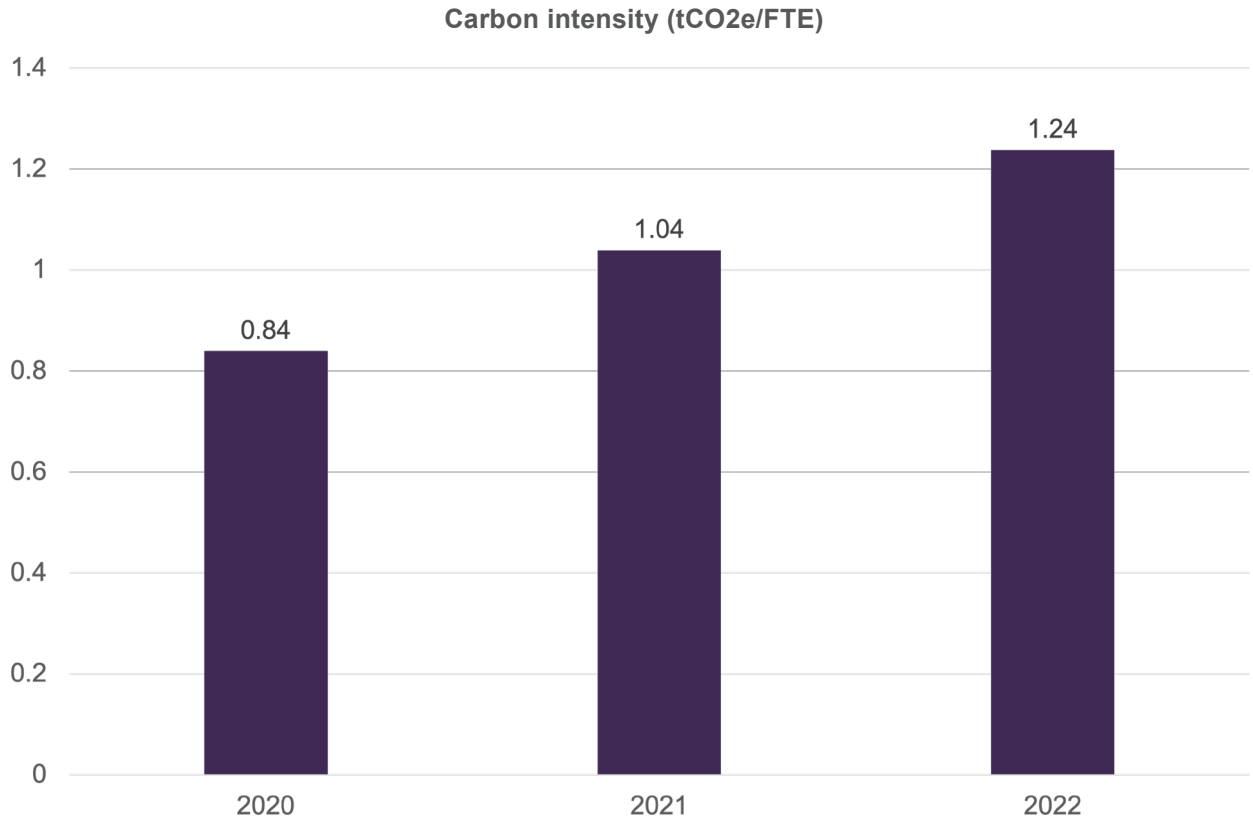


Exhibit 3: Carbon intensity trend at the corporate level

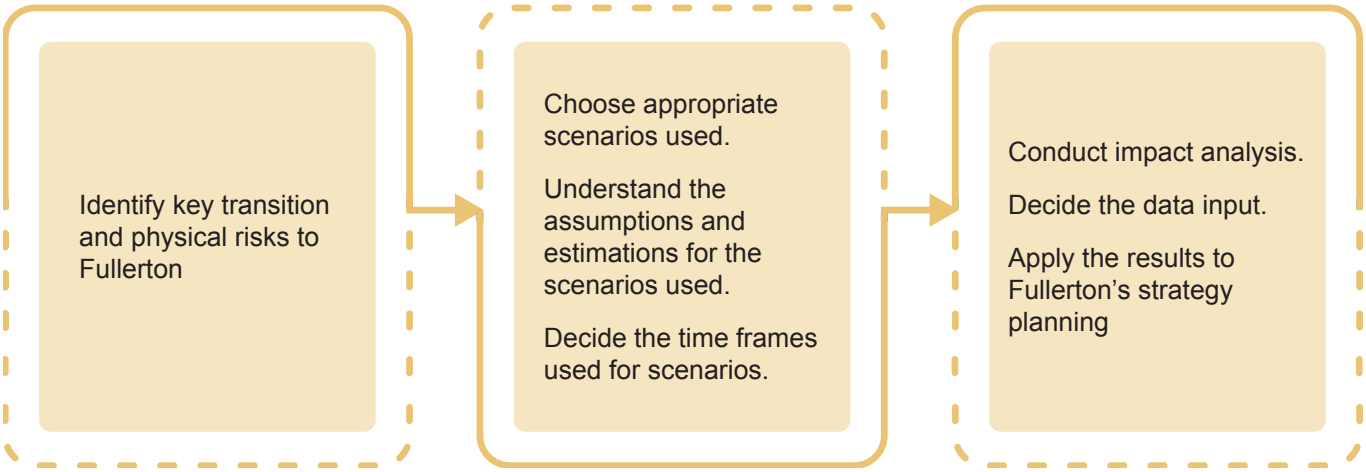


Appendix: Climate Risk Scenario Analysis

We have conducted our second official climate risk scenario analysis to better understand the risks we are facing and to provide a reference point for climate related strategy development. Compared with the first scenario analysis, we have updated our methodology, risk considerations, scenario chosen, analysis scope and granularity of analysis. We will evolve our approach and methodology as more accurate data and scenarios, coupled with more mature methodologies and analysis tools become available.

Overview of process

We took the following steps for the climate risk scenario analysis.



Identify key risks

As mentioned in the Strategy section, we have identified both transition risks and physical risks at the corporate level and investment level. To better understand the risks involved and their impact on our business operations and portfolios, we have adopted a more comprehensive methodology this year, which includes both transition risk and physical risk in the analysis.

Choice of scenario used

This year, we have chosen NGFS set of scenarios for our analysis. NGFS scenarios provide key physical and transition scenario parameters required for the modelling and are widely used by central banks and the financial sector for climate stress testing.

According to NGFS, there are three main categories (except for "too little, too late" which is out of the scope of discussion), and each has two scenarios. Below are definitions by the NGFS:

> "Hot house world scenarios assume that some climate policies are implemented in some jurisdictions, but global efforts are insufficient to halt significant global warming. Critical temperature thresholds are exceeded, leading to severe physical risks and irreversible impacts like sea-level rise.
>
> Disorderly scenarios explore higher transition risk due to policies being delayed or divergent across countries and sectors. Carbon prices are typically higher for a given temperature outcome.
>
> Orderly scenarios assume climate policies are introduced early and become gradually more stringent. Both physical and transition risks are relatively subdued." [2]

To understand the impact under each category, we have chosen one scenario from each one. The details of the scenarios and key assumptions are listed below.

> "Hot house world – NDCs: Nationally Determined Contributions (NDCs) includes all pledged policies even if not yet implemented. This scenario assumes that the moderate and heterogeneous climate ambition reflected in the conditional NDCs at the beginning of 2021 continues over the 21st century (low transition risks). Emissions decline but lead nonetheless to 2.6 °C of warming associated with moderate to severe physical risks. Transition risks are relatively low.
>
> Disorderly – Delayed transition: Delayed Transition assumes global annual emissions do not decrease until 2030. Strong policies are then needed to limit warming to below 2 °C. Negative emissions are limited. This scenario assumes new climate policies are not introduced until 2030 and the level of action differs across countries and regions based on currently implemented policies, leading to a "fossil recovery" out of the economic crisis brought about by COVID-19. The availability of CDR technologies is assumed to be low pushing carbon prices higher than in Net Zero 2050. As a result, emissions exceed the carbon budget temporarily and decline more rapidly than in Well-below 2 °C after 2030 to ensure a 67 % chance of limiting global warming to below 2 °C. This leads to both higher transition and physical risks than the Net Zero 2050 and Below 2 °C scenarios.
>
> Orderly – Net zero 2050: Net Zero 2050 ¬is an ambitious scenario that limits global warming to 1.5 °C through stringent climate policies and innovation, reaching net zero CO_2 emissions around 2050. This scenario assumes that ambitious climate policies are introduced immediately. CDR is used to accelerate the decarbonisation but kept to the minimum possible and broadly in line with sustainable levels of bioenergy production. Net CO_2 emissions reach zero around 2050, giving at least a 50 % chance of limiting global warming to below 1.5 °C by the end of the century, with no or low overshoot (< 0.1 °C) of 1.5 °C in earlier years. Physical risks are relatively low but transition risks are high." [3]

We refer to a third-party data vendor for a dataset for the modelling. The data vendor uses asset-class specific methodologies to translate asset-level changes in value streams into changes in security values.

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2 Definition and explanation from NGFS Scenarios Portal.

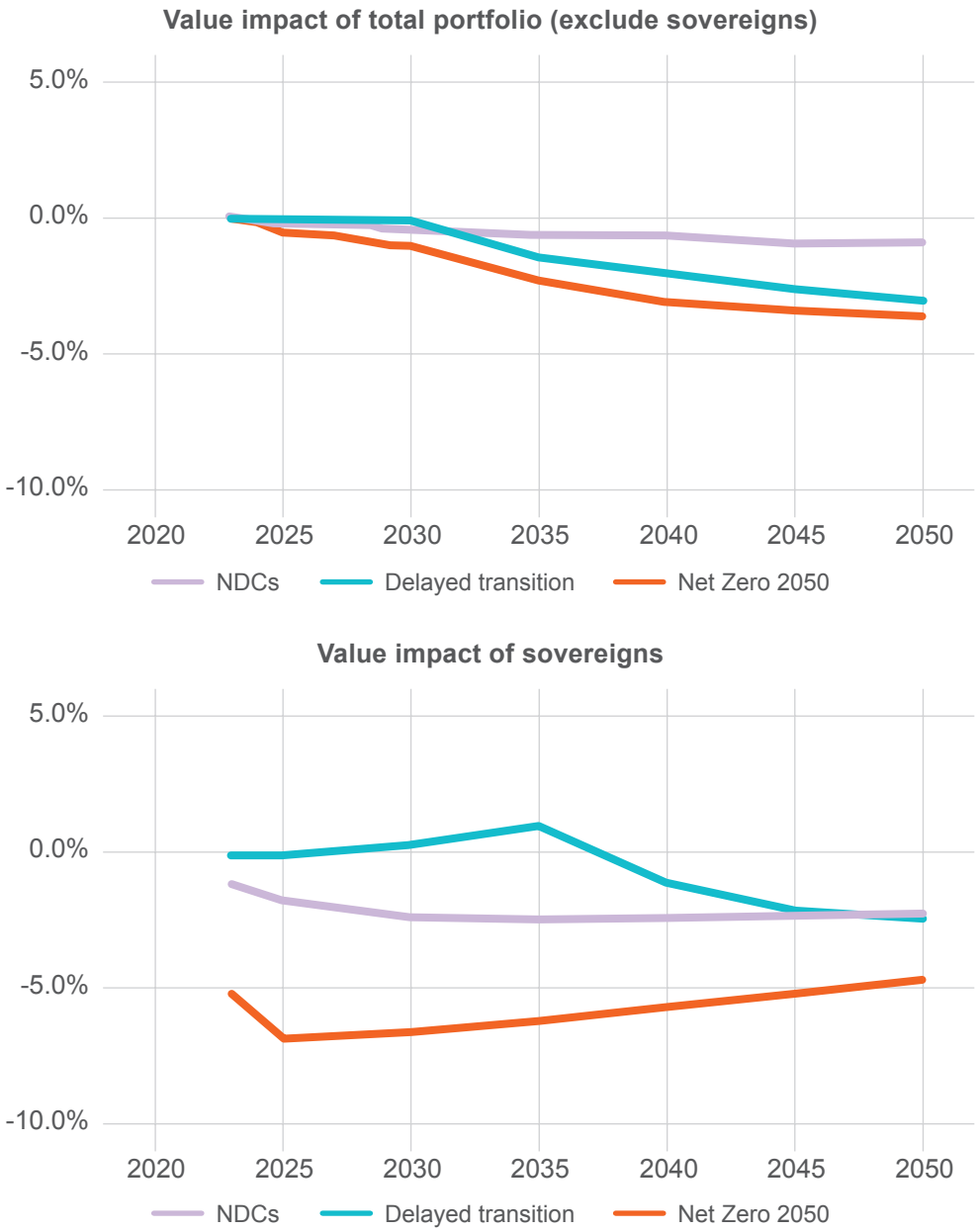
3 Details and assumptions from NGFS Scenarios Portal.

Conducting impact analysis

We used our actual firmwide holdings as of 30 December 2022 to conduct the impact analysis. We identified and assessed the impact of 21 high emissions sub-industries with the highest scope 1 and scope 2 carbon intensity.

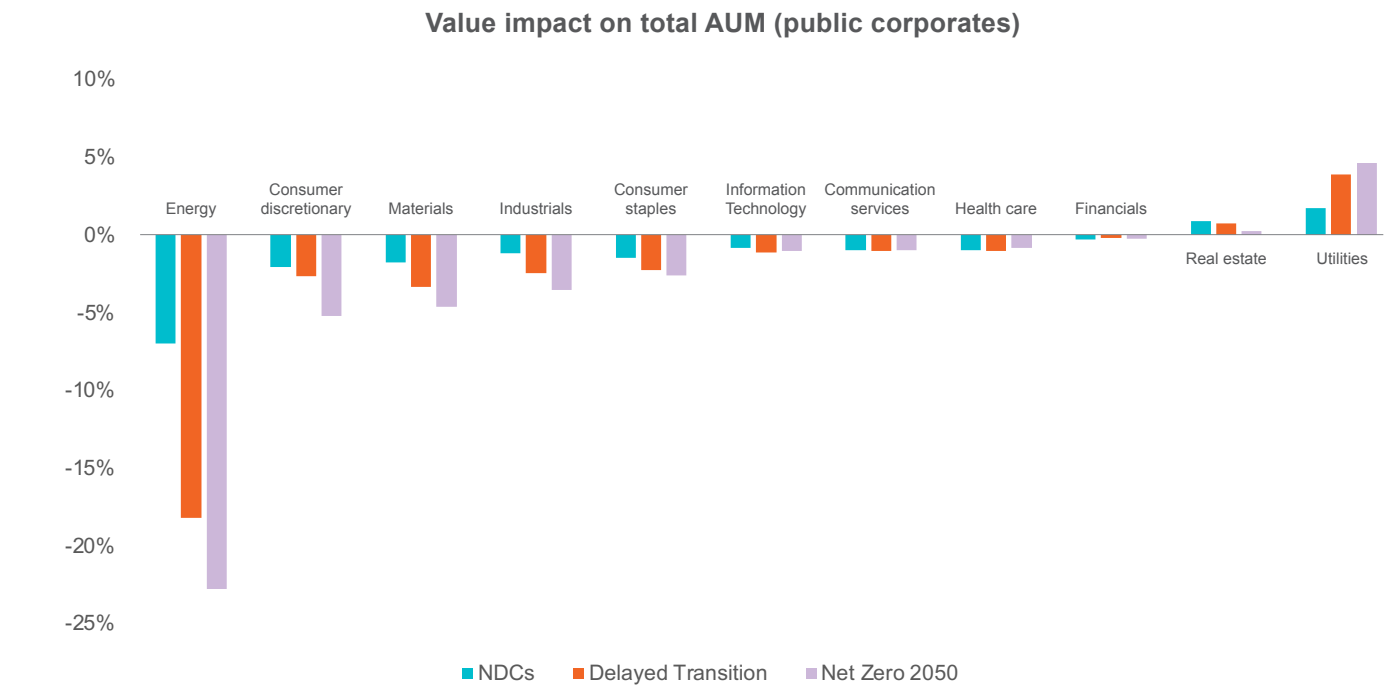
Overall, the portfolio impact under all scenarios is limited. For equity and fixed income (excluding sovereigns), the value impact is within -5% by 2050. For sovereigns, the value impact is slightly higher, especially under net zero 2050 scenarios. However, under the delayed transition scenario, the sovereigns can benefit before 2035 when countries start to take action. Longer duration bonds have a much more negative impact. Physical and transition risks worsen over time and impact the GDP of countries in the long run.

Exhibit 4: Value impact for corporates and sovereigns by 2050



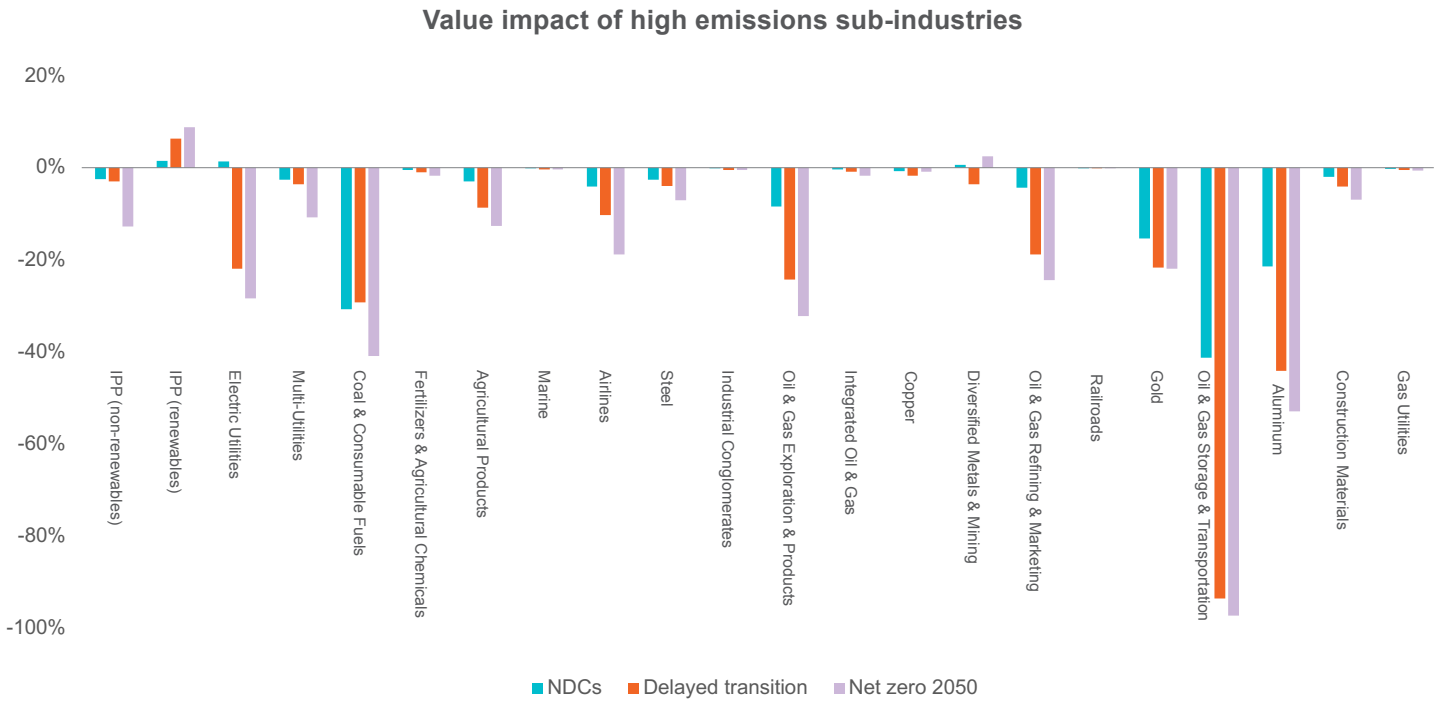
When looking at the sectors, energy is the most negatively impacted sector, while real estate and utilities can be positively impacted. The main reason is that we have already considered ESG risks and opportunities when we analyse the companies and prefer those that are greener. For real estate, the companies and REITs we invested in have more commitments and actions on green buildings. For utilities, we invest in more renewables and companies with transition plans.

Exhibit 5: Value impact by sector by 2050



In particular, we looked into 21 high emissions sub-industries. All these sub-industries are included in the EU Emissions Trading System (EU ETS). The value impact is very large for certain sub-industries such as oil & gas storage and transportation, while minimal for some others such as marine, industrial conglomerates, railroads, etc. The only two high emission sub-industries with positive impact under net zero 2050 scenario are IPP (renewables) and diversified metals & mining. This is because renewable IPPs are in line with the decarbonisation trajectory and many diversified metals & mining companies have business exposure to green minerals such as copper, nickel, cobalt, and lithium.

Exhibit 6: Value impact of high emissions sub-industries by 2050



For the short-term to mid-term, we analyse the value impact under NDCs and net zero 2050 scenarios. We did not include the delayed transition scenario because it assumes very limited policy reaction before 2030. Since policy and legal risks are one of the most important transition risks that will impact financial value, most sub-industries are expected to have minimum impact or positive impact under this scenario. The high emissions sub-industries with value increases and sharp decreases are listed below. The results will serve as the basis for further risk management focus and the identifying of opportunities.

Table 8: Risks and opportunities for high emissions sub-industries in short-term and mid-term

Scenarios	Short-term (now-2025)		Mid-term (2025-2030)	
Change Direction	Decrease (sharply) - Risk	Increase - Opportunity	Decrease (sharply) - Risk	Increase - Opportunity
NDCs	• Coal & consumable fuels • Oil & gas storage & transportation • Aluminum	• Electric utilities • IPP (renewables) • Diversified metals & mining • Industrial conglomerates		• IPP (renewables) • Diversified metals & mining • Agricultural products • Industrial conglomerates
Net Zero 2050	• Oil & gas storage & transportation • Aluminum • Coal & consumable fuels • Airlines	• IPP (renewables) • Diversified metals & mining • Industrial conglomerates	• Oil & gas storage & transportation • Oil & gas exploration & products	• IPP (renewables) • Diversified metals & mining • Agricultural products • Copper • Industrial conglomerates

Limitation of the analysis

Based on the nature of the scenario analysis, the exercise is hypothetical and subject to uncertainties and limitations. It relies on a snapshot of external drivers and is a simplified model which focuses only on the most important and quantifiable parts. For example, the policy and target change, as well as carbon price of relevant countries are not reflected in real-time. The decarbonisation targets set by individual companies are not consistent. We will take similar issues into consideration in the future and will continue to evolve our scenario analysis with the use of more mature methodologies and tools.