



MUFG Asset Management
Climate & Nature Report
2024



Mitsubishi UFJ Trust and Banking

Contents

03	Introduction
04	Executive Summary
05	Overview of MUFG AM Sustainable Investment

1. Climate Change

07	(1) MUFG AM Portfolio analysis
21	(2) Approach to realization of transition plan
22	(3) Analysis of key 4 sectors by our analysts
26	(4) LCA analysis and engagement plans

2. Natural Capital and Biodiversity

28	(1) Integrating climate and nature
32	(2) Roles fulfilled by financial institutions
35	(3) MUFG AM's future initiatives
37	(4) MUFG AM Portfolio analysis

3. Engagement

45	(1) Overall picture of engagement activities
46	(2) Thematic engagement
49	(3) Collaborative engagement
50	(4) Public engagement

4. Governance and Risk Management

5. Appendix

54	(1) Correspondence table for disclosure items in the report and TCFD/TNFD disclosure requirements
55	(2) Analysis of sub-sectors belonging to key 4 sectors





Introduction

The global average temperature for 2024 have reached to the highest since record-keeping began in 1891. If this trend continues, the damage to the planet will become irreversible, leaving no path to recovery. Global warming not only raises the temperature but also drives significant “climate change”, disrupting global weather patterns, altering precipitation levels, and causing sea levels and ocean temperatures to rise. To avoid leaving a harmful legacy for future generations, we must take immediate action to combat climate change driven by global warming. This requires reducing greenhouse gas (GHG) emissions and achieving net zero—where emissions are balanced by absorption—as quickly as possible. Among the many sustainability challenges we face, transitioning to a decarbonized society is especially urgent, and its importance has never been greater.

In addition to addressing climate change, there is a growing need to prioritize the conservation of natural capital. This term broadly encompasses natural resources such as air, soil, water, and minerals, as well as ecosystems that include plants and animals. For a long time, natural capital has been treated as an unlimited and free resource, with little attention given to its sustainability. As a result, human activities have led to the degradation of natural systems, including the air and oceans. Many ecosystems have been disrupted, resulting in the decline and extinction of numerous plant and animal species. Natural capital serves as a critical foundation for human social and economic activities and is essential for achieving sustainable development. Therefore, protecting and preserving natural capital is a pressing and vital issue.

Climate change and the loss of natural capital are global challenges that transcend borders and are deeply interconnected. Changes in environmental conditions caused by climate change can have a significant impact on natural capital. Conversely, the depletion of forests, oceans, and other natural resources reduces carbon sinks, further accelerating climate change. The measures taken to address these issues are also intricately linked. While efforts to combat climate change can have positive effects on conserving natural capital, they may also involve trade-offs or unintended consequences. Therefore, a cautious, multifaceted, and integrated approach is essential to tackle both challenges effectively. With these considerations in mind, we have published the “Climate & Nature” report, which provides a comprehensive analysis of these intertwined issues.

The climate change section of the report presents an analysis of MUFG AM’s portfolio and a transition plan developed through qualitative evaluations of key sectors by our analysts. In the section on natural capital, we have included analyses using ENCORE (Exploring Natural Capital Opportunities, Risks, and Exposure), a nature-related analysis tool, as well as MUFG AM’s past initiatives aimed at addressing challenges related to natural capital.

Guided by our philosophy of “Investing for Our Sustainable Future,” we will continue to enhance our initiatives to address these challenges, striving to resolve environmental and social issues while promoting sustainability. Through these efforts, we aim to contribute to the sustainable growth of our investee companies and seek to achieve improved long-term economic investment returns.

Executive Summary

Key points in each topic

1 Climate Change

- Identifying and visualizing sectors in MUFG AM's portfolio that need prioritized decarbonization efforts by analyzing emissions, transition risks, and physical risks.
- Disclosure of transition plans toward achieving interim goals in 2030 and past annual performance of carbon intensity
- Conducting a qualitative analysis of four critical sectors to identify key drivers for decarbonization, as well as climate-related risks and opportunities, to prioritize actions for achieving the interim goal.

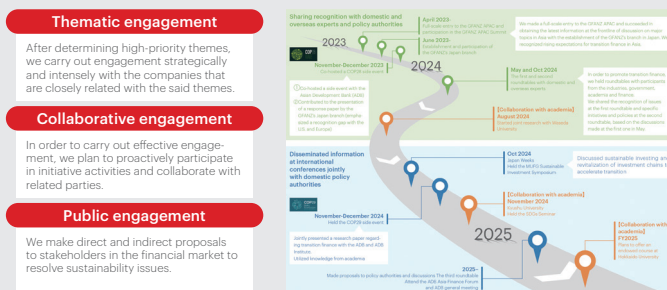
2 Natural Capital and Biodiversity

- Recognizing the inseparable and interconnected relationship between climate change and natural capital/biodiversity, we explore the role of financial institutions and the policies MUFG AM adopts to address both challenges.
- Analyze sectors with significant dependence on and impact on natural capital and biodiversity using the ENCORE framework, and leverage the findings for engagement with companies.



3 Engagement

- Highlight three approaches for driving decarbonization—thematic, collaborative, and public engagement—along with specific examples.



4 Governance and Risk Management

- Disclose the governance and risk management framework related to climate change and natural capital.

Meeting Body	Purpose of the meeting body
Board of Directors	• Report the content of discussion made at the Sustainability Committee
Sustainability Committee	• Discuss initiatives to resolve environmental and social issues on realization of sustainable environment and society as well as MUFG's sustainable growth
Sustainable Investment Review Committee	• Discuss policies and strategies regarding sustainable investing in the asset management business field

Sustainable investment promotion through MUFG Group collaboration

Promote sustainable investment in collaboration with the Mitsubishi UFJ Financial Group's asset management companies

To achieve

"Investing for our Sustainable Future"

In April 2023, MUFG Asset Management^{*1} ("MUFG AM") established MUFG AM Sustainable Investment ("MUFG AM Su") as a system to promote sustainable investment.

MUFG AM Su believes it can contribute to society and rewarding returns to our customers while making the global economy better and are promoting various initiatives to resolve environmental and social issues and achieve sustainability through sustainable investing.

Under the vision of "Investing for our Sustainable Future," we will contribute to resolving sustainability issues by demonstrating a high level of expertise.

^{*1} MUFG Asset Management is a brand of Mitsubishi UFJ Trust and Banking Corporation, Mitsubishi UFJ Asset Management Co., Ltd., Mitsubishi UFJ Real Estate Asset Management Co., Ltd., Mitsubishi UFJ Alternative Investments Co., Ltd., and Mitsubishi UFJ Asset Management (UK) Ltd.

^{*2} The reported assets under management are based on data as of December 31, 2024

Our Vision

"Investing for our Sustainable Future"





Climate Change

- (1) MUFG AM Portfolio analysis
- (2) Approach to realization of transition plan
- (3) Analysis of key 4 sectors by our analysts
- (4) LCA analysis and engagement plans

(1) MUFG AM Portfolio analysis

Fixed Point Analysis of Portfolio

Analysis assets are MUFG AM's domestic stocks, foreign stocks, domestic bonds (corporate bonds) and foreign bonds (corporate bonds)

In November 2021, Mitsubishi UFJ AM joined the "Net Zero Asset Managers initiative (NZAM)," a global initiative for asset managers, and expressed its commitment to achieving net zero greenhouse gas (GHG) emissions by 2050.

In October 2022, we established interim targets that cover 55 percent (approximately 41 trillion yen) of assets under management (approximately 74 trillion yen as of June 30, 2022) to reduce GHG emissions per economic intensity (absolute emissions (tCO₂e)/AUM) by 50 percent by 2030, compared to 2019.

This is the interim target that is aligned with carbon neutrality by 2050. We will further strengthen cooperation among the group and promote cross-sectional efforts to achieve this target.

This report, which targeted four assets, which are domestic stocks, foreign stocks, domestic bonds (corporate bonds), and foreign bonds (corporate bonds) in the MUFG AM portfolio (about 98.3 trillion yen (as of the end of March 2024), analyzed GHG emissions of the portfolio, transition risks and physical risks.

The breakdown of four assets analyzed is 59 percent domestic stocks, 37 percent foreign stocks, 3 percent domestic bonds (corporate bonds) and 1 percent foreign bonds (corporate bonds).

In the analysis, we first conducted a fixed-point analysis of MUFG AM's portfolio asset composition and GHG emissions data as of March 31, 2024 and made climate change-related analysis in line with the TCFD recommendations. Based on these analyses, we introduce our transition plan aimed at achieving the NZAM interim targets.

Emissions analysis – target scope

GHG emissions are categorized by "Scope 1," "Scope 2," and "Scope 3." This is indicated by "GHG Protocol," an international standard to calculate and report GHG emissions. "Scope 1" emissions are GHG directly emitted by a company, which includes GHG emitted when a manufacturer makes a product or direct emissions from the use of fuel within the company. "Scope 2" covers indirect emissions in association with the use of energy purchased by the company. "Scope 3" is emissions of other companies related to a business operator's activities other than "Scope 1" and "Scope 2." Since the data calculation method for "Scope 3" is difficult, and the accuracy of collected data varies, this analysis is based on "Scope 1" and "Scope 2" data.

Emissions analysis – Calculation method

The following calculation methods are used to measure portfolio emissions. Because the absolute emissions of the portfolio generally increase or decrease in proportion to the size of assets under management, we also use carbon intensity (emissions intensity), carbon footprint and weighted average carbon intensity to conduct an analysis besides the impact of absolute emissions.

- Absolute emissions (volume-based): Investee company's emissions
Unit is tCO₂e (CO₂ equivalent)
- Carbon intensity (carbon intensity/economic intensity): The ratio is derived by dividing an investee company's emissions by revenue. Unit is tCO₂e/USD1 million (revenue)
- Carbon footprint: The ratio derived by dividing emissions by investment amount (market value). Unit is tCO₂e/USD1 million (investment amount)
- Weighted Average Carbon Intensity (WACI): The weighted average of carbon intensity of an investee company by each company's investment ratio. Unit is tCO₂e/USD1 million (revenue)

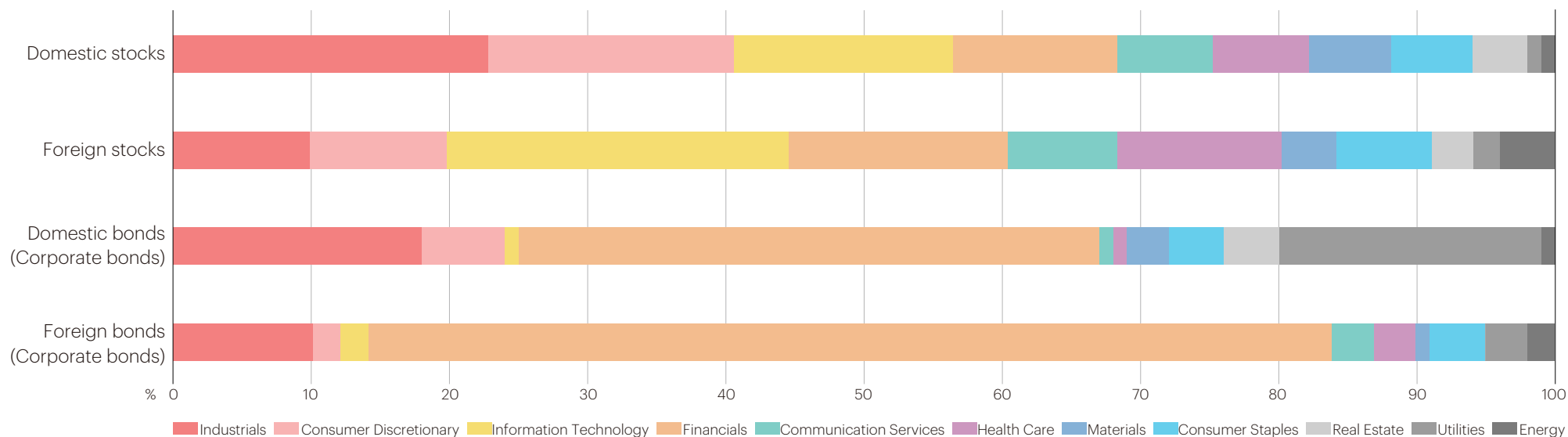
(1) MUFG AM Portfolio analysis**Fixed Point Analysis of Portfolio**

Before analyzing transition risks and physical risks of climate change, we have checked MUFG AM's portfolio composition and the status of GHG emissions as of March 31, 2024 to understand the status of the portfolio.

Composition ratio by sector of the four assets analyzed

In order to understand the trend and characteristics of GHG emissions of the portfolio, we need to know characteristics including the composition ratio by sector of each asset class. Figure 1 shows the market capitalization composition ratio of the four asset classes by sector. In the stock portfolio, the proportion of the industrials sector and consumer discretionary with large GHG emissions is high in domestic stocks. On the other hand, the proportion of the information technology, financials and health care sectors with low GHG emissions tend to

be high in foreign stocks. In the bond portfolio, the composition ratio of the financials sector is high for both domestic bonds (corporate bonds) and foreign bonds (corporate bonds). The composition ratio of industrials and utilities sectors with large GHG emissions is high among domestic bonds (corporate bonds), while the ratio of industrials sector tends to be large among foreign bonds (corporate bonds).

Figure 1: Market capitalization composition ratio by sector of the four assets analyzed

* Prepared by MUFG AM based on data as of March 31, 2024

* Bond analysis only targets corporate bonds

* Sectors are based on the Global Industry Classification Standard (GICS)

(1) MUFG AM Portfolio analysis

Fixed Point Analysis of Portfolio

Absolute emissions (based on volume)

Next, we analyzed GHG absolute emissions of targeted four assets (domestic stocks, foreign stocks, domestic bonds (corporate bonds) and foreign bonds (corporate bonds) (Figure 2). Compared to a year ago, absolute emissions of all assets increased. Compared with indexes representing each asset foreign stocks outperformed its reference index in 2024 as in the previous year, but the other three assets underperformed their reference indexes.

When the factors behind the change in emissions from the previous year were analyzed by breaking them down into three categories: “1. change in market capitalization”, “2. change in

emissions from investee companies”, and “3. other”, it was found that an increase in market capitalization had a significant positive impact on absolute emissions, while emissions from investee companies (factors affecting changes in emissions per million dollars invested) had a negative impact as a whole, excluding domestic bonds (corporate bonds) which slightly contributed positively. We believe that the efforts of the companies in which we invest to decarbonize have contributed significantly to the negative emissions of our portfolio. (Figure 3)

Figure 2: GHG absolute emissions by asset
(compared with reference indexes, compared with a year earlier) (MM tCO₂e)

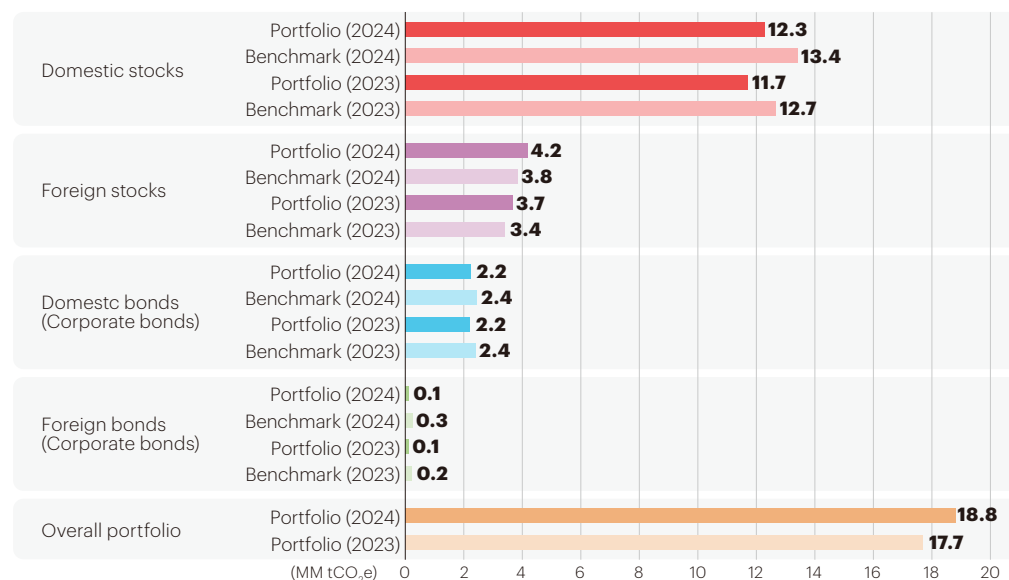


Figure 3: Factor analysis of changes in absolute emissions by asset
(to reference index, analysis based on emissions in March 2023 as 100)

Changes	Absolute emissions in 2023	1. Change factor for market capitalization	2. Change factor for emissions per USD1 million of investment	3. Other factors	Absolute emissions in 2024
Domestic stocks	100	17	-11	-2	105
Foreign stocks	100	43	-20	-9	114
Domestic bonds (Corporate bonds)	100	-4	5	0	101
Foreign bonds (Corporate bonds)	100	25	-13	-3	109

* Bond analysis targets only corporate bonds, and the scope of GHG emissions is Scope 1 and Scope 2.
(Source) Prepared by MUFG AM based on data provided by S&P (obtained in November 2024)

(1) MUFG AM Portfolio analysis

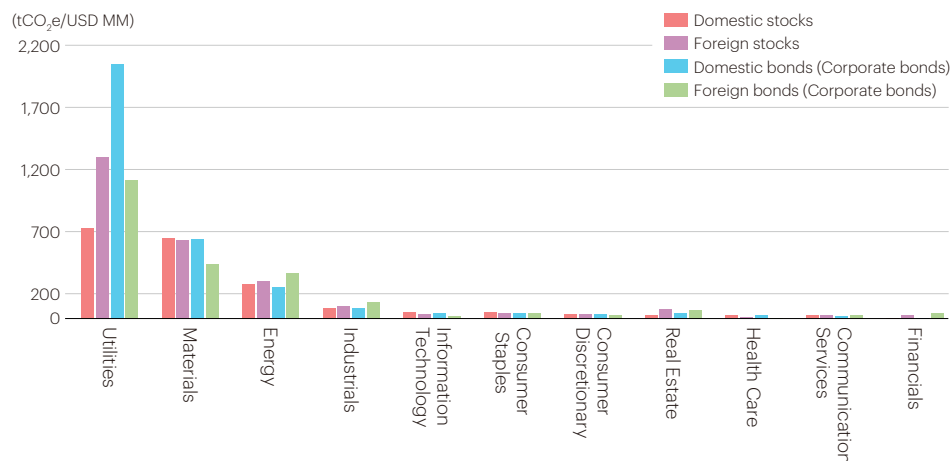
Fixed Point Analysis of Portfolio

Carbon intensity

As indicated in Figure 4, in order to understand differences in GHG emissions by sector in each portfolio, we analyzed the carbon intensity of investee companies (carbon intensity, emissions per USD 1 million in revenue) and examined the characteristics of GHG emissions by sector for each asset class.

GHG emissions of utilities, materials and energy sectors were large for all four assets, and it was confirmed that those three sectors are large emission sectors. It is thought to be due to the fact that the utilities sector includes electric power companies with relatively large GHG emissions, and the materials sector has the steel industry and chemicals-related names that have relatively large GHG emissions.

Figure 4: Carbon intensity by sector (carbon intensity, GHG emissions per USD 1 million in revenue)



* Bond analysis targets only corporate bonds, and the scope of GHG emissions is Scope 1 and Scope 2.

* Sectors are based on the Global Industry Classification Standard (GICS)

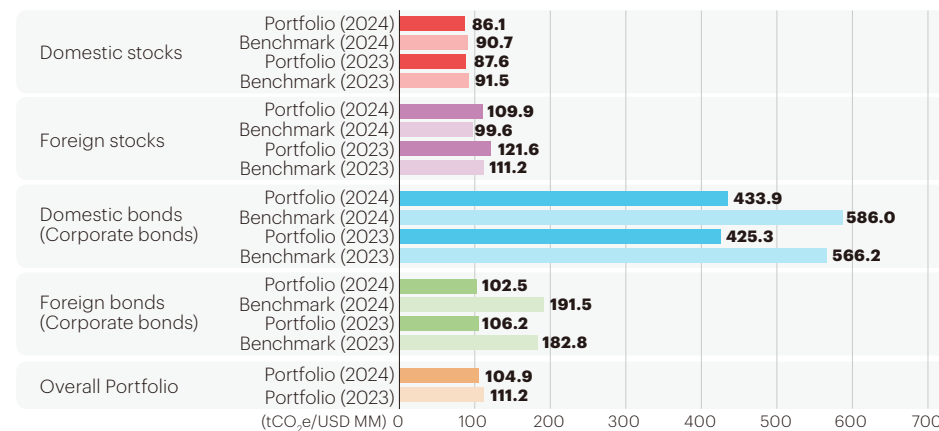
(Source) Prepared by MUFG AM based on data provided by S&P Global (obtained in November 2024)

Weighted Average Carbon Intensity (WACI)

Next, we analyzed four asset classes based on the weighted average carbon intensity (WACI) recommended by the Task Force on Climate-related Financial Disclosures (TCFD) (Figure 5). WACI is a weighted average of the carbon intensity (GHG emissions per \$1 million in revenue) of investee companies, according to their weights in our portfolio. The WACI is particularly high for domestic bonds (corporate bonds). As stated before, this can be attributed to the relatively high ratio of the utility sector, which has high GHG emissions per unit of sales, in the composition of domestic bonds (corporate bonds) by industry. Compared to the previous year, the value of the three assets excluding domestic bonds (corporate bonds) decreased. Compared to the indexes representing the asset classes (reference indexes), foreign stocks remained slightly above the reference indexes in 2024, but the other asset classes were below.

A factor breakdown of the sectoral changes is summarized in Chart 8.

Figure 5: Weighted Average Carbon Intensity (WACI) of four assets (tCO₂e/USD MM)



* Bond analysis targets only corporate bonds, and the scope of GHG emissions covers Scope 1 and Scope 2.

(Source) Prepared by MUFG AM based on data provided by S&P Global

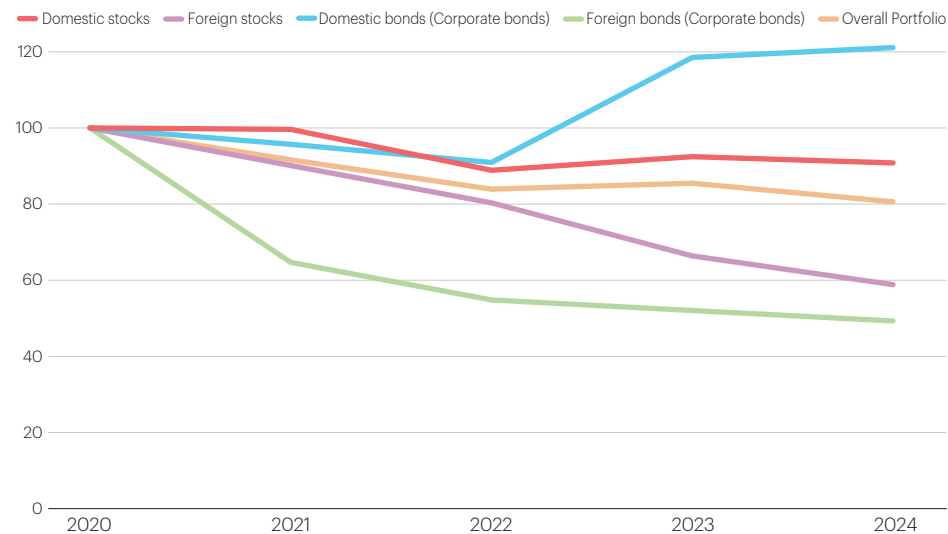
(1) MUFG AM Portfolio analysis

Fixed Point Analysis of Portfolio

Historical change of Weighted Average Carbon Intensity (WACI)

Figure 6 shows the history of the Weighted Average Carbon Intensity (WACI) since the end of March 2020. The WACI of each portfolio as of March 31, 2020 is set as 100. Domestic bonds (corporate bonds) recently have a tendency to rise. Since the portfolio of domestic bonds (corporate bonds) has a low composition ratio in the MUFG's overall portfolio, it is falling in the overall portfolio.

Figure 6: Historical change of Weighted Average Carbon Intensity (WACI) for four assets



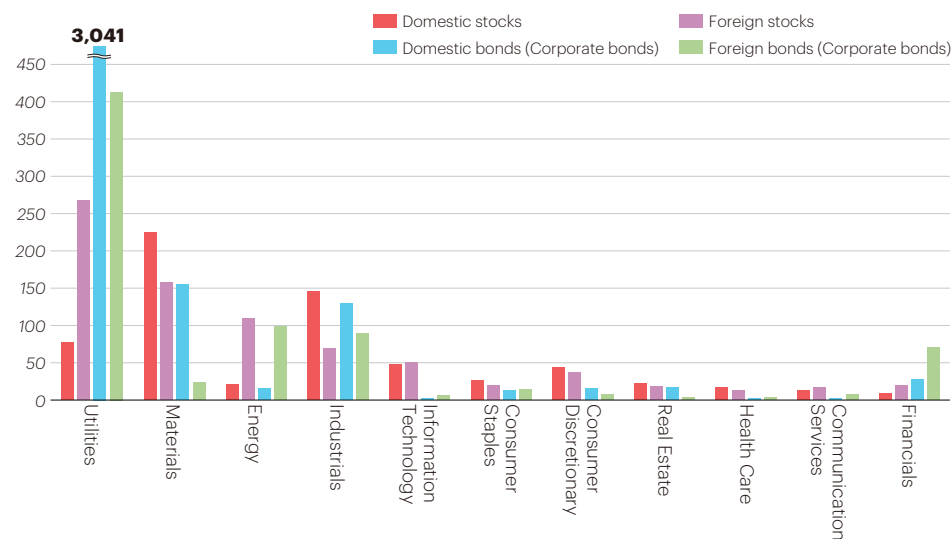
* Figures as of the end of March 2020 are set as 100.

* Bond analysis targets only corporate bonds, and the scope of GHG emissions is Scope 1 and Scope 2.
(Source) Prepared by MUFG AM based on data provided by S&P Global (obtained in November 2024)

Weighted Average Carbon Intensity (WACI) by sector

Figure 7 shows the portfolio's weighted average carbon intensity (WACI) by sector as of March 31, 2024. In the stock portfolio, domestic stocks have higher weighted average carbon intensity (WACI) in materials and industrials sector than foreign stocks, while foreign stocks have higher WACI in utilities and energy sector. In the bond portfolio, domestic bonds (Corporate Bonds) have high WACI in utilities, while foreign bonds (Corporate Bonds) have high WACI in energy and financials sector. The factor breakdown of changes in WACI by sector for each asset is summarized in Figure 8.

Figure 7: Weighted average carbon intensity (WACI) by sector for four assets (tCO₂e/USD MM)



* Bond analysis targets only corporate bonds, and the scope of GHG emissions is Scope 1 and Scope 2.

* Sectors are based on the Global Industry Classification Standard (GICS)
(Source) Prepared by MUFG AM based on data provided by S&P Global (obtained in November 2024)

(1) MUFG AM Portfolio analysis

Fixed Point Analysis of Portfolio

Figure 8: Change in the Weighted Average Carbon Intensity (WACI) from previous year / Factor breakdown by sector for four assets

Domestic stocks

	2023 WACI	2024 WACI	YOY	(tCO ₂ e/USD MM)		
				Factors		
Overall	88	86	-2	Ownership ratio	Carbon intensity	Others
Communication services	2	2	0	0	0	0
Consumer discretionary	6	6	0	0	0	0
Consumer staples	5	3	-2	0	1	-3
Energy	2	3	1	0	8	-7
Financials	1	1	0	0	0	0
Health care	3	2	-1	0	2	-3
Industrials	19	20	1	0	0	1
Information technology	7	7	0	0	0	0
Materials	31	30	-1	0	0	-1
Real estate	3	3	0	0	0	0
Utilities	9	9	0	0	0	0

Domestic bonds (Corporate Bonds)

	2023 WACI	2024 WACI	YOY	(tCO ₂ e/USD MM)		
				Factors		
Overall	425	434	9	Ownership ratio	Carbon intensity	Others
Communication services	0	0	0	0	1	-1
Consumer discretionary	2	2	0	3	0	-3
Consumer staples	2	2	0	1	1	-2
Energy	2	2	0	3	5	-8
Financials	4	4	0	0	0	0
Health care	1	1	0	0	0	0
Industrials	16	17	1	11	7	-17
Information technology	0	0	0	0	0	0
Materials	21	21	0	0	0	0
Real estate	2	2	0	7	3	-10
Utilities	375	383	8	-35	156	-113

Foreign stocks

	2023 WACI	2024 WACI	YOY	(tCO ₂ e/USD MM)		
				Factors		
Overall	122	110	-12	Ownership ratio	Carbon intensity	Others
Communication services	2	2	0	0	0	0
Consumer discretionary	5	5	0	0	0	0
Consumer staples	4	3	-1	0	0	-1
Energy	15	15	0	0	0	0
Financials	3	3	0	0	0	0
Health care	2	2	0	0	0	0
Industrials	11	10	-1	0	0	-1
Information technology	6	7	1	0	0	1
Materials	27	23	-4	1	1	-6
Real estate	3	3	0	0	0	0
Utilities	44	37	-7	1	0	-8

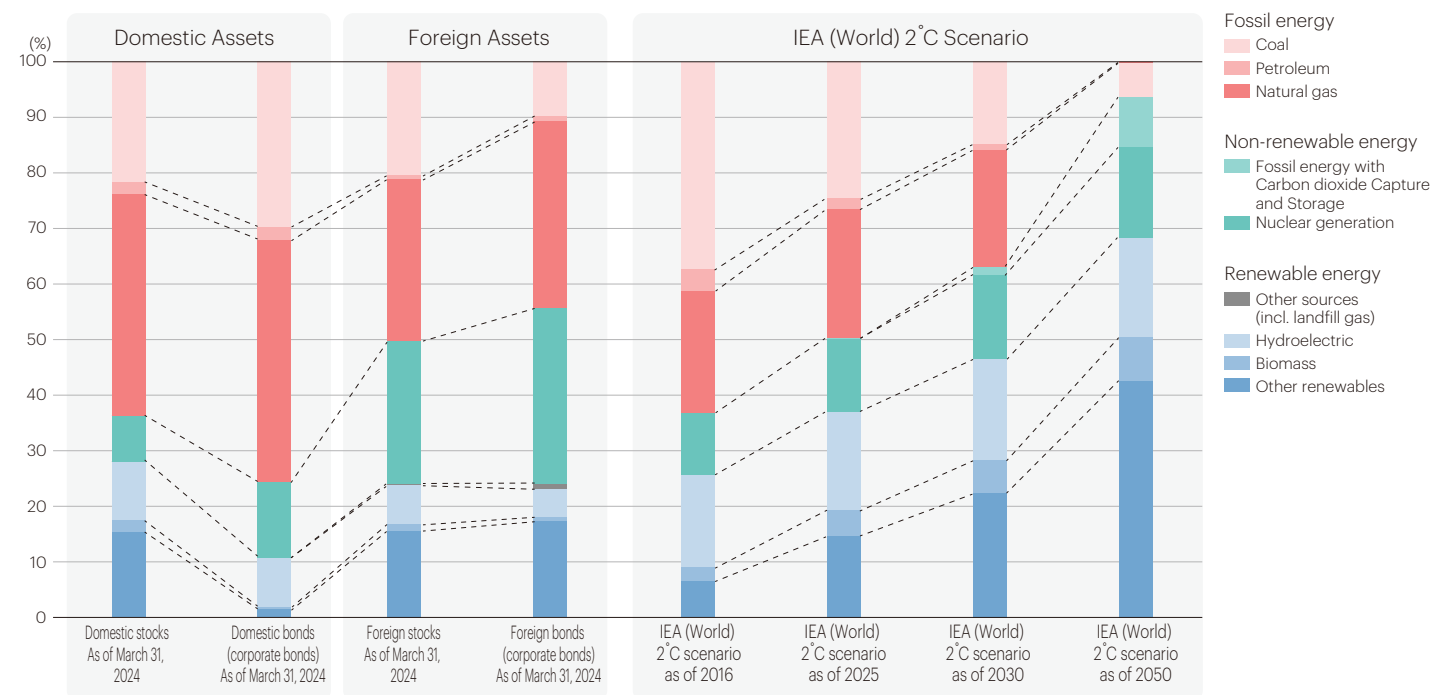
Foreign bonds (Corporate Bonds)

	2023 WACI	2024 WACI	YOY	(tCO ₂ e/USD MM)		
				Factors		
Overall	106	103	-3	Ownership ratio	Carbon intensity	Others
Communication services	1	1	0	0	0	0
Consumer discretionary	1	1	0	0	0	0
Consumer staples	2	2	0	0	0	0
Energy	12	15	3	0	3	0
Financials	9	10	1	0	1	0
Health care	0	0	0	0	0	0
Industrials	6	12	6	2	4	0
Information technology	1	1	0	0	0	0
Materials	3	4	1	0	1	0
Real estate	0	0	0	1	1	-2
Utilities	71	57	-14	-1	-2	-11

(1) MUFG AM Portfolio analysis

Transition Risks (Energy mix)

Figure 9: Energy mix*¹ for each of the four assets as of March 31, 2024 and energy in conformity with the IEA (World) 2°C scenario*²



(Source) Prepared by MUFG AM based on data provided by S&P Global (obtained in November 2024)

Figure 9 compares and organizes the energy mix of MUFG AM's domestic and foreign portfolios as of March 31, 2024, as well as the energy mix as of 2016, 2025, 2030 and 2050 under the IEA (World) 2°C scenario. Energy mix data by S&P aggregates and discloses the amount of electricity produced (GWh) by companies operating power generation businesses in the portfolio. The analysis confirmed domestic assets, which are both stocks and bonds (corporate bonds), relied more on fossil energy including coal, petroleum and natural gas than foreign assets.

In order to realize the energy mix in conformity with the IEA (World) 2°C scenario, it is essential to make a significant transition to renewable energy, compared to that of March 31, 2024. Assuming this scenario, decarbonization moves are needed to be accelerated further, and additional costs associated with a change in carbon prices may have a more obvious impact on corporate activities.

Explanation of sustainability-related terms

*1 Energy mix

Energy mix refers to the combination of multiple generation methods used to supply electricity needed by the society and is also called power source mix. Examples of energy sources include hydroelectric power, natural gas and solar power. It requires the combination taking into account realization of economic efficiency, sustainability, and safe energy supply.

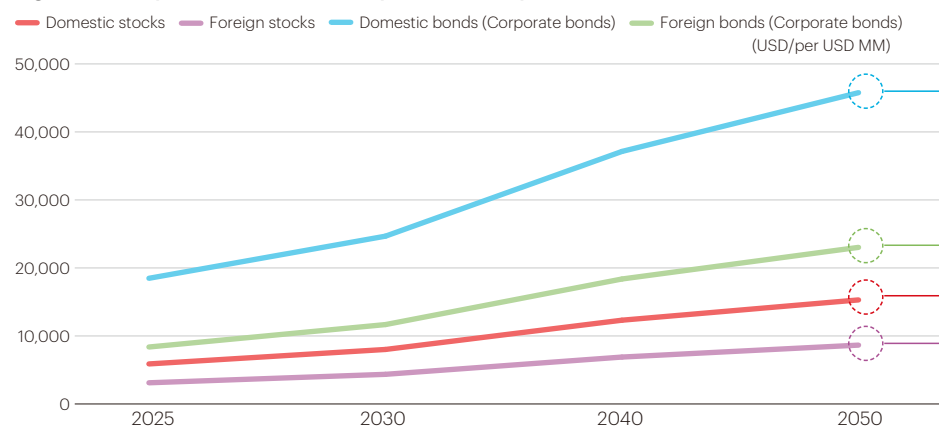
*2 IEA (World) 2°C scenario

The IEA (World) 2°C scenario is the name given by S&P. Based on the "energy mix to achieve a low-carbon society" displayed by the International Energy Agency (IEA), S&P has created and provided an energy mix to "limit global warming to 2°C above pre-industrial levels as of 2050," which is the Paris Agreement's long-term goal.

(1) MUFG AM Portfolio analysis

Transition Risks (Carbon Earnings at Risk)

Figure 10: Unpriced carbon cost by four assets per USD 1 million of assets held



* Bond analysis targets only corporate bonds

* Sectors are based on the Global Industry Classification Standard (GICS)

* Unpriced carbon cost is derived by dividing “additional costs by asset class at each point in time” by “the amount of assets held by class as of March 31, 2024,” and figures per USD 1 million are shown in the graph.

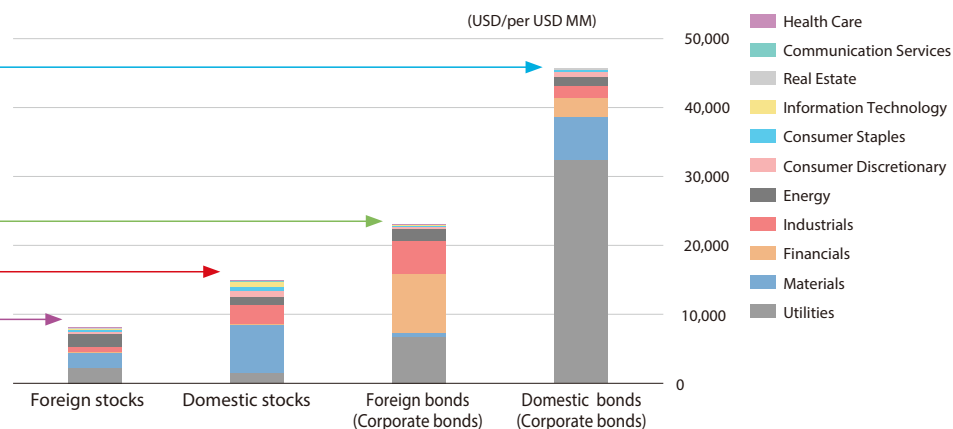
* The additional costs to businesses due to future carbon price changes are assessed on the basis of estimated scenarios from the studies by Organization for Economic Co-operation and Development (OECD) and IEA that assume sufficient policies are placed to meet the Paris Agreement’s 2°C target.

(Source) Prepared by MUFG AM based on data provided by S&P Global (obtained in November 2024)

As stated in p.13, measures toward decarbonization need to be accelerated further, and pressure on companies to make energy transition is predicted to increase even more. “Carbon Earnings at Risk Analysis” that S&P provides is a model that quantitatively assesses the additional costs (Unpriced Carbon Cost) that future changes in carbon prices will impose on companies. It shows that the transition risk associated with decarbonization will be higher, if the unpriced carbon costs get higher.

Figure 10 shows the figure derived by dividing “additional costs by asset class at each point in time” by “the value of assets held by asset class as of March 31, 2024,” and it was translated into per USD 1 million, in order to analyze future additional costs excluding the asset composition ratio factors of the portfolio. As a result of the analysis, additional costs for domestic bonds (corporate bonds) as of 2050 are significantly large, compared to other asset classes.

Figure 11: Unpriced carbon cost by four assets per USD 1 million of assets held and sector



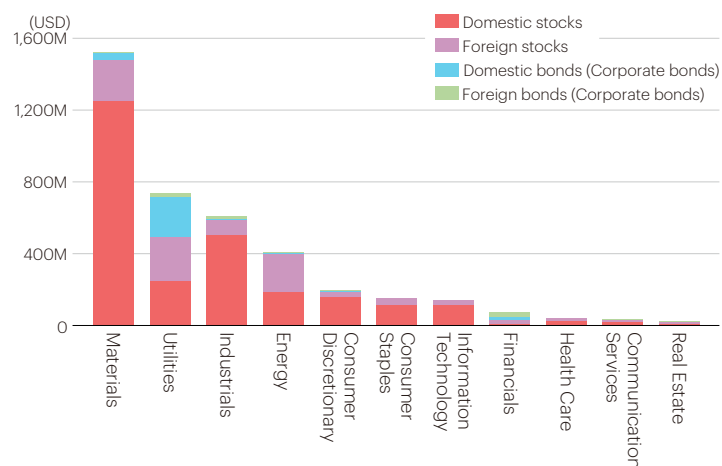
In order to identify this factor, Figure 11 breaks down additional costs by sector as of 2050. The biggest factor for domestic bonds (corporate bonds) to have the largest additional cost is its high composition ratio of the utilities sector (including electric power companies) in its asset class that have large GHG emissions and are expected to face significant additional costs in the future.

On the other hand, sector composition is more diversified for domestic and foreign stocks than bonds (corporate bonds), and their additional costs are higher than bonds (corporate bonds) whose asset composition ratio is relatively smaller. With this, additional costs per USD 1 million are lower than bonds (corporate bonds). The size of additional costs is largely affected by characteristics of a sector’s business that consists of an asset class. Taking into account business characteristics, it is important to consider policy for dialogues with companies to lower future transition risks.

(1) MUFG AM Portfolio analysis

Transition Risks (Carbon Earnings at Risk)

Figure 12: Unpriced Carbon Cost by sector and four asset classes



* Bond analysis targets only corporate bonds
 * Sectors are based on the Global Industry Classification Standard (GICS)
 * The additional costs to businesses of future carbon price changes are assessed on the basis of estimated scenarios from the studies by Organization for Economic Co-operation and Development (OECD) and IEA that assume policies enough to meet the Paris Agreement's 2°C target will be introduced
 (Source) Prepared by MUFG AM based on data provided by S&P Global (obtained in November 2024)

Figure 12 shows the unpriced carbon cost (additional costs) as of 2050 estimated by S&P, which takes into account the asset composition ratio and is organized by sector.

The analysis result shows especially large additional costs are expected in the materials, utilities, industrials and energy sectors. It has become clear that major additional costs are expected for the materials and industrial sectors among domestic stocks, the utilities sector among domestic bonds (corporate bonds) and the materials, utilities and energy sectors among foreign stocks. Factors contributing to the major additional costs in these sectors include the significant impact of changes in carbon prices on businesses and the substantial investment in MUFG AM's portfolio.

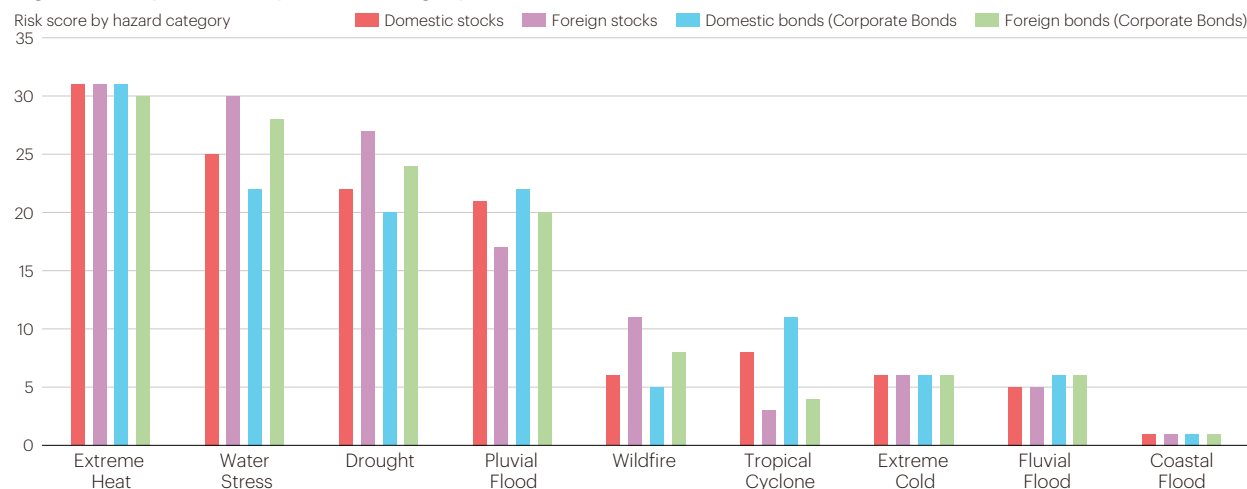
The risk analysis per unit such as "per USD 1 million" as confirmed in Figures 10 and 11 is important to compare and evaluate business characteristics by sector without any bias. Meanwhile, the risk analysis taking into account weighting for each asset class as seen in Figure 12 is an important approach to identify sectors and groups of companies that require priority response, because it considers asset allocations and composition characteristics of MUFG AM's portfolio.



(1) MUFG AM Portfolio analysis

Physical Risks (Risk score by hazard category)

Figure 13: Physical risk by hazard category (as of 2050)



* Bond analysis targets only corporate bonds

* The risk amount as of 2050 is measured by using the SSP1-2.6 scenario (the scenario that GHG emissions are reduced to the level where GHG emissions reach net zero by 2050, and the temperature increase is limited to be 1.3-2.4°C by 2100 in conformity with the Paris Agreement's 2°C target) used in the Intergovernmental Panel on Climate Change (IPCC) report.

(Source) Prepared by MUFG AM based on data provided by S&P Global (obtained in November 2024)

S&P evaluates and scores the physical risks brought by climate change in nine categories including extreme heat and water stress. In Figure 13, scores by category as of 2050 are organized by asset class, using the model built on the scenario in conformity with the Paris Agreement's 2°C target. The estimation of physical risks have multiple scenarios, but the reason we used scenarios in conformity with the 2°C target in this report is that we conduct an analysis of transition risks that takes into account the progress of decarbonization. It is therefore appropriate to align the assumptions. The analysis result confirmed that four physical risks, which are extreme heat, water stress, drought and pluvial flood, are especially at high levels. Physical risks of hazards including extreme heat and drought are high, because each hazard is

Explanation of sustainability-related terms

The 2°C target of the Paris Agreement

The Paris Agreement is an international framework for addressing climate change issues from 2020 onwards and was adopted at the 2015 international conference (COP21).

The Paris Agreement sets out two long-term goals: the "2°C goal", which aims to keep the rise in global average temperature "well below 2°C above pre-industrial levels", and the "1.5°C goal", which aims to pursue efforts to limit the temperature increase to 1.5°C.

SSP Scenario

The SSP scenario is a scenario that shows the outlook for global warming up to the year 2100, as presented by the Intergovernmental Panel on Climate Change (IPCC). There are five scenarios, depending on the progress of environmental measures, and the SSP1-2.6 scenario is based on the premise that carbon neutrality will be achieved in the second half of the 21st century, and that the increase in temperature compared to pre-industrial revolution levels will be limited to 2°C by the year 2100.

predicted to have a negative impact, even if a temperature increase is limited to 2°C.

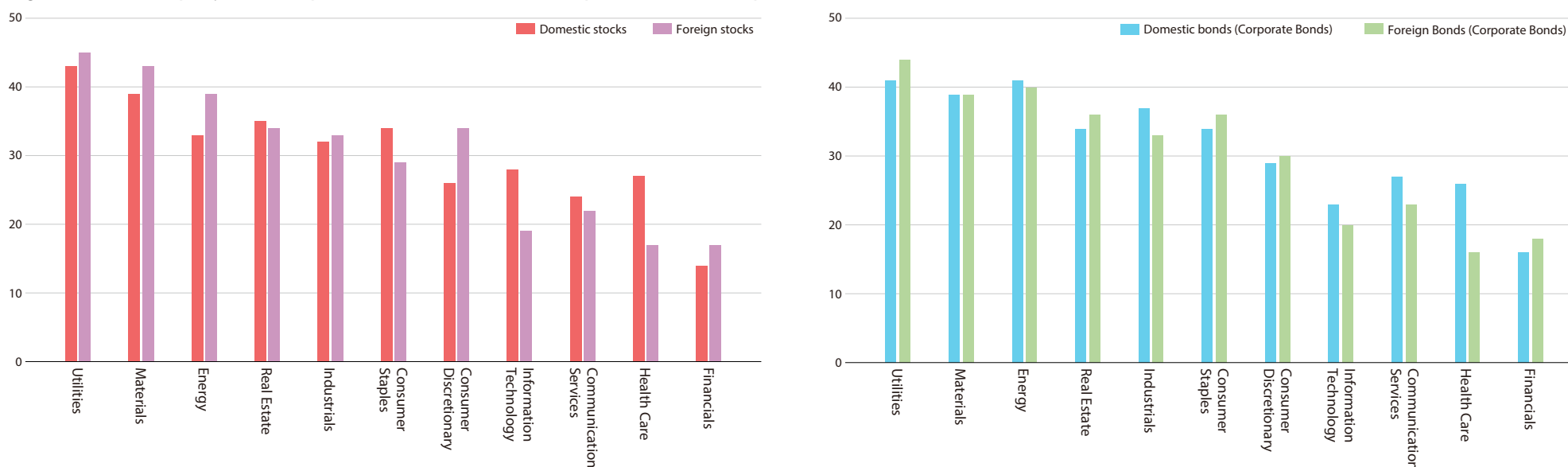
Based on the analysis result, it is important to identify regions with a high likelihood of hazardous events, as well as sectors, companies and business activities that are particularly vulnerable to such impacts. Additionally, it is crucial to prioritize dialogue with sectors and companies that are significantly affected.

Furthermore, risk scores presented in Figure 13 are quantified for each asset class on a scale of 1-100. For that reason, asset allocation weights are not taken into account in the physical risk scores shown in Figure 13.

(1) MUFG AM Portfolio analysis

Physical Risks (Composite risk scores by sector)

Figure 14: Sensitivity-adjusted composite risk scores (as of 2050) by the Global Industry Classification Standard (GICS) sector



* Bond analysis targets only corporate bonds

* Sectors are based on the Global Industry Classification Standard (GICS)

* The risk amount as of 2050 is measured by using the SSP1-2.6 scenario (the scenario that GHG emissions are reduced to the level where GHG emissions reach net zero by 2050, and the temperature increase is limited to be 1.3-2.4°C by 2100 in conformity with the Paris Agreement's 2°C target) used in the Intergovernmental Panel on Climate Change (IPCC) report.

(Source) Prepared by MUFG AM based on data provided by S&P Global (obtained in November 2024)

S&P offers the "Composite Score," which integrates risk scores calculated for nine hazard categories and rescaled them on a scale of 1-100. S&P also offers the "Sensitivity-Adjusted Composite Score," which is derived by analyzing how sensitive a company's business and assets are to physical scores and reflecting the result in the "Composite Score."

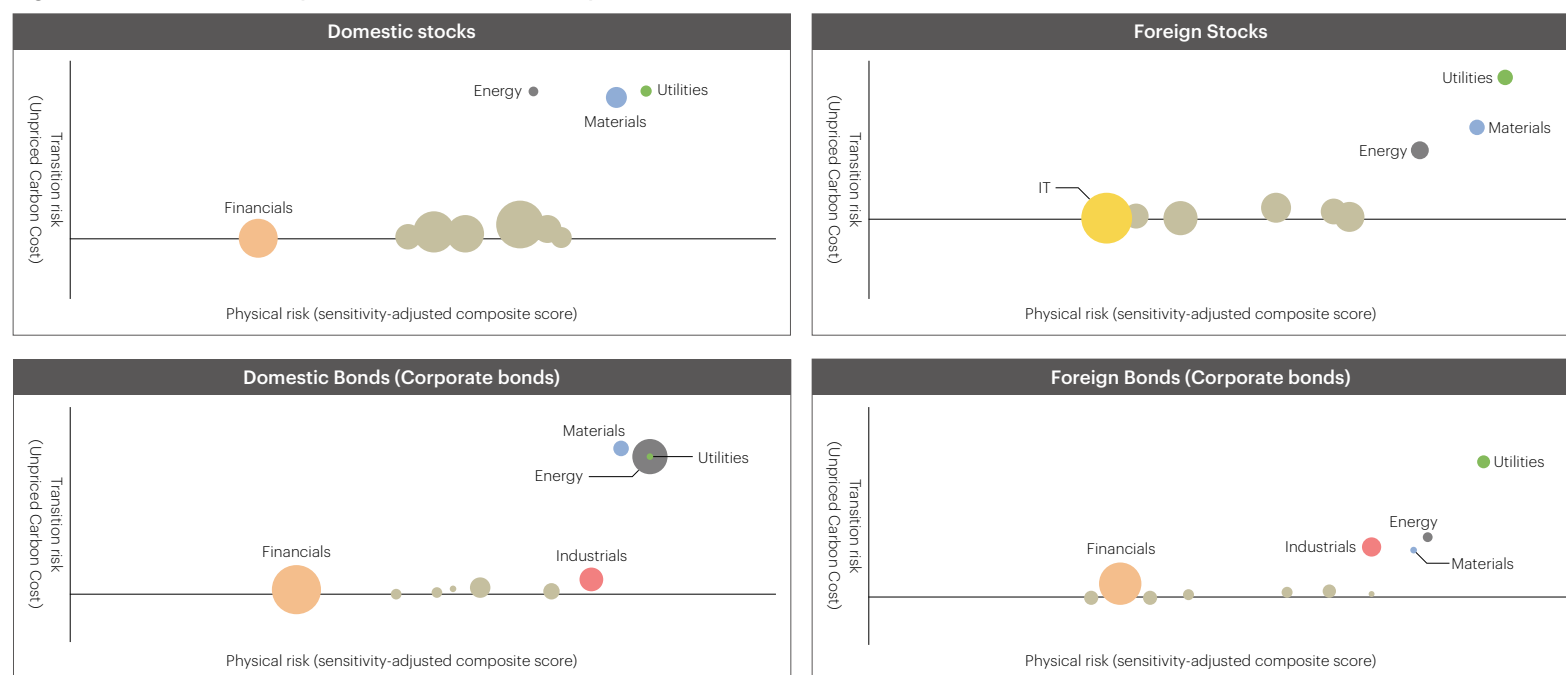
Figure 14 organizes the "Sensitivity-Adjusted Composite Score" of each sector by asset

class as of 2050. The analysis result shows that the impact of physical scores differs, depending on an asset class. Specifically, potential physical risks for the utilities, materials and energy sectors tend to be higher in any asset class, while risks for information technology, communication services, health care and financials sectors tend to be relatively lower.

(1) MUFG AM Portfolio analysis

Transition Risk by sector x Physical Risk x The amount of assets held

Figure 15: Transition Risk by sector of four assets x Physical risk x The amount of assets held



- * Bond analysis targets only corporate bonds
 - * Sectors are based on the Global Industry Classification Standard (GICS)
 - * The physical risk (sensitivity adjusted composite score) is measured by using the SSP1-2.6 scenario (the scenario that GHG emissions are reduced to the level where GHG emissions reach net zero by 2050, and the temperature increase is limited to be 1.3-2.4°C by 2100 in conformity with the Paris Agreement's 2°C target) used in the Intergovernmental Panel on Climate Change (IPCC) report.
 - * Transition risks are derived by dividing additional costs by sector (as of 2050) by the amount of assets held by sector and aggregating the value per USD 1 million.
 - * The size of the bubble is illustrated based on the relative size of assets held within each asset class.
- (Source) Prepared by MUFG AM based on data provided by S&P Global (obtained in November 2024)

Figure 15 places transition risks as of 2050 on the vertical and physical risks (sensitivity adjusted composite score) as of 2050 on the horizontal axis with the size of the bubble expressed in proportion to the assets held by each sector of our portfolio as of the end of March 2024. The analysis shows that the materials, utilities and energy sectors have relatively high risks in domestic and foreign stocks. On the other hand, the financials and information technology sectors tend to have lower risk across asset classes and are currently considered less exposed to climate change risks. However, we also need to closely monitor the situation for these sec-

tors. In addition to the evaluation of transition risks and physical risks, it is important to comprehensively consider the size of assets held by each sector. Particularly, risk management in sectors with large asset holdings is likely to have a direct impact on profitability and stability of our overall portfolio.

We believe that by utilizing the results of the analysis of the risks and asset holdings indicated in the chart, we can identify the sectors that require priority engagement.

(1) MUFG AM Portfolio analysis

Qualitative analysis of Climate change-related risks and opportunities

Figure 16: Qualitative analysis of risks and opportunities across MUFG AM'S portfolio

Risk and opportunity	Example of risk and opportunity	Short- and mid-term	Long-term	Financial impact
Risks that hinder enhancement of corporate value	【Policy and legal risk】Implementation of carbon pricing system such as carbon taxes	○	○	Big
	【Policy and legal risk】Stricter industrial emission standards and reporting requirements	○		
	【Technology risk】Obsolescence of existing equipment and technology due to delays in technology adoption		○	
	【Market risk】Falling demand in products and services due to a change in consumer preference		○	Big
	【Reputation risk】Criticism against companies' insufficient environment response	○	○	
	【Physical risk (acute)] Suspension of infrastructure and businesses due to extreme weather conditions		○	Big
Opportunities contributing to enhancement of corporate value	【Physical risk (chronic)] Falling worker productivity due to rising temperature	○	○	
	【Resource efficiency】Cost reduction by efficient use of resources		○	
	【Energy source】Entry to a new market through dissemination of the green technology		○	Big
	【Products and services】Rising demand for products and services contributing to low carbon and low emission		○	Big
	【Markets】Gaining a new profit source through expansion of carbon credit trading	○	○	
	【Resilience】Realization of stable supply through diversification of supply chains		○	

Points of analytical views on sustainability issues

- Rising carbon prices and stricter emissions standards due to climate change push up business costs. However, taking appropriate measures supports gaining market trust, maintaining and enhancing competitiveness. Although technology obsolescence and delayed implementation can be a threat to many sectors, increasing demand for green technology and products/services contributing to decarbonization and low emissions will be opportunities to enter new markets. That will promote a change in consumer preferences and product differentiation, bringing about changes in the industrial structure.
- Physical risks due to extreme weather conditions threaten business continuity and force companies to rebuild their business models through pressure including a lack of supply in resources. On the other hand, better use of resources and reduction in wastes will lead to lowering costs and improving competitiveness, and expansion in credit trading is also expected as a new profit source.
- Companies are required to pursue sustainable growth by capturing a change in times, minimizing risks and proactively taking advantage of new opportunities.

In the final recommendations report that the Task Force on Climate-related Financial Disclosures (TCFD) unveiled in June 2017, climate-related risks were divided into two categories, which were “transition risks (risks associated with a transition to a low-carbon economy)” and “physical risks (risks arising from physical impact from climate change).” In addition, the TCFD presented five categories of climate-related “opportunities.” Those are “Resource Efficiency,” “Energy Source,” “Products and Services,” “Markets” and “Resilience,” and companies are required to identify and disclose these risks and opportunities.

Figure 16 organizes risks and opportunities that have impact on business activities and

profitability of companies in MUFG AM's overall portfolio, based on the TCFD's framework. MUFG AM grasps macro-level risks and opportunities associated with climate change that investee companies face. Based on this, we identify the areas that should be prioritized by proceeding with detailed sector-by-sector analysis.

As such, by combining a macro-view based on big-picture trends and a micro-view focusing on sectors and individual companies, we should comprehensively capture climate change risks and opportunities as well as deeply understand the strengths companies have and the challenges they face to promote investment management and engagement.

Climate Change

- (1) MUFG AM Portfolio analysis
- (2) Approach to realization of transition plan
- (3) Analysis of key 4 sectors by our analysts
- (4) LCA analysis and engagement plans



(2) Approach to realization of transition plan

Visualization of pathways to intermediate targets and high-emitting sectors

Figure 1: Transition plan (pathway) toward achieving the NZAM interim goal and actual GHG emissions

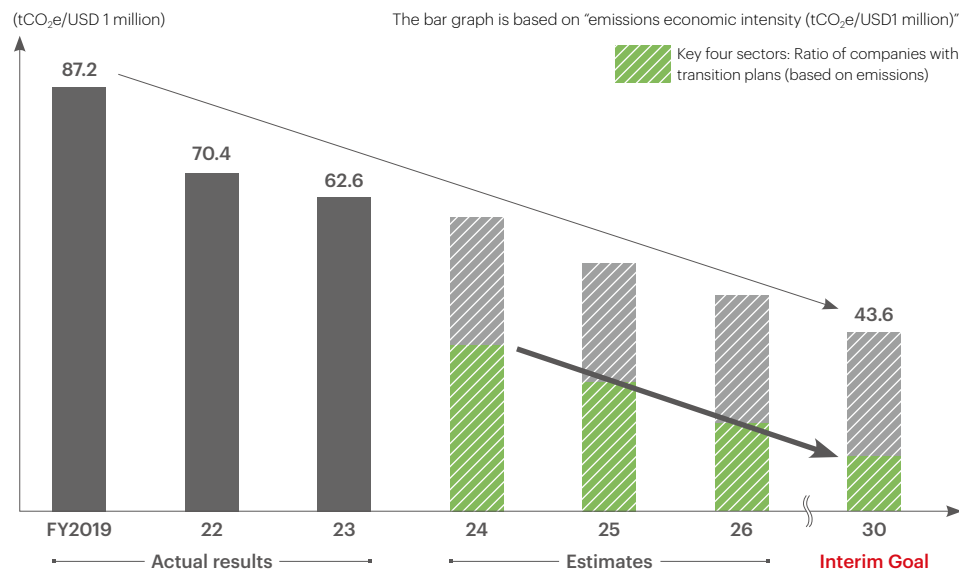
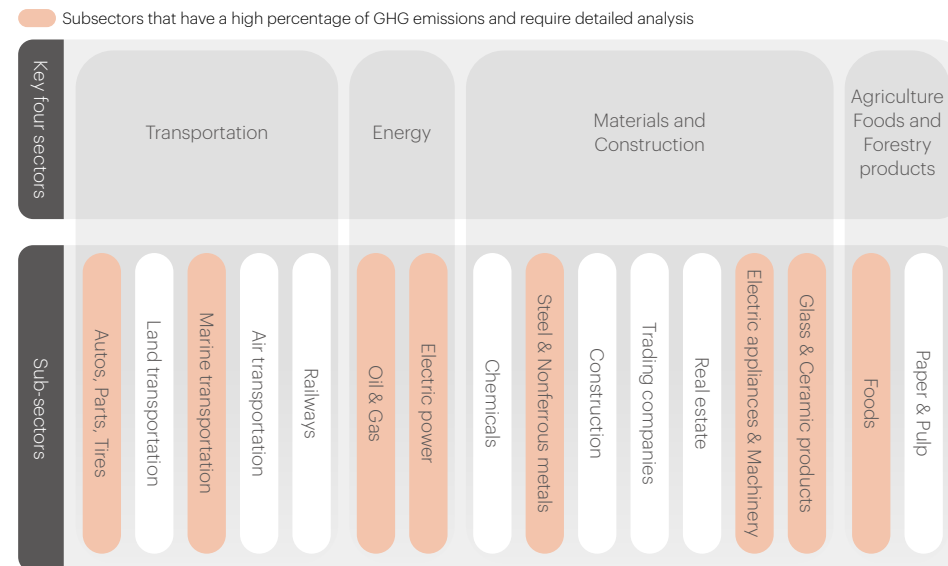


Figure 2: A list of sub-sectors linked to TCFD key four sectors



MUFG announced its NZAM interim target to “reduce GHG emissions by 50 percent by 2030, compared to FY2019 for 55 percent of assets under management” in 2022.

Figure 1, which shows actual emissions data and transition plans (pathways) toward the interim goal, indicates that GHG emissions have been steadily decreasing, but this pace of a decline needs to be maintained and expanded to achieve the interim target for 2030.

As means to achieve this, four sectors with large GHG emissions (hereinafter referred to as the “key four sectors”) were extracted from the sector classification defined by the Task Force on Climate-related Financial Disclosures (TCFD) in order to identify sectors with large impact toward achieving the interim goal. The key four sectors were designated as priority sectors for analysis and were further subdivided into 16 sub-sectors for more detailed analysis (Figure 2).

These sub-sectors were independently classified using the Tokyo Stock Exchange’s 33 sectors as a reference.

From the next page, we summarize qualitative analysis of risks and opportunities in the key four sectors stated above by our analysts. Besides identifying main drivers of GHG emissions in each sector, we also conducted a detailed analysis of sub-sectors. We aim to achieve a transition plan (pathway) for decarbonation by implementing more effective engagement based on these analysis results.

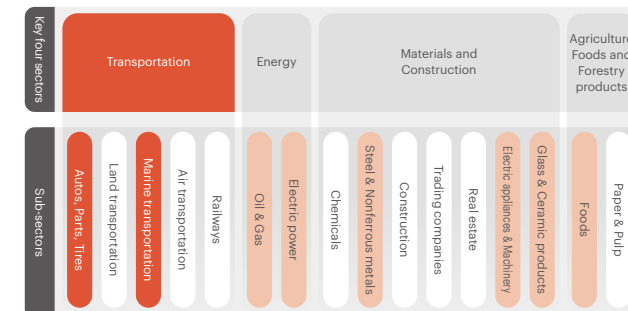
In addition to these sector analyses, we conduct a deep approach by the Life Cycle Assessment (LCA) analysis* for engagement with each individual company and implement more effective engagement by formulating an engagement plan for each company.

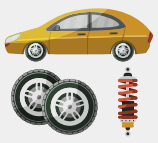
* Life cycle assessment is a method to calculate the environmental impact of a product or service throughout its life cycle, from the process of procuring and providing products to disposal and recycling.

(3) Analysis of key 4 sectors by our analysts

Transportation sector

- Of the five sub-sectors in the transportation sector, the page analyzed Automobiles, Automotive parts, Tires and Marine transportation of the five sub-sectors of the transportation sector.
- The transportation sector has large GHG emissions associated with energy consumption such as gasoline. As a key driver to reduce GHG emissions, for example in the auto industry, we believe it is important to promote the spreading of next-generation cars such as electric cars from gasoline cars, improve technology to shift to alternative energy sources (such as ammonia and hydrogen) to substitute gasoline and improve efficiency of traffic control.



Sub-sectors	Key drivers to reduce GHG emissions that analysts consider	Analyst
Automobiles, Automotive parts, Tires 	Measures to lower CO₂ progressed in the product usage process, which account for more than 80 percent of total supply chain emissions, mainly because of an increase in the electrification ratio (5% in 2018 → 28% in 2023; EV ratio 2% → 12%). The gap between rapid EV promotion policies and market needs is widening, and major automobile manufacturers in the world are forced to review their strategies. The challenge is to determine effective low-carbon measures and the timing of implementation from the perspective of widespread adoption, taking into account usage conditions, fuel situations, power supply mix and infrastructure in each market. We will discuss the construction of a green supply chain and the establishment of a growth model that does not rely on mass production of new cars as a long-term theme.	 Akira Tanaka
Marine transportation 	- In the marine transportation industry, GHG emissions are being reduced through steady implementation of measures such as the introduction of energy-saving devices and improved efficiency of vessel operations by increasing the use of slow streaming. - Fuel conversion is a key to achieving the net zero, and we believe that GHG emissions will continue to steadily decrease as we accelerate our efforts to reduce and eliminate carbon, such as by introducing LNG-fueled ships by around 2030 and then new technologies such as ammonia- and hydrogen-fueled zero-emission ships thereafter. We think dialogues with ship owners are the key to replacing ships with the aim of reducing GHG emissions, and it will be also supported by improving operational efficiency with the use of digital technology.	 Masaki Masuda

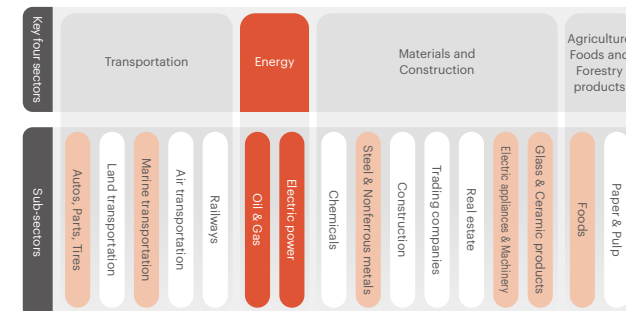
For details of the risk and opportunity analysis by the analysts, please refer to Appendix 2: Analysis of sub-sectors belonging to key 4 sectors (P55, 56).



(3) Analysis of key 4 sectors by our analysts

Energy sector

- We analyzed Oil & Gas and Electric power sub-sectors in the Energy sector.
- The energy sector relies most of its business on fossil energy and is a sector with large GHG emissions. Although there is a difference in the progress speed to lower GHG emissions depending on industries, we believe that initiatives such as expanding non-fossil and renewable power sources, promoting better efficiency in energy use and strengthening measures for next-generation fuels hold the key.



Sub-sectors	Key drivers to reduce GHG emissions that analysts consider	Analyst
Oil & Gas 	• We believe that the oil and gas sector is currently not making progress in cutting GHG emissions. In the oil industry, although refineries are promoting energy conservation and fuel conversion, it will likely take time for the effects to appear. In the gas industry, demand continues to shift to natural gas as a transitional fuel. • It is likely to be hard to significantly reduce GHG emissions toward 2030. Still, we believe it is possible to encourage them to curb emissions through dialogues. We plan to encourage the gas industry to increase the proportion of renewable energy sources and accelerate the practical use of e-methane, which is a clean fuel. Regarding the oil industry, we plan to hold dialogues about strengthening efforts on next-generation fuels such as SAF and hydrogen and utilizing highly reliable offset measures toward 2030.	 Katsuyuki Nakai
Electric power 	• Reduction in GHG emissions in the electric power sector is generally on track. This is because nuclear power generation restarted, besides expansion of the use in highly efficient thermal power generation and renewable energy. • Although construction of data centers will likely increase demand for electricity in the future, we believe it is possible to achieve the 2030 reduction target. Through dialogues with companies, we plan to promote companies to further expand non-fossil fuels such as solar power and offshore wind power generation and improve efficiency of energy usage by using energy storage technology and next-generation smart meters. We will also work to support Japan's energy policy that promotes decarbonization.	

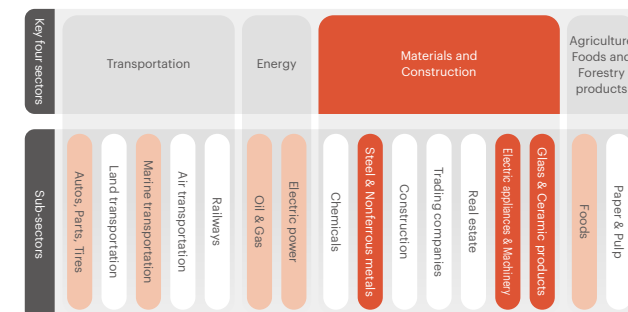
For details of the risk and opportunity analysis by the analysts, please refer to Appendix 2: Analysis of sub-sectors belonging to key 4 sectors (P57, 58).

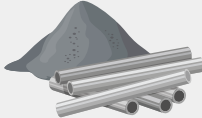


(3) Analysis of key 4 sectors by our analysts

Materials and Construction sector

- Of the seven sub-sectors in the Materials and Construction sector, the page analyzed the Steel & Nonferrous metals, Electric appliance & Machinery and Glass & Ceramic products.
- The materials and construction sector is a sector with large GHG emissions, since it uses fossil fuels as an energy source to produce materials. Although there are differences depending on industries, we believe that it is important to take measures such as optimizing production facilities, making products more energy efficient through using renewable energy and technological innovation and decarbonization in the entire sector including supply chains.



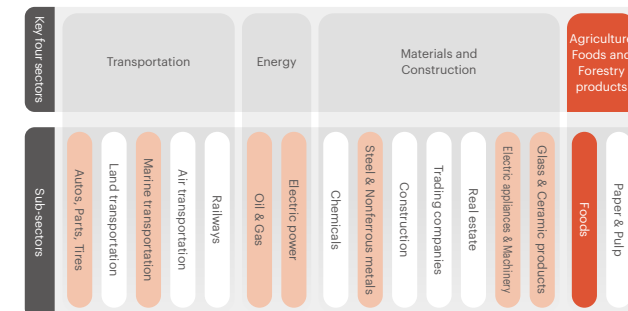
Sub-sectors	Key drivers to reduce GHG emissions that analysts consider	Analyst
Steel & Nonferrous metals 	The steel sector is making progress in lowering emissions in conjunction with optimizing plant capacity (reduction in production). Considering future plant suspension plans, we believe that achieving blast furnace targets for FY 2030 is within range. Since implementation of low-carbon technology will peak in the 2030s, when existing equipment will enter a period of renewal, we believe that the increased burden of investment and development as well as rising operational costs will fully begin in accordance with this trend. We plan to hold dialogues on issues such as reviewing steel grades produced domestically, selective investments, social sharing of costs and the prospects of investment collection. As for nonferrous metals, besides short-term issues such as fuel conversion and the use of renewable energy, we plan to discuss long-term themes including commercialization of recycling-specified smelting technology and expansion of downstream businesses.	 Akira Tanaka
Electric appliance & Machinery 	- In the electric appliance and machinery sector, we believe reduction of GHG emissions are generally progressing as planned. Leading companies are bringing forward their net-zero targets, and some are accelerating reduction plans. - We aim to contribute to power conservation in electronic devices and decarbonization of autos through technological innovation. By supplying components and technology, it is possible to contribute to expanding the use of renewable energy. Some semiconductor-related companies are also rushing to respond to data centers that are rapidly increasing. - There are companies that do not include Scope 3 into their reduction target that cannot be reduced by its own efforts. Through future dialogues, we plan to accelerate reduction of GHG emissions in the entire sector including supply chains.	 Masashi Yazaki
Glass & Ceramic products 	- Companies are making progress in reducing emissions, and achieving their 2030 targets is within sight. Glass-related companies are making progress in measures to reduce energy-derived emissions (electrification of molten heat sources and clean electrification), while cement-related companies are also required to reduce process-derived emissions (electrification is impossible), and capital investment to make conversion to alternative fuels such as wood biomass is continuing. Still, it is taking time for the effects to appear. - After 2030, it is essential to have breakthrough technologies for carbon neutrality (fuel/energy alternatives and CO₂/waste recycling), and we plan to discuss the implementation status of GX strategy and promotion of transition plans including the Scope 3) in accordance with it, as well as proposals and promotions for the introduction of demand-side measures (including providing incentives to adopt construction materials).	 Norihiko Kawachi

For details of the risk and opportunity analysis by the analysts, please refer to Appendix 2: Analysis of sub-sectors belonging to key 4 sectors (P59, 60, 61).

(3) Analysis of key 4 sectors by our analysts

Agriculture, Foods and Forestry products sector

- Of the two sub-sectors of the Agriculture, Foods and Forestry products sector, the page analyzed Foods.
- For the agriculture, foods and forestry products sector, climate change is feared to have various impacts not only through changes in crop growth and suitable cultivation areas, but also through changes in water resources and natural ecosystems. The shift to renewable energy and introduction of energy-saving equipment are important issues. We also believe that it is important to identify issues at each stage and promote measures, because food supply chains are complicated.



Sub-sectors	Key drivers to reduce GHG emissions that analysts consider	Analyst
Foods 	• In the foods sector, the reduction of emissions associated with the Scope 1 and 2 are progressing smoothly. The background for this is efforts including a shift to renewable energy such as solar power, the use of solar-power equipment under the power purchase agreement (PPA) model, adoption of the latest energy-saving equipment, promotion of the use of recycled materials, conversion to LED lighting and the purchase of credit. We believe many companies are expected to achieve their interim targets (by 2030 for most of the companies). • Although prospects for reducing emissions at companies' own sites are faring well, it is not easy to achieve the net zero including the entire supply chain. We will start by dealing with upstream parties, such as improving breeding that is resistant to heat waves and devising cultivation methods that are less susceptible by weather conditions. We will then work toward a modal shift* in logistics, building a joint distribution network, introducing electric vehicles, eradicating losses during production and further developing refillable containers. We believe that deepening collaborative dialogues throughout the supply chain is the absolute condition to achieve the target. We plan to cooperate in correctly understanding the issues facing the entire supply chain and introduce examples from global companies and other industries. We will keep engaging in dialogues to support the challenge that can afford no further delay.	 Hiromi Takehisa

For details of the risk and opportunity analysis by the analysts, please refer to Appendix 2: Analysis of sub-sectors belonging to key 4 sectors (P62).

* The conversion of freight transport by truck and other motor vehicles to the use of railways and ships, which have a smaller environmental impact.

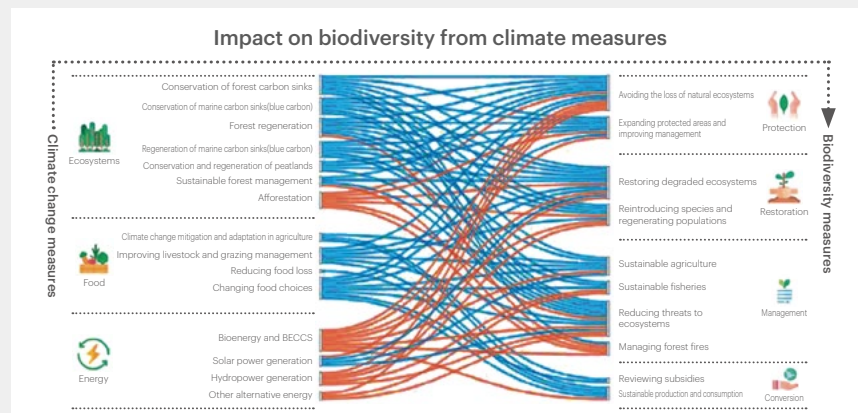


(4) LCA analysis and engagement plans

LCA analysis in collaboration with academia

Issue recognition

Environmental and social problems are intricately intertwined. For example, when we take measures against climate change issues, synergies for various aspects of nature and society are created (certain measures have a positive impact on another problem). Concurrently, it is important to consider the trade-off relationship (certain measures have a negative impact on another problem). Specifically, measures aimed for decarbonation including the energy system calls for additional investments. It leads to reduction in fossil fuels, creating synergies in terms of job creation and health. On the other hand, climate change measures by producing biomass energy may require deforestation and tree planting, which may have a negative trade-off impact on a loss of the natural ecosystem or restoration of the ecosystem. Under circumstances where various issues are occurring at the same time, investors are starting to be questioned how they will contribute to resolving these problems.



The blue line indicates synergies, and the orange line indicates trade-offs.

Source: Mitsubishi UFJ Trust and Banking created the document, based on the "IPBES-IPCC Co-Sponsored Workshop Report on Biodiversity and Climate Change: Translation and Explanation by IGES."

Achievements and the initiatives status

The start of joint research with Waseda University

As one of measures to deal with the situation where various problems are intricately intertwined, Mitsubishi UFJ Trust and Banking uses the analysis result of the life cycle assessment (hereinafter referred to as "LCA"), which quantitatively evaluates environmental load on the entire life cycle that covers from procurement of product raw materials to production, sales, disposal and recycling, in actual engagement with companies. In order to analyze its achievements, we have begun joint research with the Professor Norihiro Itsubo Laboratory of Waseda University (Faculty of Science and Engineering, School of creative Science and Engineering) since August 2024. In the situation where various environmental problems including climate change and biodiversity are intricately intertwined and hard to be solved at the same time, it is increasingly important to quantitatively identify hot spots (material ESG issues) in companies' life cycles, share LCA results with the companies as well as promote and support companies' initiatives to resolve issues. We are the first Japanese asset management institution to utilize LCA analysis results in engagement practices with companies and analyze the results.

(Press release: https://www.tr.mufg.jp/ippan/release/pdf_mutb/240801_3.pdf)



Masahiro Kato
Fellow, MUFG AM Sustainable Investment

We utilize LCA analysis results in engagement with companies. We repeat constructive dialogues with companies, discussing which materials issues have higher priority that match their business models and strategies and its degree of impact. This is aimed to contribute to resolving environmental and social problems and improving corporate value. We believe contributing to solving these issues and achieving "results" leads to sustainable corporate "growth" and improvement of economic investment returns.



Natural Capital and Biodiversity

- (1) Integrating climate and nature
- (2) Roles fulfilled by financial institutions
- (3) MUFG AM's future initiatives
- (4) MUFG AM Portfolio analysis

(1) Integrating climate and nature

Climate change and the loss of natural capital/biodiversity

Climate change issues are also called climate crisis, and this is urgent issue on a global scale that cannot be avoided by all creatures living on the earth. The loss of natural capital^{*1}/biodiversity^{*2} is another important issue that we must address. Nature and living organisms are the essential foundations for a sustainable society and economy, and their loss affects all areas, including economic activities and social life.

The loss of climate change and natural capital/biodiversity is intricately intertwined. Climate change causes changes in environmental conditions such as temperature, precipitation, sea ice extent and sea water temperature and levels. These changes may lead to shifts, reductions, or disappearance of growing areas and extinction of species, resulting in loss of biodiversity and a degradation of ecosystem services.^{*3} For example, alpine plants are said to be at high risk of decline, because there are few places at high elevations that provide low temperatures and refuge when the temperature rises. In addition, the destruction of forests, coastal areas and oceans may lead to climate changes by reducing forests and areas with seaweed, which are sinks for greenhouse gases.

Explanation of sustainability-related terms

*1 Natural capital

It refers to the stock of all resources occurring in the natural world including living and non-living or things, such as forests, soil, water, air and mineral resources. It is considered part of the capital that supports the socio-economy, alongside human and financial capital, as it brings benefits to people through the "ecosystem services".

*2 Biodiversity

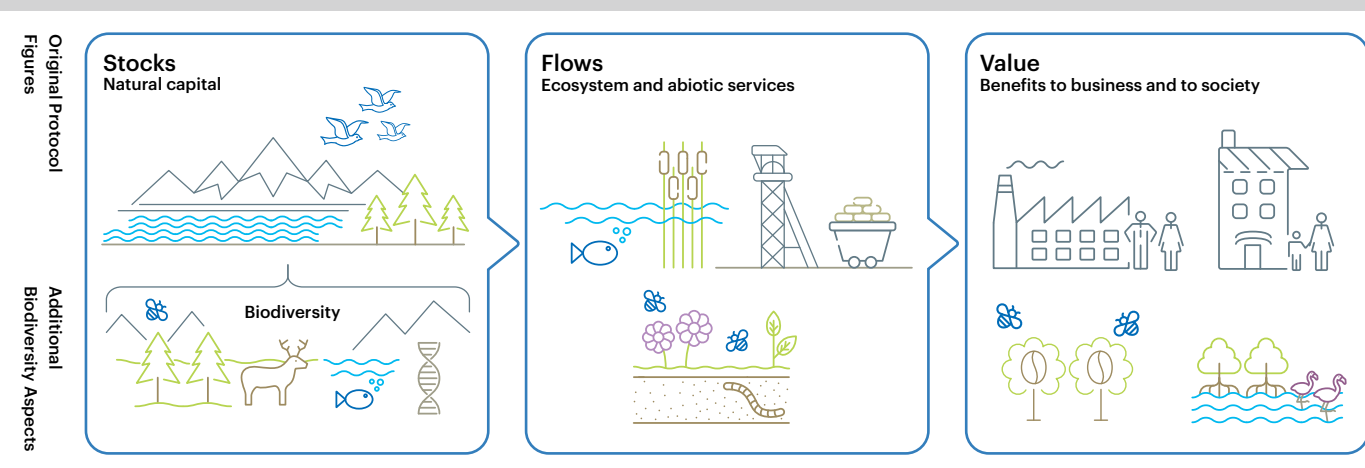
It refers to the varieties among all living things on earth, from animals such as humans to microorganisms such as plants and fungi. Biodiversity has a role to keep our natural capital healthy and stable by fostering ecosystems, increasing nature's resilience and lowering risks to ecosystem services that we depend on.

*3 Ecosystem services

It refers to the flow of benefits from ecosystems to humans (e.g., timber, fiber, pollination, water regulation, climate regulation, recreation, mental health benefits, etc.).

(Source) Prepared by MUFG AM based on the "Guidelines for Private Sector Engagement in Biodiversity (3rd Edition)" by the Ministry of the Environment

Relationship between biodiversity and natural capital stock, flow and value (Natural Capital Protocol 2016)



(Source) Prepared by MUFG AM based on "Integrating Biodiversity Into Natural Capital Assessments" by Capitals Coalition

(1) Integrating climate and nature

Responses to Climate Change and Conservation of Natural Capital/Biodiversity

International cooperation and collaboration

Climate and nature/organisms have no boundaries like national borders, and no single country or company can be fully effective in working alone to resolve the problem. In order to curb the loss of natural capital/biodiversity, it is necessary for the entire international community to cooperate and collaborate.

Global efforts regarding climate change and the loss of natural capital/biodiversity have been progressed under the United Nations Framework Convention on Climate Change (UNFCCC)*¹ adopted at the Earth Summit (United Nations Conference on Environment and Development) in Rio de Janeiro in 1992 and the Convention on Biological Diversity (CBD).^{*2} These two treaties are closely related. In addition, the Glasgow Climate Pact, agreed at the 2021 United Nations Climate Change Conference, the 26th session of the Conference of the Parties (COP26), states “Recognizing the interlinked global crises of climate change and biodiversity loss, and the critical role of protecting, conserving and restoring nature

and ecosystems in delivering benefits for climate adaptation and mitigation.”

Multi-faceted and integrated approach

In climate change response and conservation of natural capital/biodiversity, it requires caution that promoting one response may produce synergies (positive effects) on the other, or trade-offs (negative factors) may occur. For example, growing mangroves in coastal areas enriches the ecosystem by attracting fish and also increases absorption of greenhouse gasses, creating synergies for climate change. Furthermore, development of renewable energy such as biofuels can be trade-offs for conservation of natural capital/biodiversity, since it may lead to deforestation depending on the method of introduction. When addressing climate change and promoting natural capital/biodiversity conservation, we need a multifaceted and integrated approach with being conscious of building and maximizing synergies and curbing trade-offs.

The trend toward understanding and responding to climate change and natural

capital/biodiversity holistically is also seen in the design philosophy of the Taskforce on Nature-related Financial Disclosure (TNFD) for companies. The TNFD is designed based on the structure of the Task Force on Climate-Related Financial Disclosures (TCFD), and it gives considerations in order to make companies easier to understand and disclose climate and natural capital/biodiversity together.

At the Convention on Biological Diversity, the 15th session of the Conference of the Parties (COP15) in 2022, the “Kunming-Montreal Global Biodiversity Framework (GBF),” a new global framework on natural capital/biodiversity, was adopted, and the vision and goals to be achieved by 2050 as well as

missions and targets (23 targets) by 2030 were established.

The framework includes considerations such as promoting collaboration with other treaties, agreements and frameworks such as the United Nations Framework Convention on Climate Change, and respecting the contributions and rights of indigenous people and local communities. In addition, with awareness of the interrelationship between climate change and natural capital/biodiversity, the targets include efforts to promote the conservation of both integrally. The focus of attention will be the development of specific strategies and action plans for each country to achieve the “Kunming-Montreal Global Biodiversity Framework (GBF).”



*1 United Nations Framework Convention on Climate Change (UNFCCC): A treaty that aims to stabilize the concentration of greenhouse gases in the atmosphere and establish an international framework to deal with climate change.

*2 Convention on Biological Diversity (CBD): A treaty that aims for the conservation of biological diversity, a sustainable use of biological elements and fair and equitable distribution of gains from the use of genetic resources.

(1) Integrating climate and nature**Kunming-Montreal Biodiversity Framework (GBF)
Global targets for 2030****1. Reducing threats to biodiversity**

- Target 1** Plan and Manage all Areas To Reduce Biodiversity Loss
- Target 2** Restore 30% of all Degraded Ecosystems
- Target 3** Conserve 30% of Land, Waters and Seas
- Target 4** Halt Species Extinction, Protect Genetic Diversity, and Manage Human-Wildlife Conflicts

- Target 5** Ensure Sustainable, Safe and Legal Harvesting and Trade of Wild Species
- Target 6** Reduce the Introduction of Invasive Alien Species by 50% and Minimize Their Impact
- Target 7** Reduce Pollution to Levels That Are Not Harmful to Biodiversity
- Target 8** Minimize the Impacts of Climate Change on Biodiversity and Build Resilience

2. Meeting people's needs through sustainable use and benefit-sharing

- Target 9** Manage Wild Species Sustainably To Benefit People
- Target 10** Enhance Biodiversity and Sustainability in Agriculture, Aquaculture, Fisheries, and Forestry
- Target 11** Restore, Maintain and Enhance Nature's Contributions to People

- Target 12** Enhance Green Spaces and Urban Planning for Human Well-Being and Biodiversity
- Target 13** Increase the Sharing of Benefits From Genetic Resources, Digital Sequence Information and Traditional Knowledge

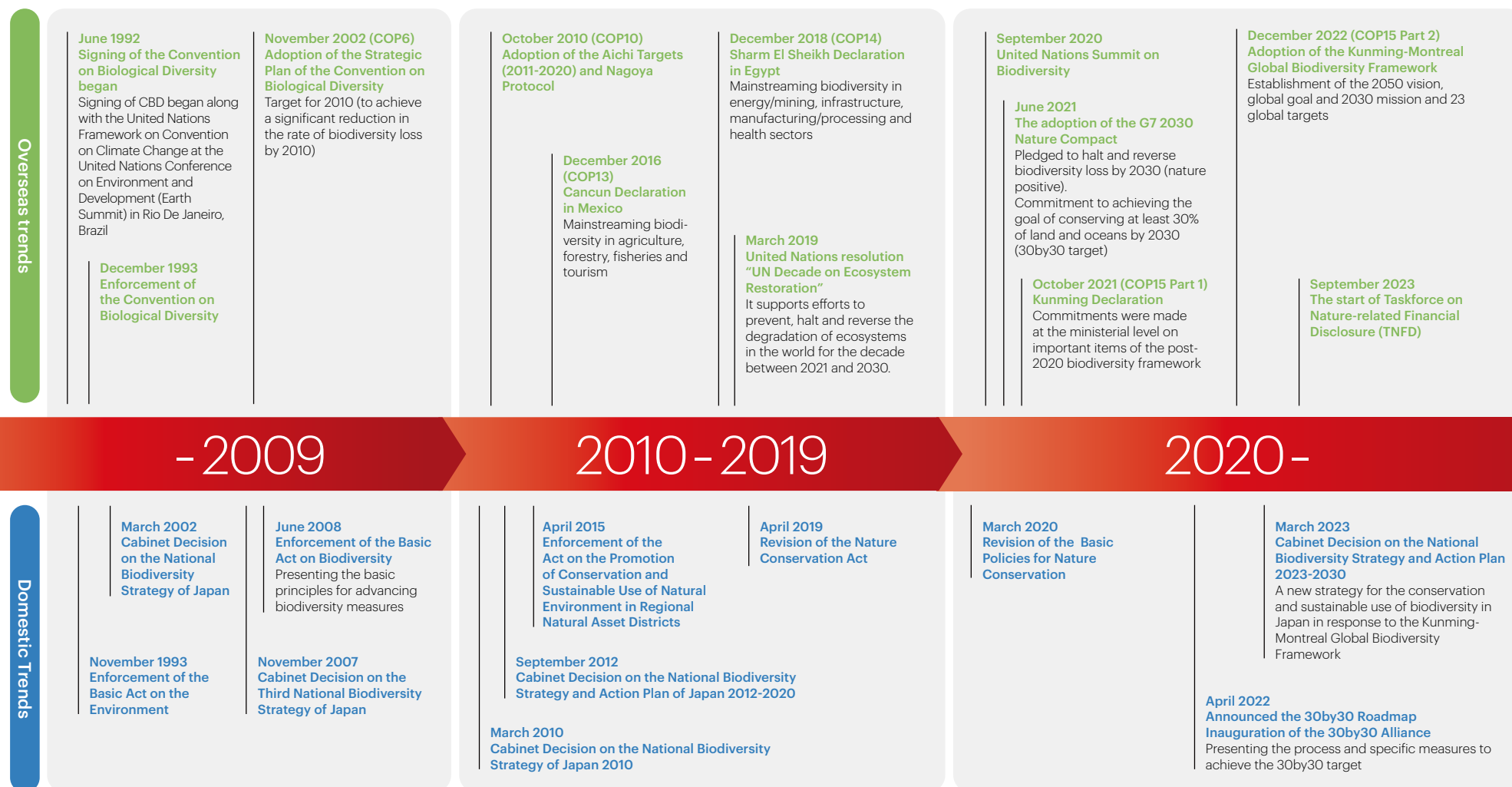
3. Tools and solutions for implementation and mainstreaming

- Target 14** Integrate Biodiversity in Decision-Making at Every Level
- Target 15** Businesses Assess, Disclose and Reduce Biodiversity-Related Risks and Negative Impacts
- Target 16** Enable Sustainable Consumption Choices To Reduce Waste and Overconsumption
- Target 17** Strengthen Biosafety and Distribute the Benefits of Biotechnology
- Target 18** Reduce Harmful Incentives by at Least \$500 Billion per Year, and Scale Up Positive Incentives for Biodiversity

- Target 19** Mobilize \$200 Billion per Year for Biodiversity From all Sources, Including \$30 Billion Through International Finance
- Target 20** Strengthen Capacity-Building, Technology Transfer, and Scientific and Technical Cooperation for Biodiversity
- Target 21** Ensure That Knowledge Is Available and Accessible To Guide Biodiversity Action
- Target 22** Ensure Participation in Decision-Making and Access to Justice and Information Related to Biodiversity for all
- Target 23** Ensure Gender Equality and a Gender-Responsive Approach for Biodiversity Action

(1) Integrating climate and nature

Domestic and overseas trends regarding natural capital/biodiversity



(2) Roles fulfilled by financial institutions

Initiatives to encourage behavioral change in Investee Companies and Borrowers

The role of financial institutions

As mentioned earlier, the loss of natural capital/biodiversity affects all areas, including economic and social activities, and also affects mitigation of climate change. In response to this issue, financial institutions play an important role to encourage investee companies to change their behaviors by providing support to formulate transition plans.

In light of potential risks that the loss of natural capital/biodiversity poses to financial assets, MUFG AM is working to gain knowledge on the interrelationship between climate change and natural capital/biodiversity, countermeasures and international policy trends. MUFG AM participated in discussions on global policies regarding

environmental problems at the sixth session United Nations Environment Assembly (UNEA6) held in Nairobi, Kenya in February 2024. Through discussions, we built relationships with the United Nations Environment Programme (UNEP) and government/public sectors to reaffirm the necessity to comprehensively address climate change and natural capital/biodiversity.

Discussions at expert-roundtables

MUFG AM is also working on gaining knowledge through roundtables with experts. In October 2024, we co-hosted an expert roundtable with the Economist Impact on the theme of “Nature, Climate and Ocean –Strengthening Response to Investors and Companies.”

When opening an expert roundtable, Juan Camilo Gomez Alvarado, representative of Colombia at the Embassy of Colombia in Japan who co-chaired the 16th meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD COP16), sent the message that animals and plants are in serious danger of extinction, and it is important to strengthen the relationship between government and the private sector as well as to bring citizens and society together to conserve natural capital/biodiversity.

At the roundtable, discussions on the Taskforce on Nature-related Financial Disclosure (TNFD) have also been made. Companies are making progress in identifying nature dependencies, impacts, risks

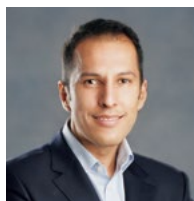
and opportunities. However, there is a lack of standards and guidance for identification methods, and financial institutions face high hurdles to analyze the dependencies, impacts, risks and opportunities of their own investment and loan portfolios. Moreover, the lack of data to measure the dependencies, impacts, risks and opportunities also hinders the analysis, and addressing this data shortage is also a challenge.

Based on the discussions made at the roundtable, we believe that financial institutions can collaborate with investee companies and play an important role when monolithically dealing with the dependencies, impacts, risks and opportunities regarding climate and nature. MUFG AM also plans to proactively address them.



(2) Roles fulfilled by financial institutions

Message from participants of the expert-roundtable



Opening speech

Mr. Juan Camilo Gomez Alvarado

Embassy of Colombia in Japan / Commercial Counsellor
(Director of ProColombia Japan and Asia Leader)

It is an honor to speak about COP16, which was held in October in Cali, Colombia. This conference arrived at a crucial time, bringing together delegations from over 176 countries to discuss biodiversity and the global progress on the commitments made during the COP15 in Montreal (2022).

There were three primary objectives that guided our collective action to address the triple planetary crisis: (1) to address biodiversity loss with the same urgency we apply to achieving carbon neutrality. This is not just a global issue but a local responsibility; (2) to strengthen the relationship between governments, the private sector, and the environment, which is reflected in this year's COP16 theme: "Peace with Nature."; and (3) integration of civil society. We believe the global community must engage in discussions around nature and biodiversity issues. Leadership on these issues requires more than just words; it demands concrete actions.

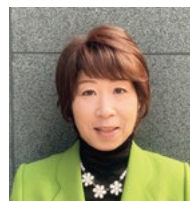


Message from chairperson of the expert roundtable

Mr. Charles Goddard

Economist Impact / Editorial Director

As the climate and nature crises unfold in tandem, financial institutions—and asset management in particular—can play a vital role engaging the companies they invest in to address their climate and nature impacts and risks, and opportunities, in an integrated way. It no longer makes sense to think of climate change and nature loss as separate; the two crises are deeply connected, as are the solutions.



Message from a member of the expert roundtable

Prof. Sayuri Shirai

Keio University

Efforts by major companies to take measures against climate change and natural capital are progressing globally, and more organizations are also using several indicators to score companies.

However, there is a difference between climate change and natural capital. Climate change has greenhouse gas (GHG) as a globally common measure, and disclosures are progressing in line with the GHG protocol, but there are no common or clear disclosure standards for natural capital.

Another difference is that with regard to greenhouse gas, the International Energy Agency (IEA) and other organizations have estimated a carbon price that is consistent with the 1.5°C emission pathway, so companies can use such prices to book emission costs to make judgement on capital investment. However, natural capital does not have appropriate prices, making it difficult to analyze the impact and scenario on a company's finances.

(2) Roles fulfilled by financial institutions

Discussion at the expert roundtable

Putting natural capital on balance sheet

New frameworks such as TNFD are vital tools in helping financial institutions and their clients transition towards nature positive and net zero objectives. But without also putting nature on the balance sheet their utility is likely to be limited:

- **Pricing natural capital**
Under the current economic system, natural capital is not properly priced. Nature and its services are often taken as free, driving a deep decline in natural capital. The lack of a price for natural capital also means insufficient investment in nature;
- **Investment flow**
Without an assignment of monetary value, investment will not flow into natural assets. This will greatly hinder rebuilding natural systems, and restoring and regenerating nature. Without such investment, we risk further undermining natural systems and put at risk planetary boundaries;
- **Turning nature into an investable asset**
To treat nature as an investable asset on balance sheets, and ensure natural capital becomes part of economic decision-making processes, will require systemic changes. It will also require accounting and financial system reforms at scale. Finance has a vital role to play;
- **Holistic thinking**
The global environmental dialogue is shifting. Addressing climate and nature separately is no longer fit for purpose. The climate and nature crises are profoundly interconnected, as are the solutions.



Ocean health and economy

Among participants there was consensus that Japan's financial institutions were lagging behind their global counterparts in understanding the importance of ocean health to the wider economy as well as to investments and business activities. The ocean has not been a lens through which financial institutions evaluate impacts, risks and opportunities in their investment and lending portfolios. Participants were nevertheless keen to discuss:

- **The declining state of the ocean**
Human impacts on the ocean—particularly climate change impacts, over-extraction of living resources and pollution—and the growing industrialisation of the seas, are damaging vital marine ecosystems and undermining the health of the ocean;
- **The ocean's role in planetary health**
Healthy ocean is vital to the stability of wider earth systems. The ocean regulates climate, provides 50% of the oxygen we breathe, and has absorbed 90% of excess heat caused by anthropogenic warming and 30% of the excess carbon dioxide. The ocean as a system is deeply stressed, and its resilience is being undermined;
- **The ocean has enormous economic value and importance, both its estimated annual contribution to the global economy (US\$2.5trn), and its estimated value as a natural asset (US\$25trn) supporting sectors like food, transportation, energy and tourism. Up to 3bn people rely on the ocean for their livelihoods;**
- **Risks for the private sector**
Research suggests listed companies the world over could face trillions of dollars in value at risk over the next decades due to their dependence or impact on the ocean;
- **Investors have a key role. Investors need to engage with their client companies to assess how they manage ocean-related risks and opportunities, and how they plan to mitigate potential loss of value related to ocean dependencies.**



(3) MUFG AM's future initiatives

Effective engagement

MUFG AM has set conservation of natural capital/biodiversity as its important activity theme as well as climate change. We plan to consider climate and natural capital/biodiversity monolithically, conduct analyses of portfolios and important sectors, and formulate and execute effective engagement.

Besides domestic corporate engagement, we plan to gradually strengthen global engagement. For domestic engagement, we gain knowledge through guidance based on scientific evidence from academia and discussions with domestic and overseas policy authorities and build up our engagement records. We will utilize this experience in global engagement and

aim to continue to deliver high quality and effective engagement.

As specific moves to gain knowledge from academia, in addition to joint research with a domestic university's laboratory, we have begun discussions on joint research with Cambridge University's Institute for Sustainability Leadership. We plan to gain advanced and specialized knowledge at a global level regarding climate change and natural capital/biodiversity and utilize it for engagement.

There are also cases where the knowledge gained is already being used for engagement. Mitsubishi UFJ Trust and Banking, part of MUFG AM, has established and

is operating First Sentier MUFG Sustainable Investment Institute with its asset management subsidiary, First Sentier Investors. The institute researches industry trends and market interests in sustainable investment and compiles them into reports, which are available to the public on its website. In the natural capital/biodiversity area, First Sentier has already published reports that analyze microplastics and microfibers, which are issues related to above ground and ocean pollution, and the status of TNFD disclosed by global companies. The institute uses these reports in actual corporate engagement and encourages corporate transformation.

Once again, climate change and the loss of natural capital/biodiversity are challenges that must be addressed by the entire world monolithically. That is why we are required to carry out activities and policy proposals that can be transmitted on a global scale.

MUFG AM aims to contribute to the realization of sustainability and lead to sustainable growth and improvement of economic investment returns for investee companies, by constantly understanding global trends, expanding its knowledge and carrying out highly effective engagement.



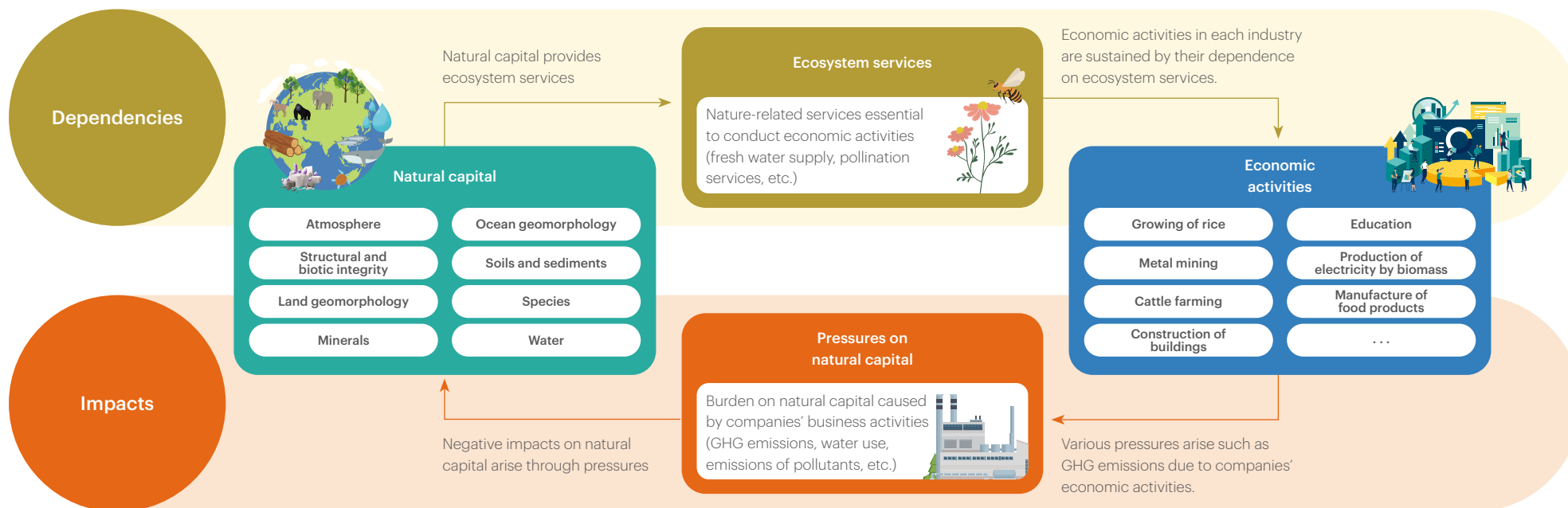
Natural Capital and Biodiversity

- (1) Integration between climate and nature
- (2) Roles fulfilled by financial institutions
- (3) MUFG AM's future initiatives
- (4) MUFG AM Portfolio analysis**



(4) MUFG AM Portfolio analysis

Overview of ENCORE framework



(Source) Prepared by MUFG AM based on "ENCORE (Exploring Natural Capital Opportunities, Risks, and Exposure)," a nature-related analysis tool.

Exploring Natural Capital Opportunities, Risks, and Exposure (ENCORE) is a tool to identify the degree of a specific industry's dependence on natural capital (dependencies) and the degree of impacts on natural capital from its activities. It is a tool that visualizes these two aspects and is a method recommended by the Task Force on Nature-related Financial Disclosures (TNFD).

Dependencies indicate the degree of dependence by industry on essential ecosystem services (e.g. freshwater supply, pollination services, etc) for each industry to continue its economic activities. It clarifies the Intensity of dependence on natural capital. For example, agriculture highly depends on pollination services and water resources that are necessary

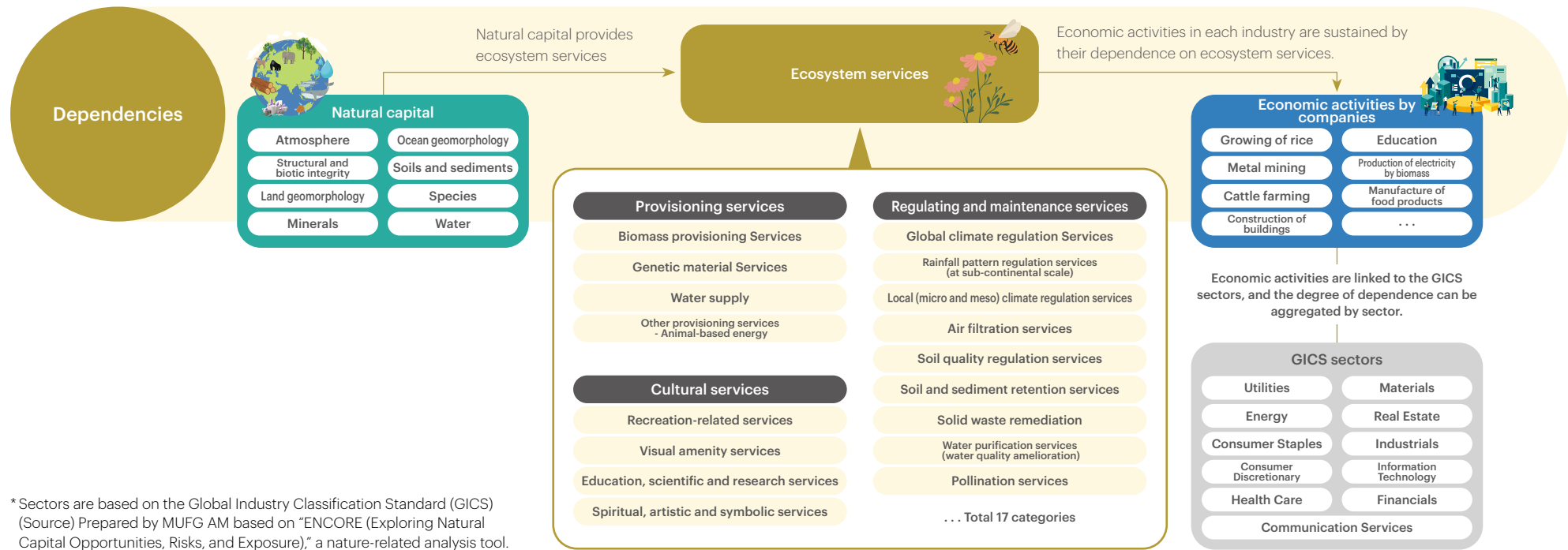
for crop growth, and the impairment of these ecosystem services may pose serious business continuity risks.

On the other hand, impacts indicate the degree to which a specific industry is adding pressure on natural capital from economic activities (e.g. GHG emissions, water use, emissions of pollutants, etc.) and clarifies the degree of impact on natural capital by industry. For example, the pressure of increasing pollutants adds loads on natural capital including soils and water and causes deterioration.

We analyze nature-related risks hidden in our portfolio by using the ENCORE and utilize it for effective dialogues with companies.

(4) MUFG AM Portfolio analysis

Overview of Dependencies



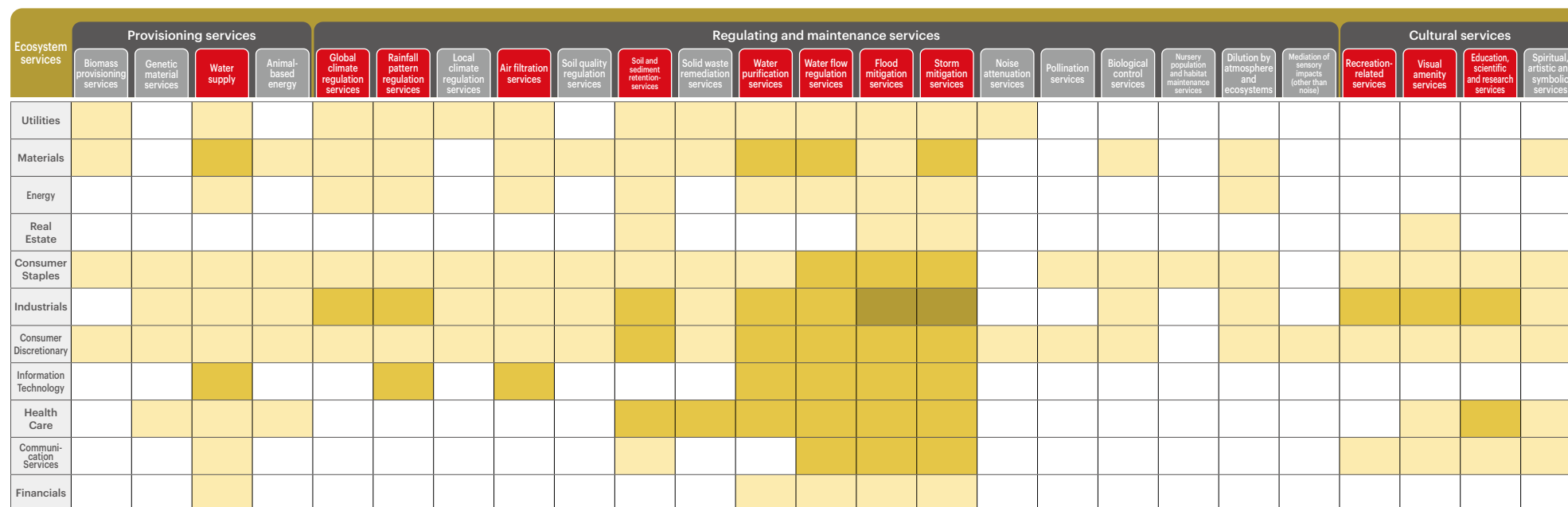
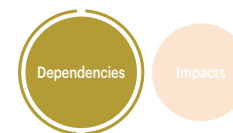
The above chart shows how ENCORE aggregates and provides the "degree of dependence on ecosystem services by specific industries." The natural capital shown in the diagram on the left side consists of eight factors including atmosphere, structural and biotic integrity and water, and these support economic activities of each industry (top right of the diagram) through provision of ecosystem services such as biomass supply and water supply. For example, the economic activity of rice cultivation is strongly dependent on ecosystem services, such as water supply and pollination services, and as a result, it is strongly dependent on natural capital such as water and species that are ultimately linked to those services.

The ENCORE ranks the degree of dependence on individual ecosystem services in a five-grade scale from "very low" to "very high" (*six grades when including "not applicable") by aggregating the degree of dependence by all 163 sub-industries belonging to the GICS sector. This indicates how dependent certain industries are on ecosystem services and natural capital.

MUFG AM aggregates and discloses the degree of impact across 11 GICS sectors by compiling data from ENCORE.

(4) MUFG AM Portfolio analysis

Analysis results for “Dependence”



* Sectors are based on the Global Industry Classification Standard (GICS)

(Source) Prepared by MUFG AM based on “ENCORE (Exploring Natural Capital Opportunities, Risks, and Exposure),” a nature-related analysis tool.

Dependence on ecosystem services Very Low Very High

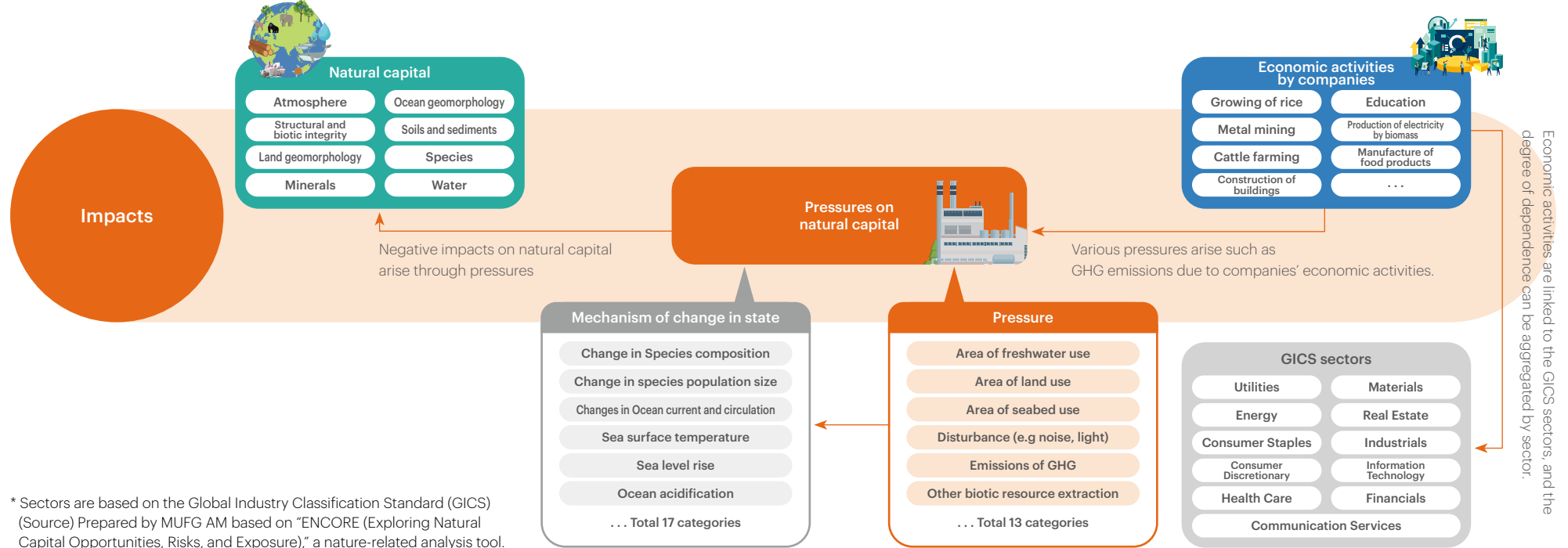
The above chart aggregates the dependence of companies in MUFG AM’s portfolio on ecosystem services and evaluates them across GICS sectors. The tally analyzes the evaluation of the degree of dependence from Very Low to Very High, taking into account the asset weighting of each sector in the portfolio.

We chose to analyze ‘ecosystem services’ rather than ‘natural capital’ because economic activities are supported not by natural capital itself, but by specific ecosystem services it provides. We believe that effective dialogues with investee companies can be achieved not by merely identifying their dependence on natural capital, but by focusing on specific ecosystem services they rely on. For example, instead of just recognizing dependence on water, it is important to analyze their reliance on water purification services.

The analysis of the degree of dependence revealed that water purification services, water flow regulation services, flood mitigation services and storm mitigation services are the ecosystem services that many sectors particularly depend on, and that the industrials/consumer discretionary/information technology/health care sectors strongly depend on many ecosystem services. Specifically, economic activities of the industrial sectors with high dependence on flood mitigation services and storm mitigation services include the manufacturing of vehicles and buildings, and stable operation of factories is essential. The degree of dependence varies depending on the characteristics of economic activities. However, overall, it appears that the dependence on water-related ecosystem services is relatively high.

(4) MUFG AM Portfolio analysis

Overview of “Impacts”



“Impacts” on natural capital arise through “pressures” brought about by economic activities and “mechanisms of change in state” brought about by pressures.

“Pressures” in the middle section of the diagram refer to the burdens that economic activities by companies place on natural capital, such as area of land use and GHG emissions. These various pressures lead to mechanisms of change in state, which in turn affect natural capital. This represents the sequens of ‘impacts’ on natural capital as defined by ENCORE.

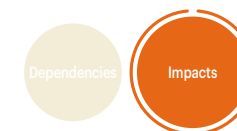
Regarding the flow, we list “production of electricity by biomass” as an example. First, when procuring wood for biomass power generation, a pressure arises in the form of the “use

of other biotic resources.” If excessive timber harvesting occurs, a mechanism of structural change called a “change in species population size” may activate. For example, a change in the number of microorganisms living in soil may have a negative impact on ‘soil’ as a form of the natural capital.

The ENCORE framework visualizes the impact on natural capital arising from specific economic activities through a series of such flows. MUFG AM aggregates and discloses the degree of impact across 11 GICS sectors by compiling data from ENCORE.

(4) MUFG AM Portfolio analysis

Analysis results for “impacts”



Pressures	Area of freshwater use	Area of land use	Area of seabed use	Disturbance (e.g., noise, light)	Emissions of GHG	Emissions of Non-GHG Air Pollutants	Emissions of nutrient soil and water pollutants	Emissions of toxic soil and water pollutants	Generation and release of solid waste	Introduction of invasive species	Other abiotic resource extraction	Other biotic resource extraction	Volume of water use
Utilities													
Materials													
Energy													
Real Estate													
Consumer Staples													
Industrials													
Consumer Discretionary													
Information Technology													
Health Care													
Communication Services													
Financials													

* Sectors are based on the Global Industry Classification Standard (GICS)

(Source) Prepared by MUFG AM based on “ENCORE (Exploring Natural Capital Opportunities, Risks, and Exposure),” a nature-related analysis tool.

Pressure level Very Low Very High

The above chart aggregates the degree of impact of companies in MUFG AM’s portfolio on ecosystem services and evaluate them across 11 GICS sectors. In this analysis, we have taken into account the asset composition ratio of each sector and have assessed the impact, ranging from Very Low to Very High.

We chose to analyze “pressure” rather than “natural capital” in the report, because the impact on natural capital from economic activities of companies can be clearly visualized, making it more understandable and allowing us to directly use it for our dialogues with companies. The analysis of the degree of the impact revealed the materials, industrials, consumer discretionary, information technology and health care sectors are creating a lot of pressures, and many sectors add pressure especially on disturbance (e.g., noise, light), GHG emissions, emissions of toxic soil and water pollutants and water use.

The analysis shows that the information technology sector adds strong pressure especially on disturbance (e.g., noise, light) and toxic soil and water pollutants. Pressure in the information technology sector gets higher, because the process of economic activities to make peripheral products such as computers and chips generate noise and light and emit chemical substances.

As a result of analyzing both aspects of “dependencies” and “impacts,” the sectors with a high degree of “dependence” on natural capital also tend to have a high degree of “impact.” This is because economic activities that are more dependent on natural capital tend to have a bigger impact on natural capital in the process. For that reason, by understanding both dependencies on ecosystem services and pressures from economic activities, rather than focusing solely on one aspect, we can gain a more accurate understanding of natural capital-related risks.

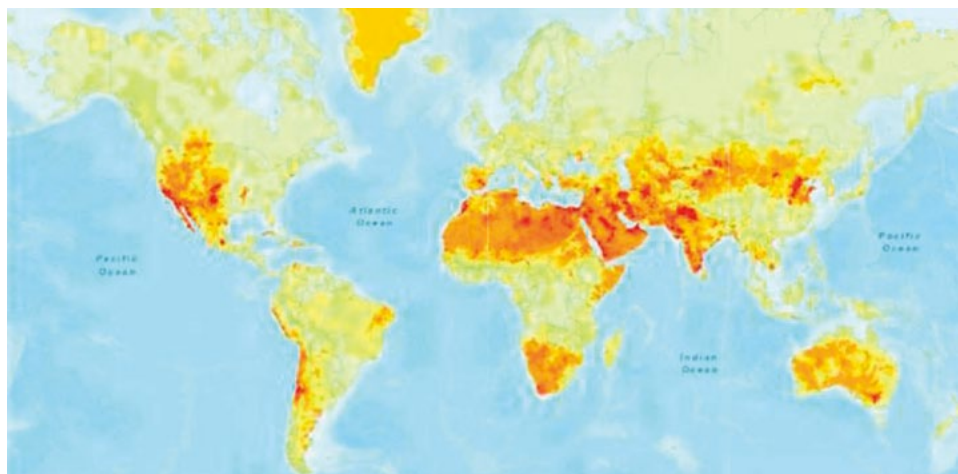
(4) MUFG AM Portfolio analysis

Geographic Information for Risk Analysis

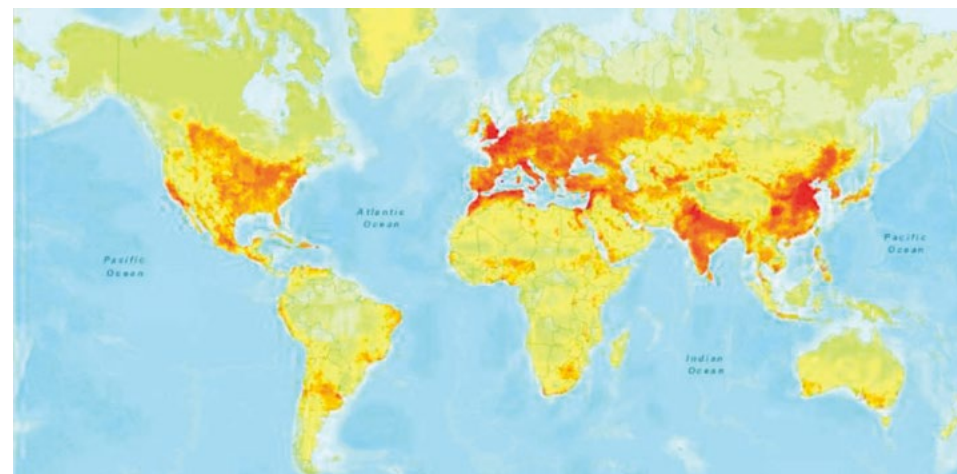
(i) Water: Analysis of sectors with a high degree of dependence on water supply and a high degree of impact on water quality



Water Availability



Water Quality



Sectors with a high degree of dependence on "water supply"

Utilities	Consumer Discretionary
Materials	Information Technology
Energy	Health Care
Real Estate	Communication Services
Consumer Staples	Financials
Industrials	

Sectors with a high degree of impact on "Emissions of toxic soil and water pollutants"

Utilities	Consumer Discretionary
Materials	Information Technology
Energy	Health Care
Real Estate	Communication Services
Consumer Staples	Financials
Industrials	

* Sectors are based on the Global Industry Classification Standard (GICS)

(Source) Prepared by MUFG AM based on "ENCORE (Exploring Natural Capital Opportunities, Risks, and Exposure)," a nature-related analysis tool.

The above charts show the analysis result of the Worldwide Fund for Nature (WWF) Risk Filter that visualizes the areas with high natural capital-related risks. Here, we provide examples of geographic information on risks deeply associated with "water." By integrating geographic risk information with the analysis results of dependencies and impacts related to natural capital

and biodiversity, and combining it with geographic data on investee companies' operational areas and supply chains, we can conduct scenario analysis and stress testing on specific aspects of natural capital, enabling more precise risk management.

(4) MUFG AM Portfolio analysis

Geographic Information for Risk Analysis

(ii) Soil and land: Analysis of sectors with a high degree of dependence on flood mitigation service/storm mitigation service and impact on area of land use



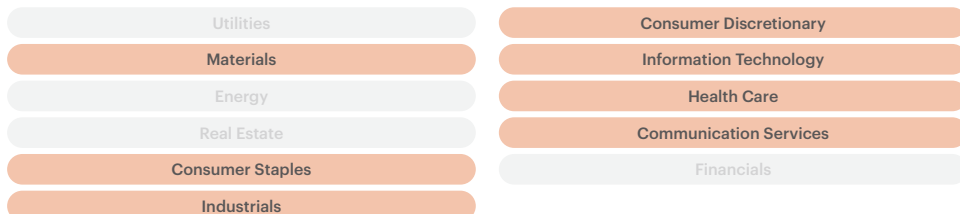
Tropical Cyclones



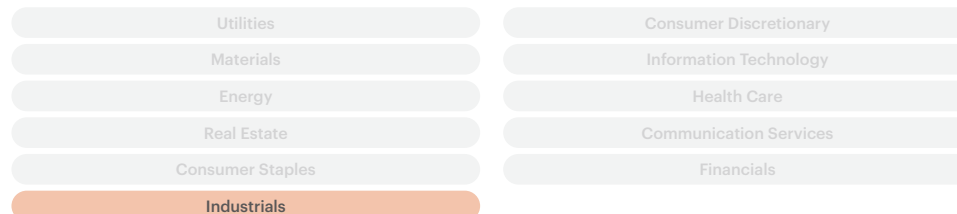
Land Slide Mitigation



Sectors with a high degree of dependence on “flood mitigation services and storm mitigation services”



Sectors with a high degree of impact on “Area of land use”



* Sectors are based on the Global Industry Classification Standard (GICS)

(Source) Prepared by MUFG AM based on “ENCORE (Exploring Natural Capital Opportunities, Risks, and Exposure),” a nature-related analysis tool.

Similarly to p.42, the above charts visualize and show geographic information of highly associated risks. Here, we provide examples of geographic information deeply associated with “air” and “land geomorphology” rather than “water.” MUFG AM not only conducts risk analysis of its portfolio on natural capital but also provides insights based on the relationship between nat-

ural capital and companies as well as encourages practical actions. By doing so, we believe that we can strengthen collaboration with companies and give a positive impact on natural capital and biodiversity simultaneously.



Engagement

- (1) Overall picture of engagement activities
- (2) Thematic engagement
- (3) Collaborative engagement
- (4) Public engagement

(1) Overall picture of engagement activities

Engagement by diversified approaches

➤ We choose high-priority themes for this fiscal year based on material ESG issues and the SASB framework. We have chosen “climate change,” “biodiversity,” “human rights” and “health and safety” as our high-priority themes for FY2024. According to these themes, we carry out engagement activities with diversified approaches, such as “thematic engagement,” “collaborative engagement” and “public engagement.”

Priority themes in FY2024



Thematic engagement

After determining high-priority themes, we carry out engagement strategically and intensely with the companies that are closely related with the said themes.

Collaborative engagement

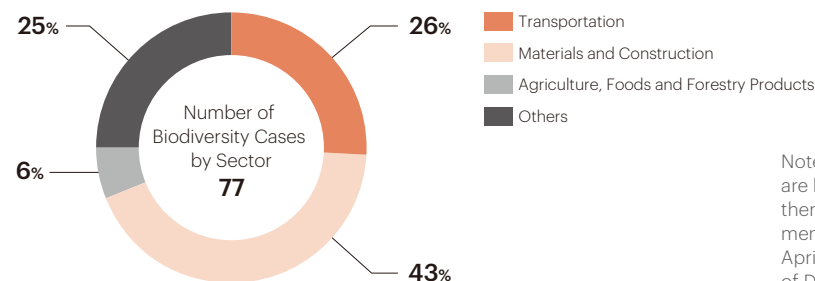
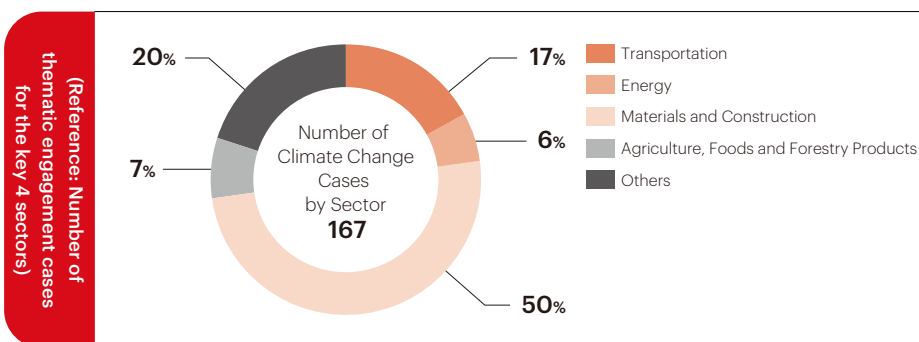
In order to carry out effective engagement, we plan to proactively participate in initiative activities and collaborate with related parties.

Public engagement

We make direct and indirect proposals to stakeholders in the financial market to resolve sustainability issues.

Achievement of FY2024

- Setting a detailed goal, we continued dialogues with having a common sense of purpose, depending on stage judgements and progress management in accordance with the status of corporate initiatives.
- We started to analyze life cycle assessment to improve effectiveness of engagement for mandatory disclosure of non-financial information in securities report.
- We implemented training programs with the support of external experts, hosting sessions in Europe to enhance advanced knowledge and build networks with European specialists.
- We approached companies from the perspectives of multiple investors to encourage companies to take measures as a lead investor of the Climate Action (CA) 100+.
- We held dialogues with washing machine makers and synthetic fiber apparel companies by using knowledge about microfiber that we gained in marine microfiber pollution.
- Our initiatives with IAST APAC were introduced by PRI Association's "Business and Human Rights" guide for institutional investors.
- In a round table with experts, we shared issues and detailed initiatives to promote transition financing.
- We released joint research papers to explain transition in Japan and the APAC region with the Asian Development Bank and the Asian Development Bank Institute.
- We provided insights and support for the Ministry of the Environment-led development of an evaluation method (creation of guidelines, etc.) for physical risks caused by climate change.



Note: The various graphs are based on MUFG AM's theme-specific engagement performance from April 1, 2024, to the end of December 2024.

(2) Thematic engagement

Engagement cases ①

Climate Change			
	Transportation sector: Automaker A	Transportation sector: Marine transportation B	Energy sector: Electric power C
	 Akira Tanaka	 Masaki Masuda	 Katsuyuki Nakai
Focus and aim of analysts 	Company A has taken steps to address regulatory requirements for mid- and large-sized commercial vehicles, which are among its non-core products targeted at the U.S. and European markets, by partnering with an external collaborator. However, the company has not disclosed specific mid- to long-term development and investment plans for its core small commercial vehicles and pickup trucks aimed at emerging markets, partly because regulatory compliance is not an immediate concern. We engaged with the company to assess potential transition risks and identify measures that may be necessary in the future.	Company B has goals to reduce GHG emission intensity in transportation by 45 percent by 2035 from 2019 for Scope 1+2 and achieve zero emissions (Scope 1+2+3, B and all subsidiaries) for the entire group by 2050, and we have confirmed Company B's current performance and future outlook. We requested engagement to discuss ① the status of dialogues and issues with ship owners to achieve GHG goals and ② thoughts on acquiring SBTi*1 and obstacles to acquire the SBTi.	Company C has been performing well and has strong financial investment capacity, as the company raised its mid-term plan's financial targets in April 2024. We believe the company has opportunities to further distinguish itself from competitors by leveraging its advantageous position within the industry to enhance its climate change initiatives. We have requested engagement to discuss its long-term energy transition strategies and explore potential areas for further acceleration.
Reaction from companies that we held dialogues with 	In the case of Company A, which mainly sells vehicles in emerging countries, it is estimated that about 40,000 to 50,000 units of zero-emission vehicles will be required per year to comply with regulations as of 2030. With this, we have confirmed that investment risks during the current mid-term business plan are limited. Regarding the tightening of regulations that target NOx and tire dust in Europe (EURO 7), there are no clear prescriptions. We agreed on the recognition that it is appropriate to assess the situation for the moment, since some twists and turns are expected before it is codified.	Company B promotes the introduction of LNG dual-fuel vessels*2 and ships equipped with wind challengers*3 in the short-term, while it aims to develop ammonia-fueled ships by 2030 as a long-term solution. The company achieved its goal almost a year ahead of schedule, due to the acceleration of introducing energy-saving devices and implementing slow-speed sailing. There is no progress in talks about the introduction of next-generation vessels with ship owners, because Company B hasn't decided its policy. We have confirmed Company B recognizes that it is hard for international shipping companies to acquire SBTi.	The company raised its GHG emissions goal for FY 2025 and FY 2030 in April 2024. Company C also plans to increase its contribution to reducing emissions for the entire society through providing products and services. The company is in line with its goal of developing a total of 9 million kW in renewable energy by 2040. Company C sees that major competitors' plan to have a development capacity of 20 million kW by 2035 is quite ambitious. Taking into account the country's energy policy, Company C plans to enhance details of its growth strategy.
Future engagement objectives 	Of the CO ₂ emissions from Company A's entire value chain, emissions from the process of product usage account for 90 percent. This time, we have discussed reducing the environmental impact of hardware, but we plan to shift our discussion in the future to software measures such as improving logistics efficiency by using connected technology. Company A plays a role to promote "high added value and improving efficiency in logistics, commercial use and transportation" in the Japan Automobile Manufacturers Association, and we seek to see Company A show leadership in building an industry-wide system.	In the shipping industry, which is one of "hard-to-abate" (industries that are hard to reduce CO ₂ emissions with existing technologies) sectors, it is said that new fuels such as ammonia and hydrogen will not become widely available until around 2030, and it is unclear which of these will become mainstream. We will continue to follow up on implementation status of climate change countermeasures that are especially required for urgent action. We also plan to follow up on the dialogue status with ship owners and measures toward acquiring SBTi.	Based on the direction of the country's energy basic plan scheduled for FY 2024, we asked the company to make progress in sophisticated its roadmap for emission reduction in the future. We will also continue to discuss whether there is room to further speed up the company's growth strategy for renewable energy through development investments and expansion in partnerships. In addition, we also seek to ask Company C to further expand the information disclosure associated with policy advocacy activities including industry activities.

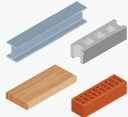
*1 The Science Based Targets Initiative (SBTi) is an initiative that supports companies and financial institutions in setting ambitious emission reduction targets in line with the latest climate science. It aims to accelerate corporate climate change measures with the aim of halving GHG emissions by 2030 and achieving net zero by 2050.

*2 Dual-fuel ships that can use liquefied natural gas (LNG) as well as heavy fuel oil. LNG emits less GHG than heavy fuel oil, so it can reduce environmental impact.

*3 Ships equipped with a device that converts wind energy into propulsion power using a retractable sail (rigid wing sail). This enables a reduction in the amount of fuel used for navigation, and expected to reduce environmental impact and improve economic efficiency.

(2) Thematic engagement

Engagement cases ②

Climate Change		
		
		
	Materials and construction sector: Nonferrous metal maker D	Materials and construction sector: Electric appliance maker E
		
	Agriculture, foods, forestry products sector: Food maker F	
Focus and aim of analysts 	Against a backdrop of structural headwinds such as tight supply and demand for copper concentrate, declining grades, and worsening terms for purchasing ore, Company D recognized that reengineering its metals business with a focus on resource recycling would be a medium- to long-term issue. Company D effectively withdrew its policy of increasing capacity in its traditional smelting business, so concerns about investment returns have diminished, but the establishment of recycling technology that does not rely on expanding existing processes has emerged as an important theme. We conducted engagement to discuss a strategy for expanding a resource recycling business with a high degree of feasibility.	We held engagement meeting with Company E and discussed lobbying activities. Since Company E lacked the recognition of an importance of information disclosure about lobbying activities, we proposed the company have a meeting with a U.K.-based think tank that promotes climate change response. As Company E asked, we requested engagement with the participation of the think tank.
Reaction from companies that we held dialogues with 	Company D is currently conducting a feasibility study on smelting process technology that specializes in recycled materials in the United States, but it has indicated that it will be difficult to commercialize the technology in the near future due to the high initial investment burden, including the cost of building the plant. On the other hand, in Europe, we confirmed that efforts to develop the infrastructure for closed-loop recycling, such as the establishment of a company to oversee resource recycling businesses and the consideration of building new smelting bases, are progressing.	Company E did some activities associated with climate change including an exhibition at the COP 28 and negotiations with the Ministry of Economy, Trade and Industry. Company E, however, had not disclosed them proactively. Following meetings with us, the company shared the view that it was necessary to disclose information proactively in addition to lobbying activities. We confirmed the company's intention to listen to opinions from experts and disclose the information expected by institutional investors in the future.
Future engagement objectives 	We consider that the company's latest management policies, such as revising policy to increase domestic capacity and shifting to Europe to procure recycled raw materials, are desirable in building a stable resource recycling business based on local production and local consumption. We plan to exchange opinions about room for expansion in regions other than Europe, such as potential business opportunities in the U.S. where the recovery rate of recycled raw materials is low.	Company E plans to consider expanding its lobbying activities to a "surface" approach from a "point" approach. We increased our awareness of Company E's necessity to proactively disclose information on climate change initiatives (lobbying activities) as one of the important activities to support the company's strategy. We plan to support Company E's proactive disclosure structure including lobbying activities.

(2) Thematic engagement

Engagement cases ③



(3) Collaborative engagement

Cases of collaborative engagement



Climate change



Climate Action 100+ (CA100+) is an investor-led initiative in which global investors collaborate to engage with 170 companies that are among the world's largest GHG emitters, including 11 Japanese companies. There are three purposes: ① To strengthen climate change governance (board-level supervision), ② To reduce total GHG emissions and ③ To strengthen corporate disclosure related to climate change. As of Sept. 30, 2024, more than 600 global investors participated in the initiative.

The CA100+ evaluates the transition status

of net-zero emissions with its own unique analysis method based on companies' public information and disclosed data. In the evaluation result announced in October 2023, it suggested the pace of reduction in GHG emissions at most of the CA100+ target companies was not sufficient (it was not sufficient to lower investor risks in line with the goal of the Paris Agreement). The CA100+ positions the period until 2030 as the most important period for climate change countermeasures.

Initiative status

Dialogues

MUFG AM, which repeated dialogues with the Japan Electrical Manufacturers' Association (JEMA), shared investors' attitudes and actual status regarding climate change and the views on information disclosure that investors expect.

Response from companies

The Japan Electrical Manufacturers' Association (JEMA) released the "JEMA-GX Report 2023" that reviewed its environmental measures in the electric industry and progress for initiatives especially toward decarbonization.

Result and issues

Following the release of the "JEMA-GM Report 2023," a U.K.-based think tank evaluated its content and upgraded JEMA's rating from "C-" to "C." MUFG AM facilitated opportunities for dialogue between JEMA and the think tank, playing a role in improving JEMA's rating. Moving forward, we aim to emphasize the significance of achieving net-zero targets, engage more companies and industry groups, and support efforts to advance these initiatives while enhancing transparency through expanded information disclosure.



Biodiversity

Marine Microfibre Pollution

Marine Microfibre Pollution is a global collaborative engagement program led by First Sentier Investors, an asset management subsidiary of Mitsubishi UFJ Trust and Banking Corporation under MUFG AM. In order to prevent marine pollution, First Sentier Investors is asking washing machine manufacturers to add filters that catch microfiber during the washing process of synthetic fiber clothing, etc. as standard equipment in their washing

machines, as microfiber falls off mainly when washing synthetic fiber clothes.

MUFG AM Su is implementing engagement with major Japanese washing machine makers as well as upstream apparel makers.

It also cooperates with Japan's relevant authorities, since there are moves to regulate and legislate microfiber by authorities in the U.S. and Europe.

Initiative status

Dialogues

We had a follow-up meeting with Company P, one of our ongoing engagement partners, to discuss the project's progress. We also briefed the Ministry of the Environment on global initiatives and the perspectives of authorities in other countries, with input from a leading expert from the U.K. whom we invited to Japan.

Response from companies

Even as discussions are underway to develop global measurement standards through JEMA, the progress may take a long time. The Ministry of the Environment expressed its gratitude for our continued provision of information.

Result and issues

Japanese companies have been slow to act, partly because they do not sell washing machines overseas, especially in Europe, where regulations are becoming increasingly strict. We will keep encouraging them to take proactive measures ahead of these regulatory changes.

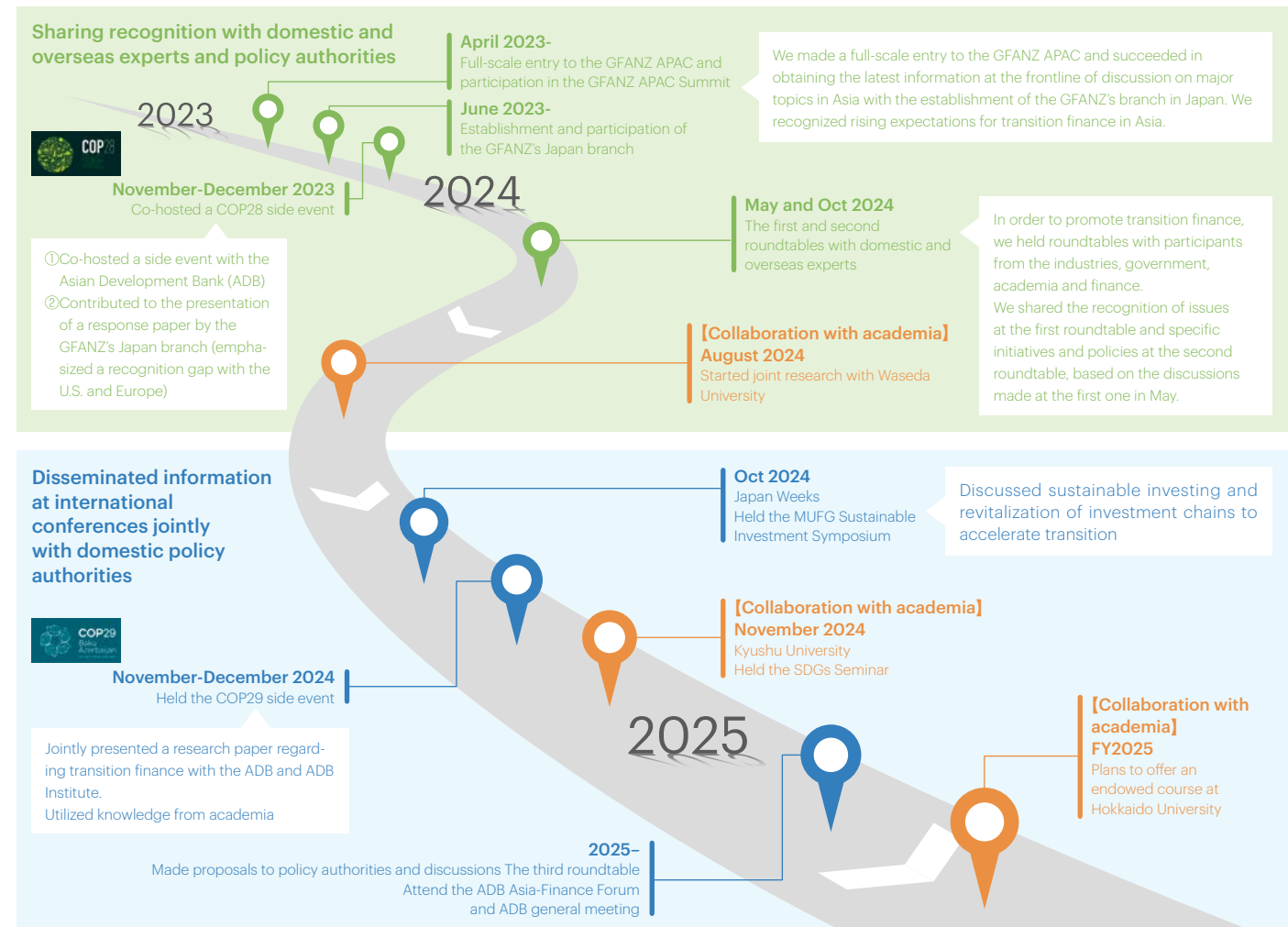
(4) Public engagement

Introduction of public engagement cases

Mitsubishi UFJ Trust and Banking, part of MUFG AM is participating in international initiatives including the GFANZ and works together with domestic and overseas financial institutions and academia.

In order to achieve a sustainable society, we disseminate issues surrounding the industries and solutions we have obtained through joint research with financial institutions and academia at international conferences and UN conferences. We believe proactively sharing issues and resolutions and approaching domestic and overseas authorities will lead to achieving a sustainable society more smoothly and contributing to sustainable growth of investee companies.

As an example, we'd like to introduce our public engagement regarding climate change problems (mainly transition) so far.

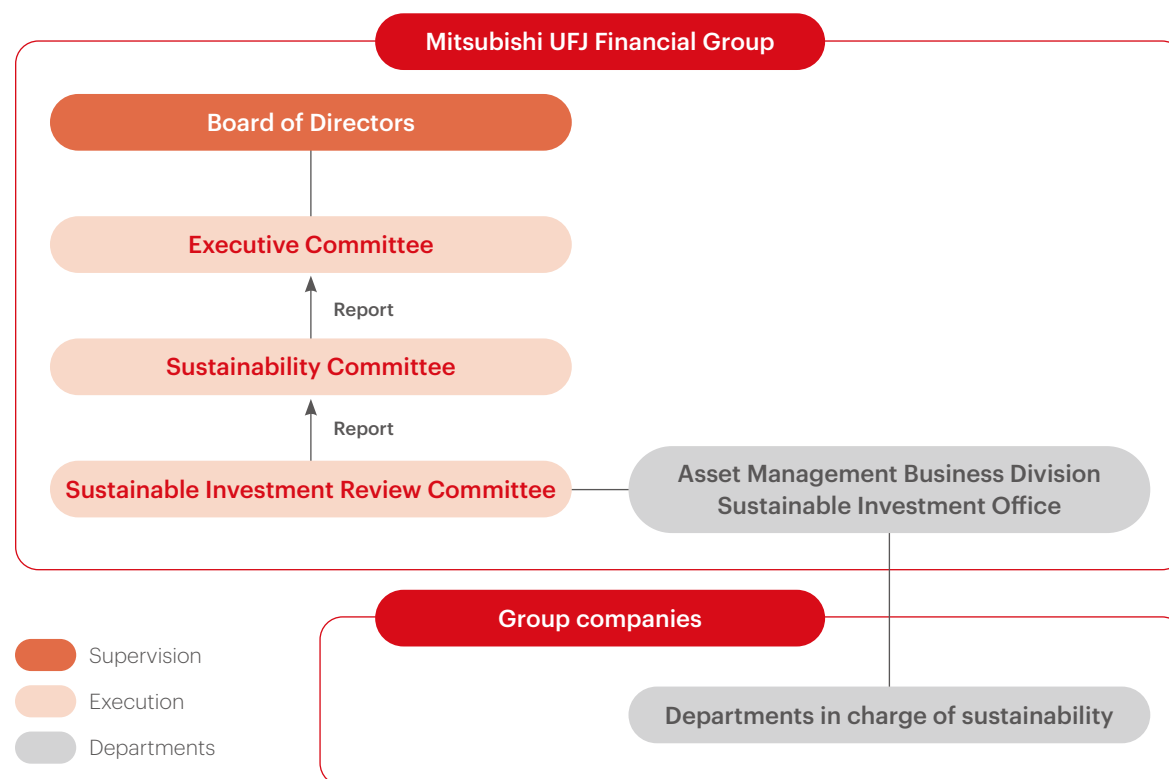




Governance and Risk Management

Governance and Risk Management

Oversight and Enforcement Structure for climate and natural capital-related risks



Sustainability Committee	
Chairperson	Group CSuO (Chief Sustainability Officer)
Members	Group CEO, CSO, CFO, CRO, Department Head Directors in charge at each Group company, etc.
Mission	Discuss initiatives aimed at resolving environmental and social issues in order to contribute to environmental and social sustainability and secure sustainable growth for MUFG

Sustainable Investment Review Committee	
Chairperson	Managing Executive Officer, Deputy Chief Executive, Asset Management & Investor Services Business Uni, Business Head, Asset Management Business*
Members	Business Head of Asset Management & Investor Services Business Head of Sustainable Investment Stakeholders from MUFG Group asset management companies and related parties
Mission	Review and deliberate on key matters concerning sustainable investment in the asset management business

* Executive in charge of the asset management business

MUFG AM discusses climate change- and natural capital-related sustainable investment policy, strategy and structure at its Sustainable Investment Review Committee. The content is reported to the Sustainability Committee under the Executive Committee. The Sustainability Committee reports to the Executive Committee and also reports to the Board of Directors, as necessary.

In addition, we also have the system to regularly conduct risk analysis (analysis of transition and physical risks regarding climate change and analysis of dependence and impacts on natural capital and ecosystem services) and report to the Sustainable Investment Review Committee as necessary.



Appendix

(1) Appendix. 1**Correspondence table for disclosure items in the report and TCFD/TNFD disclosure requirements**

The Task Force on Climate-Related Financial Disclosures (TCFD) and Task Force on Nature-related Financial Disclosures (TNFD) require information disclosure based on four pillars, “Governance”, “Strategy”, “Risk management”, “Metrics and Targets”. In the report, MUFG AM discloses the results of the analyses and initiatives related to climate change and natural capital. The above chart illustrates how each disclosure item in the report aligns with the disclosure requirements of both task forces and demonstrates that the content fulfills all four pillars.

We have particularly expanded the “strategy” part, because we recognize the importance of how we respond to these issues strategically, after conducting a detailed analysis of MUFG AM’s portfolio and accurately understanding multifaceted information, including risks and opportunities related to climate change and natural capital. We also explain in the report that we have built an established governance and risk management system as a foundation to support realization of our strategy.

MUFG AM aims to further enrich the content of the report in the future, fostering trust with investors and stakeholders by ensuring transparent information disclosure.

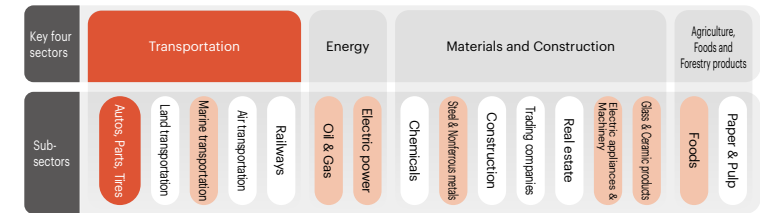
Classification			TCFD/TNFD			
Primary items	Secondary items	Applicable page	Governance	Strategy	Risk Management	Metrics and Targets
Climate Change	MUFG AM portfolio analysis	7-19		○		○
	Approach to realization of transition plan	21		○		○
	Analysis of key 4 sectors by our analysts	22-25		○		
	LCA analysis and engagement plans	26		○		
Natural Capital and Biodiversity	Integrating climate and nature	28-31		○		
	Roles fulfilled by financial institutions	32-34		○		
	MUFG AM’s future initiatives	35		○		
	MUFG AM Portfolio analysis	37-43		○		○
Engagement	Overview of engagement	45		○		
	Thematic engagement	46-48		○		
	Collaborative engagement	49		○		
	Public engagement	50		○		
Governance and risk management	-	52	○		○	

(2) Appendix. 2

Analysis of sub-sectors belonging to key 4 sectors

Transportation sector:

Automobile, Automotive parts, Tires



Risks and opportunities	Examples of risks and opportunities	Short- to mid-term	Long-term	Financial impact
Risks hindering the improvement of corporate value	Turning equipment, intellectual property and human resources, which are related to internal combustion engines (ICE), into stranded assets	○		Big
	Delayed construction of electrified supply chain in batteries, etc.	○	○	Big
	Increased costs due to regulatory compliance and green procurement		○	Big
	Intensifying price competition and rising share of emerging OEMs in the electric vehicle market	○		
	Falling recoverability of upfront investment, due to wrong technology selection	○		
	Incurring penalties and restrictions on sales opportunities, due to non-compliance with environmental regulations	○		
	Conflict with public opinion and alienation of customers and investors, due to insufficient decarbonization measures	○	○	
	Tighter regulations and restrictions on tires for the purpose of preventing deforestation and reducing wear dust		○	
Opportunities contributing to improvement of corporate value	Market expansion in electrification-related products and advanced safety equipment	○	○	Big
	Expansion in differentiated product areas centered on environmental performance (fuel-efficient tires)	○		Big
	Expansion in connections with customers through connected services and software updates and winning profit sources without relying on new car sales	○	○	Big
	Stimulating buying interest by providing new UX such as enhancement of autonomous driving functions		○	
	Value creation leading to resolving social issues such as mobility services and the electric vehicle (EV) grid (integration of EV into the power grid)		○	

Point of analytical view on sustainability issues

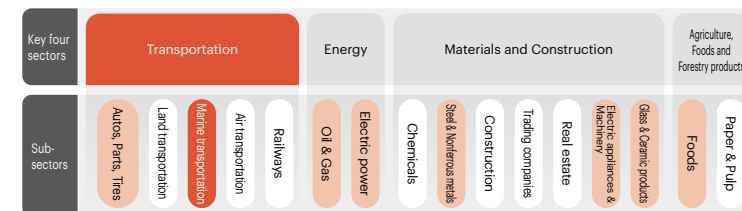
- Environmental regulations including climate change will drive a game change in the auto business through innovations of core technologies and supply chains. Cost parity between ICE and EV will remain difficult for the meantime and the profitability of a new car will shrink as the proportion of EV rises.
- Future demand forecasts and the regulatory trend are highly uncertain, and the auto industry faces high management risks during the transition phase. Short- and mid-term issues are to improve core profitability to prepare for an increasingly difficult business environment and diversify investment risks by external collaboration.
- Even if the transition to EV succeeds, a growth scenario depending on mass production and sales of new cars will reach a limit in the long term. The mid- and long-term issues will be to shift the focus to service revenue gained throughout the life cycle based on the number of cars owned.
- Suppliers are bipolarized into business areas that can be expected to expand the market and improve added value based on the theme of climate change, and those do not. For traditional auto parts makers, it will be a challenge to expand the size of production through business selection and industry reshuffle with consideration to supply responsibilities.
- It also needs to create a system to visualize CO₂ emissions in the multi-layered supply chain and properly share the cost of reduction measures. Besides responding to climate change, growth in the tire industry will be decided by the success or failure of nature-related risk management including land use.

(2) Appendix. 2

Analysis of sub-sectors belonging to key 4 sectors

Transportation sector: Marine transportation

Risks and opportunities	Examples of risks and opportunities	Short- to mid-term	Long-term	Financial impact
Risks hindering the improvement of corporate value	Increased costs due to tighter environmental regulations including carbon tax and emissions trading	○		
	Existing-fuel ships and LNG-fueled ships may pose a risk of being stranded assets, due to a delay in decarbonizing the fleet and early dissemination of zero-emission vessels.		○	
	Formulation of capital investment plans in line with a change in the trend among customers such as rising demand for low-carbon and carbon-free marine transportation services		○	
	Technology developments of low-carbon and carbon-free energies including recovery and reuse of hydrogen, ammonia and CO ₂		○	Big
	Negative impact on business due to intensification of natural disasters such as typhoons and cyclones (a drop in transportation volume and increasing operating days and costs due to avoiding typhoons)	○		
	Risks that real estate and port facilities such as warehouses and terminals located in low-lying areas may be unusable, due to sea level rise	○		
Opportunities contributing to improvement of corporate value	Increased demand for marine transportation such as decarbonization-related cargo including ammonia and hydrogen		○	
	Introduction of alternative-fuel ships due to rising demand from shippers who request to lower carbon in their supply chains	○		
	Reduction of CO ₂ emissions by introducing more efficient navigation technology and energy-saving equipment.	○		



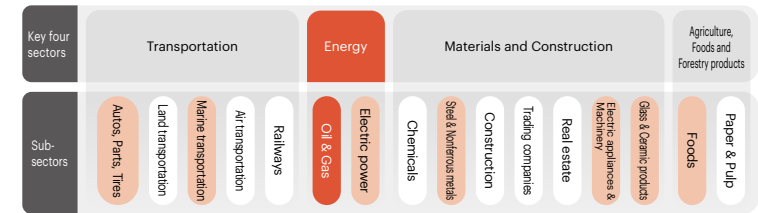
Point of analytical view on sustainability issues

- The shipping industry is making progress in reducing GHG emissions by steady implementation of measures such as the introduction of energy-saving devices and the expanded use of slow sailing to improve efficiency of ship operations. The fleet formation that takes into account future changes in cargo movements and transportation demand is a key to reducing CO₂ emissions and increasing profits.
- In the environment where GHG emissions are increasing due to a change in sailing routes to cruise via the Cape of Good Hope against a backdrop of heightened geopolitical risk in the Middle East, we pay attention to measures to meet the reduction targets required by the international shipping industry.
- The work to install hull appendages (devices that attach objects to the hull below the water's surface to recover lost energy) is underway, and it is expected to increase the improvement effect on the environment in later years, as ships with the device will start to operate sequentially.
- The key to realization of net zero is fuel conversion, and steady reductions in GHG emissions will likely continue as a result of accelerated low-carbon and decarbonization efforts by introducing LNG-fueled ships until around 2030 and zero-emission ships including new ammonia- and hydrogen-fueled ships thereafter.
- The key is to request support from the government and other relevant parties for supply, production and use of hydrogen, ammonia and biofuels in cooperation with the shipping industry and energy industry.
- The first priority is to lower Scope 1 and 2 emissions, which shipping companies can control on their own. However, since the net zero plan includes Scope 3, we plan to follow up on the status of dialogues including data collection involving business partners and switching to low- and zero-emission vessels.

(2) Appendix. 2

Analysis of sub-sectors belonging to key 4 sectors

Energy sector: Oil and Gas



Risks and opportunities	Examples of risks and opportunities	Short- to mid-term	Long-term	Financial impact
Risks hindering the improvement of corporate value	Risk of higher financial burden on companies to realize decarbonization due to tighter environmental regulations such as carbon tax.	○	○	Big
	Negative impact on business, due to intensification of natural disasters (unstable facility operations and increased costs for countermeasures)	○	○	
	Risk of worsening reputation from customers and the market due to a delay in taking decarbonization measures	○	○	
	In the long term, it is inevitable to make a major shift from the business structure centered on fossil fuels.		○	Big
Opportunities contributing to improvement of corporate value	Increased demand for natural gas as transitional energy in the meantime	○		Big
	Increased demand for renewable energy, hydrogen and other carbon-neutral energies		○	Big
	Expansion in business opportunities due to the progress in clean technology such as carbon capture and storage (CCS).		○	
	Curbing climate risks by supporting companies' decarbonization efforts may stabilize long-term investment returns.		○	

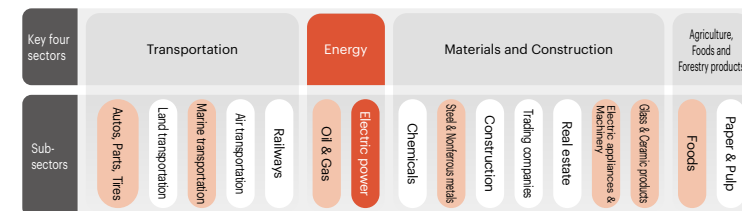
Point of analytical view on sustainability issues

- The industry that is sometimes faced with the difficult challenge of simultaneously addressing conflicting demands: Environment factor (realizing a decarbonized society) and Social factor (energy security).
- It is important for major domestic wholesalers to improve the operating rate and operational efficiency of existing refineries to increase their investment capacity in growth areas such as sustainable aviation fuel (SAF) and hydrogen.
- The government's policy that places LNG as an important transitional energy is positive for the gas industry. However, further efforts are needed in the future to decarbonize gases such as E-methane.
- Since the industry mainly uses fossil fuels, management risk due to a change in business structure is higher than in the electric power industry.

(2) Appendix. 2

Analysis of sub-sectors belonging to key 4 sectors

Energy sector: Electric power



Risks and opportunities	Examples of risks and opportunities	Short- to mid-term	Long-term	Financial impact
Risks hindering the improvement of corporate value	Increased costs for fossil fuel power generation and higher stranded asset risk, due to tougher environmental regulations	○	○	Big
	Risk of worsening reputation from customers and the market, due to a lack of progress in decarbonization	○	○	
	Risk that it may be difficult to recover an enormous amount of decarbonization-related investments due to a change in policy and intensifying competition	○	○	
	Escalating risks of equipment damage and increasing countermeasure costs due to the intensification of natural disasters	○	○	
	A drop in demand for grid power due to expansion in introduction of diversified power sources		○	Big
Opportunities contributing to improvement of corporate value	Expansion of business opportunities driven by Japan's GX policy promotion, such as the growth of renewable energy	○	○	Big
	Increased demand for electric power due to expansion in electrification (due to a shift from fossil fuels)	○	○	
	Trust from policy authorities and local societies through decarbonization and stable supply may strengthen long-term business foundation.		○	Big
	Curbing climate risks by supporting companies' decarbonization efforts may stabilize long-term investment returns.		○	

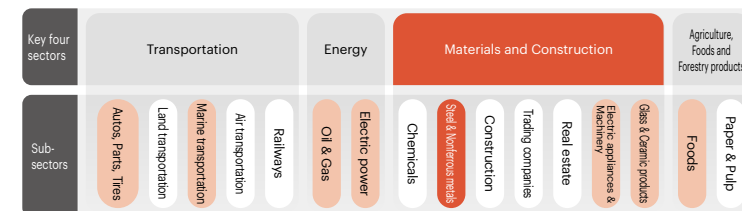
Point of analytical view on sustainability issues

- The industry that is sometimes faced with the difficult challenge of simultaneously addressing conflicting demands: Environment factor (realizing a decarbonized society) and Social factor (energy security).
- GHG reduction is getting difficult, because demand for electric power is increasing due to data centers and semiconductor factories.
- Efforts to restart nuclear power plants are expected to progress cautiously, including discussions with local communities.
- On the other hand, it is challenging to predict business profitability for investments in new areas such as renewable energy and carbon capture and storage (CCS) without certain level of government subsidies.
- Aligning company strategies with Japan's GX policy is crucial for the sustainable growth of corporate value.

(2) Appendix. 2

Analysis of sub-sectors belonging to key 4 sectors

Materials and Construction sector: Steel & Nonferrous metals



Risks and opportunities	Examples of risks and opportunities	Short-to mid-term	Long-term	Financial impact
Risks hindering the improvement of corporate value	Increased capital investment and development burden for implementation of new manufacturing methods for low carbonization and energy conversion	○	○	Big
	Lower productivity and higher operating costs due to the shift to a manufacturing process with smaller heat sizes than the blast furnace method		○	Big
	Increased costs to procure raw materials, due to stalled mine development caused by environmental conservation pressure and oligopoly of mining operators	○	○	
	Stagnant market formation for green products, a delay in social sharing of costs for environmental measures and shrinking marginal profit per ton		○	Big
	Energy usage intensity remains high due to a drop in concentrate grade and an increase in impurities (nonferrous metals)	○	○	
	Market fragmentation of base material trading, because of a closed-loop of supply in consumption regions		○	Big
	Failure to achieve a development target for super-innovative technology centered on hydrogen reduction blast furnaces		○	Big
	A delay in an infrastructure development plan for hydrogen supply		○	Big
Opportunities contributing to improvement of corporate value	Increased demand for differentiated products and technologies, which is boosted by social demands regarding the environment		○	
	In steel, expansion in sales of electrical steel sheets, high-tensile steel materials, stainless steel pipes for high-pressure hydrogen, direct reduced iron (DRI) manufacturing process		○	Big
	In nonferrous metals, Increased demand for copper, nickel and other materials that benefit from electrification of cars and dissemination of renewable energy		○	Big
	Monetization by externally providing solutions for effective energy utilization, which Japanese companies have strengths	○		
	Strengthening resilience against demand changes by a shift to electric furnaces that are relatively easy to adjust operations		○	

Point of analytical view on sustainability issues

- In Japan, six of the 26 blast furnaces have been suspended since 2016, and CO₂ emissions by three blast furnace companies declined 24 percent, compared to FY 2013. Taking into account future plans for additional facility suspensions, achieving the 2030 goal (a drop of 30 percent, compared to FY13) is within reach.
- However, emission reductions to date have been mainly by cutting crude steel production, and improving emission intensity by ton is an issue for the future. Of the existing blast furnaces in Japan, 11 (equivalent to 60 percent of facility capacity) are old facilities that were renovated before 2010 (two of them are scheduled to be suspended). It is expected that Japanese mills will begin to implement low-carbon technology* in earnest from the 2030s, when these facilities will enter a phase of large-scale renewal.
- As a temporary measure, progress is expected to be made in partial replacement of coke with hydrogen or methane and expansion in the adoption range of direct reduced iron (DRI) and electric furnaces. Cash-out of carbon neutral-related investments will start in earnest in the 2030s, and the triple burden of increasing capital expenditure (CAPEX), operational expenditure (OPEX) and research and development (R&D) will continue for a long time. We plan to hold dialogues focusing on issues related to the predictability of investment recovery, including a review of domestically produced steel types, selective investments and social sharing of costs.
- Short-term issues for nonferrous metals are implementing measures that can be taken with existing technologies including fuel conversion, renewable energy generation and the use of green electricity. From the LCA perspective, mining, beneficiation and transportation processes at mines account for three-quarters of electrolytic copper's life cycle CO₂ emissions.
- Long-term issues will be to review the ore purchase-centered smelting business, commercialize recycling-specific smelting technology and expand the downstream sector.

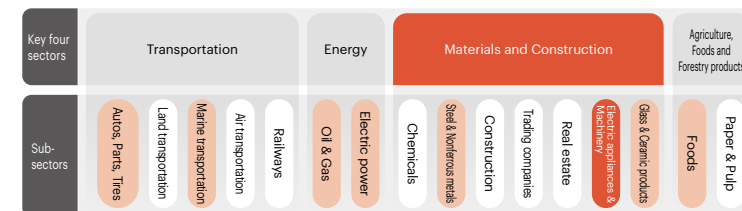
*Low-carbon technologies that combine measures such as raw material conversion (utilization of direct reduced iron), reductant conversion (utilization of hydrogen), and process conversion (utilization of large electric arc furnaces)

(2) Appendix. 2

Analysis of sub-sectors belonging to key 4 sectors

Materials and Construction sector: Electric appliance and Machinery

Risks and opportunities	Examples of risks and opportunities	Short- to mid-term	Long-term	Financial impact
Risks hindering the improvement of corporate value	Falling demand in products due to tougher regulations and policy changes by various countries	○		Big
	Delayed response to new environmental technologies	○	○	Big
	Delayed response to new technologies and power-saving measures for data centers		○	Big
	Sluggish demand for EVs and rapid changes in supply and demand	○		
	Delayed response to renewable energy	○		
	Increased costs due to electric power supply shortages and sluggish product sales	○	○	
	Increased materials and transportation costs	○	○	
	Failure to respond to intensification of abnormal weather and decreased product demand		○	
	Increased costs for substitutes due to stronger demand for reduced use of plastics in packaging		○	
	Lower corporate value due to changes in investor and customer attitudes toward the environment		○	
Opportunities contributing to improvement of corporate value	New technologies, power-saving electronic components and machinery and services for data centers	○	○	Big
	Increased demand for decarbonization-ready auto-parts, manufacturing machinery and services	○		Big
	Increased opportunities for advanced companies due to tighter regulations on refrigerants, energy conservation and fossil fuels	○	○	Big
	Increased opportunities to provide parts, related machinery and solution services due to increased demand for renewable energy		○	Big
	Contributing to reductions of CO ₂ emissions of other companies through providing environmentally friendly parts, manufacturing machinery and services.		○	



Point of analytical view on sustainability issues

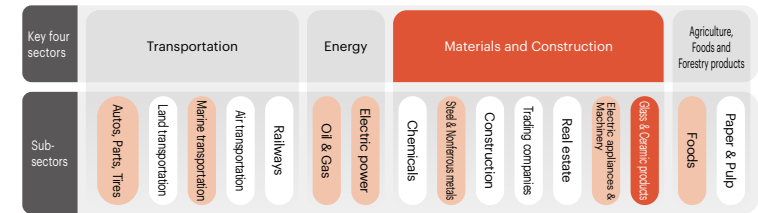
- Conversion to renewable energy from fossil fuels for environmental considerations is accompanied with rising demand for electronic parts and manufacturing machinery. It is essential for more efficient, energy-saving equipment to have cutting-edge parts and services.
- There is constant need for technological innovation to meet demand for new technology for environmental consideration.
- Response to rising costs for materials, R&D and labor to meet regulations.
- Response to an increase in cheaper competing products from Asia
- Increased demand for parts is not just about raising quantity but also improving quality, which requires constant technological innovation.
- How to assess contributions to reductions of CO₂ emissions of other companies by providing parts, machinery and services with environmental considerations.

(2) Appendix. 2

Analysis of sub-sectors belonging to key 4 sectors

Materials, Construction sector:

Glass and Ceramic products



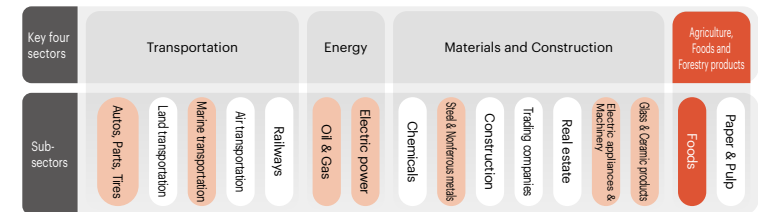
Risks and opportunities	Examples of risks and opportunities	Short- to mid-term	Long-term	Financial impact
Risks hindering the improvement of corporate value	Rising costs due to introduction of carbon pricing and tightening of CO ₂ emission regulations	○		Big
	Rising raw material prices due to a change in resource supply-demand structure	○		
	Rising costs to respond to an increase in capital investment for production facilities due to strengthening of CO ₂ emission reductions	○		
	Negative impact on workforce due to rising average temperature and chronic occurrence of abnormal weather conditions	○	○	Big
	Negative impact on operations and logistics due to frequent and severe natural disasters	○	○	Big
Opportunities contributing to improvement of corporate value	Increased demand for environmentally friendly construction materials	○	○	Big
	Increased demand for renewable energy-related products such as storage batteries and glass fiber for wind power generation	○		Big
	Market expansion due to dissemination of Carbon dioxide Capture and Storage (CCS) / Carbon dioxide Capture and Utilization (CCU)	○	○	Big
	Deepening of technologies for advanced resource recycling economy such as CO ₂ recovery and utilization technologies		○	Big
	Improved stakeholder evaluation by contribution to carbon neutrality	○	○	

Point of analytical view on sustainability issues

- CO₂ emission reduction is greatly different between glass etc. and cement. In the former, energy saving and energy creation (creating renewable energy) are the key, while in the latter, besides those, process-derived CO₂ recovery and utilization are important.
- We focus on how glass makers will effectively make progress in saving energy use by recovering waste heat and converting energy to biomass and hydrogen from coal, oil and natural gas, while shrinking their financial impact. This also includes carrying out detailed transition plans such as converting to electric arc furnaces with focus on regional power factor disparities and the development of technologies to reduce process-derived CO₂ emissions, such as glass cullet recovery and CO₂ absorption ceramics development.
- Besides energy-derived CO₂ emission reductions stated above, which make up 40 percent of CO₂ emissions in the cement production process cement companies need to lower CO₂ emissions derived from process (raw materials), which account for the remaining 60 percent. We focus on a schedule for technology development and implementation of CO₂ recovery and reuse (CCS/CCU, methanation, carbonate mineralization and artificial photosynthetic hydrogen production), as well as advocacy activities to encourage demand sides' desire to introduce them.

(2) Appendix. 2

Analysis of sub-sectors belonging to key 4 sectors Agriculture, Foods and Forestry products: Foods



Risks and opportunities	Examples of risks and opportunities	Short- to mid-term	Long-term	Financial impact
Risks hindering the improvement of corporate value	Increased fossil fuel-derived energy costs due to climate change mitigation policy (introduction of carbon tax)	○	○	Big
	Increased regulations and additional capital investment for facilities that emit CO ₂ , due to the introduction of carbon tax	○	○	Big
	Increased costs due to rising prices because of expanded introduction of renewable energy	○	○	Big
	Taxation on fossil fuel materials	○	○	Big
	Financial impact on agriculture procurement due to carbon pricing	○	○	Big
	Incompatibility with rapid agricultural policy transition (many cases in emerging countries)		○	
	Increased procurement costs for recycling materials	○	○	
	Decreased crop yields and livestock production (higher costs) due to continued rise in average temperature)	○	○	
	Strained water supply at production sites due to frequent floods and droughts	○	○	Big
	Reputational risk associated with environmental pollution caused by the improper disposal of used containers		○	
	Liabilities for damage to the natural environment (compensation, fines, administrative penalties, loss of public trust)		○	
Opportunities contributing to improvement of corporate value	Increased consumer demand for ethical products		○	
	Increased demand for processed and frozen food due to rising needs for simplified cooking because of rising temperatures	○	○	Big
	(Applicable to some companies) Increased contribution in the health science area (e.g., supplements and functional foods)		○	
	Winning consumer support by development of upcycled products		○	
	Joint container development with other industries and competitors (expansion of global business)		○	
	Increased needs for beverages due to rising temperatures	○	○	Big
	Increased demand for nutritionally balanced foods and foods that efficiently provide nutrition (contributing to preventing the worsening of nutritional deficiencies in developing countries)	○	○	Big

Point of analytical view on sustainability issues

- When we conduct a risk analysis and view the result from a broader perspective, all of these risks converge on the risk of rising costs. In some cases, there are concerns about competition for raw materials themselves.
- Based on this assumption, companies that have the ability to raise prices due to its position (high market share) in the industry and brand value, we can expect further business expansion (expansion in market share) and higher margins.
- The key to growth for food companies is to create brand value that allows them to raise prices, while building the trust of stakeholders in supply chains through sustainability activities and paying attention to dialogues with consumers.

Important notice

- The contents of this document were prepared for the purpose of providing general information to the customer. It is not a solicitation or an offer to buy or sell any securities or financial products.
- The observations and opinions expressed in this report represent the personal views of the analysts and do not necessarily reflect the MUFG AM's official views.
- Any views expressed in this document are assumed to be correct at the time of publishing and are subject to change without notice, due to factors including, but not limited to, changes in the economic environment, currency fluctuations, and changes to pension and taxation systems.
- The information and figures provided in this document are analyses and simulations based on past data and assumed values, and do not indicate nor guarantee future performance. Analysis methods, models and simulation models are not necessarily perfect and may be substantially affected by assumed values. Please note that contents and/or information may change without notice after the publishing of this document. (Assumed values include, but are not limited to, analysis methods, models, simulations, and the information laid out in this document.)
- In no event shall Mitsubishi UFJ Trust and Banking be liable for any claims, penalties, losses, damages, or expenses, arising out of in connection with, or as a result of the use of this document by the intended recipient or any third party, including, but not limited to, director or indirect loss, consequential loss or damage. Furthermore, it should be understood that any right to claim damages or losses from intended recipients or any third party against Mitsubishi UFJ Trust and Banking shall be expressly waived.
- Mitsubishi UFJ Trust and Banking is the sole owner of the copyright of this document, and quotation or reproduction of this document or any part of it without prior written permission is strictly prohibited.

Mitsubishi UFJ Trust and Banking

MUFG AM Sustainable Investment

Tokyo Shiodome Building, 1-9-1, Higashi-Shinbashi, Minato-ku, Tokyo

105-7322

<https://www.tr.mufg.jp/mufgam-su/english/>

