



2021

ESG REPORT

Government Pension Investment Fund



For All Generations

For All Generations

GPIF is committed to fulfilling our fiduciary duty to secure adequate retirement funds for both current and future beneficiaries.

We believe that improving the governance of the companies that we invest in while minimizing negative environmental and social externalities – that is, ESG (environmental, social and governance) integration – is vital in ensuring the profitability of the portfolio over the long term.



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About GPIF

Government Pension Investment Fund (GPIF) manages and invests Japan's pension reserve fund, which is used to pay Employee Pension Insurance and National Pensions. We contribute to the stability of the pension system by earning returns on our investments and distributing these to the government.

1

Our Mission

Japan adopts a “pay-as-you-go” pension system in which contributions from the current working generation are used to pay the pensions of elder generations. With the birth rate declining and the population aging at a rapid pace, in order to avoid an unduly heavy burden being placed on future generations, pension contributions not immediately applied to the payment of benefits are accumulated as pension reserves and placed under fiscal management so that these payments can continue to be made into the future.

Our mission at GPIF is to contribute to the stability of the national pension system by managing and investing the pension reserves entrusted to us by all beneficiaries. To fulfill its role of contributing to stable pension finance, GPIF has been given an investment return target of 1.7% above nominal wage growth by the Minister of Health, Labour and Welfare. We began managing assets in fiscal 2001, and since then, we have recorded a cumulative return rate of +3.69% (annualized) and total returns of ¥105.4 trillion as of the end of fiscal 2021.

2

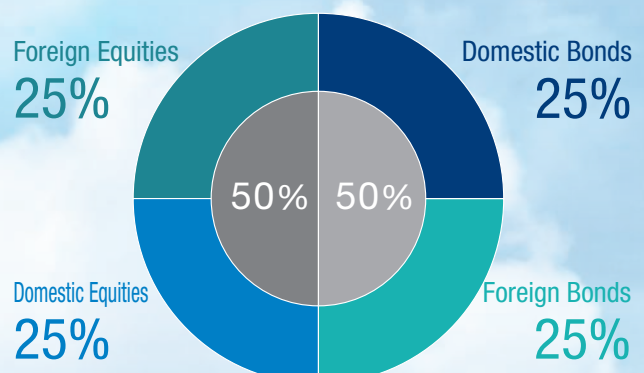
GPIF's Investment Style and ESG (Environmental, Social, and Governance) Investment

Pension reserves managed by GPIF are funds that are projected not to be withdrawn for about 50 years. For this reason, we are able to commit to long-term investments in a variety of assets without being excessively constrained by temporary market fluctuations. With assets under management of approximately ¥196.6 trillion as of March 31, 2022, we invest not in a single asset class but in a broad, diverse range of assets, including equities, bonds, and alternative assets both in Japan and overseas. In doing so, we expect such diversified investment to generate profits from economic activities all around the world and reduce the possibility of major losses.

We are committed to encourage sustainable economic growth and improve long-term returns from all the assets we manage through reducing the negative impact of environmental, social, and other issues on financial markets. We believe that this will contribute to the stability of the public pension system. GPIF promotes ESG integration throughout all

of our investment processes. Of these investments, the assets under management tracking ESG indexes, which could be described as ESG investments in a narrow sense, account for approximately ¥12.1 trillion, and investment in green, social and sustainability bonds is currently at approximately ¥1.6 trillion (as of March 31, 2022).

Current Policy Asset Mix



3

GPIF in Numbers

Universal owner and a Cross-generational investor

GPIF is a “universal owner” that holds a wide range of shares and bonds of a majority of listed companies in Japan and of major overseas companies.

Asset size **¥196.6** trillion

Number of GPIF-owned issues

Equities

5,920 stocks

Investment time horizon

100 years

Bonds

15,033 bonds

ESG Investment

GPIF promotes ESG integration throughout all of our investment processes.

ESG integration (all assets)

¥196.6 trillion

Assets under management tracking ESG indexes

Approx. **¥12.1** trillion

Investments in green bonds, etc.

Approx. **¥1.6** trillion

Long-term Investment Performance

GPIF's long-term investment performance exceeds nominal wage growth of +1.7%.

Cumulative returns (FY2001 - FY2021)

¥105.4 trillion

Excess rate of return (FY2001 - FY2021)

3.69%

External Ratings

GPIF's initiatives in ESG investment are highly rated by external agencies.

Rating by PRI (strategy and governance) (as of March 31, 2022)

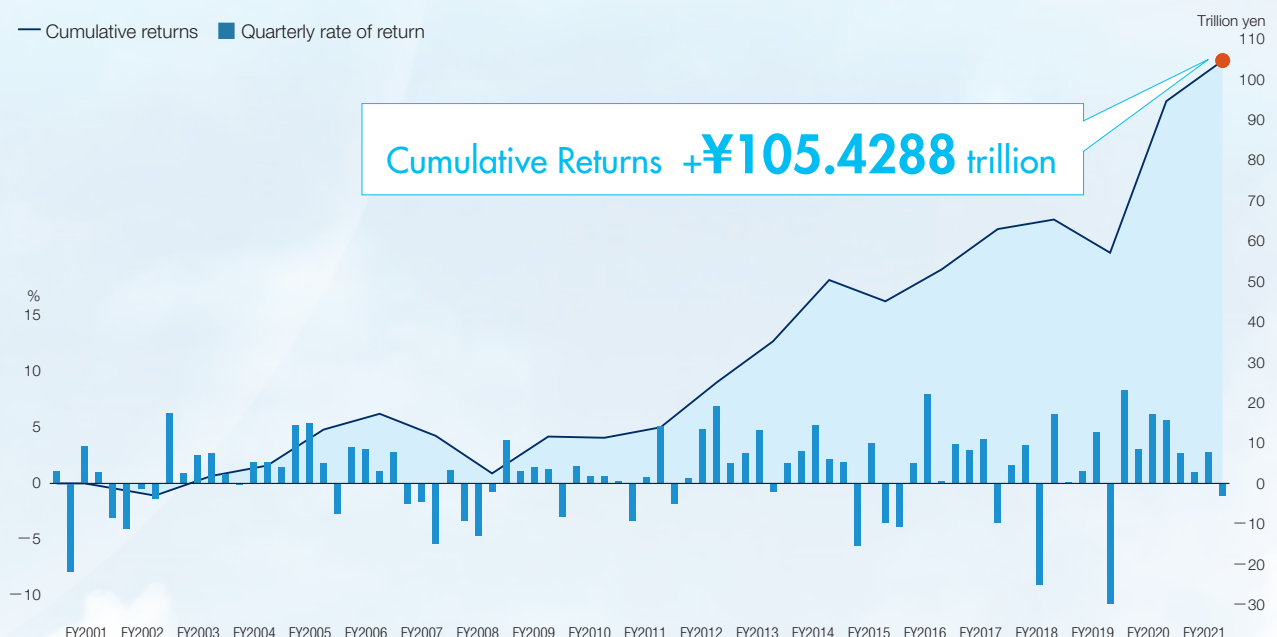
A+

Responsible Asset Allocator Initiative (RAAI) ranking

Leaders

Cumulative Returns since Fiscal 2001

— Cumulative returns ■ Quarterly rate of return



What is ESG?

ESG is the acronym for Environmental, Social, and Governance. While investors have traditionally used cash flows, profit margins and other quantitative financial data to value a company's equity or other securities, "ESG investment" also takes non-financial ESG factors into consideration. GPIF is committed to promoting ESG investment.

1

What is ESG?

The term "ESG" was first popularized in 2006, when the United Nations proposed the Principles for Responsible Investment (PRI) – a new framework for incorporating ESG into the investment process – to institutional investors around the globe. As the world economy has grown, environmental, social, and corporate governance issues that have the potential to negatively impact socio-economic sustainability, such as

climate change, supply chain labor problems, and corporate misconduct, have surfaced, giving rise to concerns about the sustainability of society and the economy.

Based on this recognition, ESG investment is expected to improve risk-adjusted returns over the long term by incorporating environmental, social, and corporate governance perspectives into investment decisions.

Social

Diversity
Supply chain, etc.



Environmental

Climate change
Water resources
Biodiversity, etc.

Governance

Composition of the board of directors
Protection of minority shareholders etc.

2

Why Does GPIF Focus on ESG?

GPIF can be accurately described as a "universal owner"; that is, an investor with a substantial level of assets under management that invests in securities spanning the entire world capital market. Furthermore, the pension reserves managed by GPIF are used to mitigate the burden placed on future generations. Long-term corporate value creation by each investee company and the sustainable, stable growth of the entire capital market is critical for

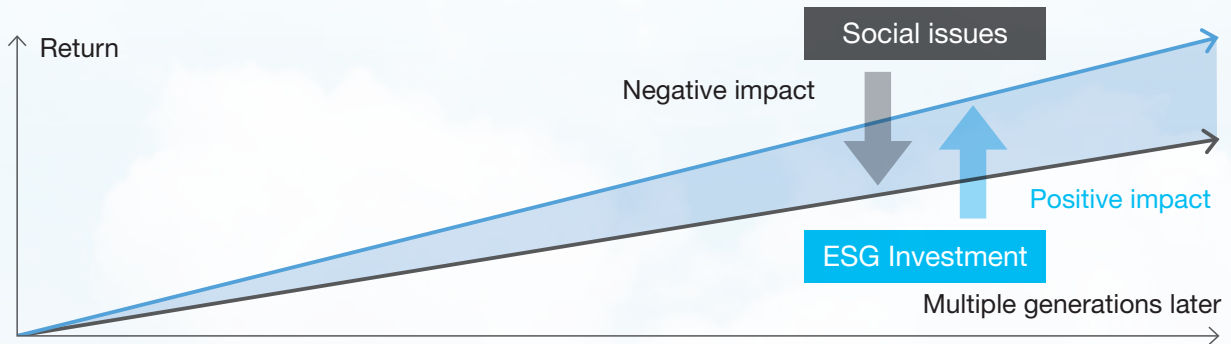
GPIF – a universal owner and cross-generational investor – to achieve stable income over the long run.

For example, if the share prices of some portfolio companies increase as a result of conducting business activities without paying attention to their large impacts on the environment and society for the sake of short-term revenue growth, society and the economy as a whole, including other

companies, are negatively affected by such activities. Consequently, the overall portfolio of the universal owner will be significantly impaired. This “universal ownership” approach of actively working to curb these kinds of negative externalities lies at the core of GPIF’s ESG investment. Given that the likelihood of ESG-related risks materializing becomes greater over the long term, integrating ESG factors into our investment process has great

benefits for GPIF as a cross-generational investor responsible for supporting pension finance designed with time horizon of as long as 100 years. Our ESG initiatives are in line with the Employees’ Pension Insurance Act and the National Pension Act, which require GPIF to manage pension reserves safely and efficiently from a long-term perspective and for the sole benefit of pension recipients.

Minimize negative environmental and social externalities and enhance the long-term return of the portfolio across all asset classes



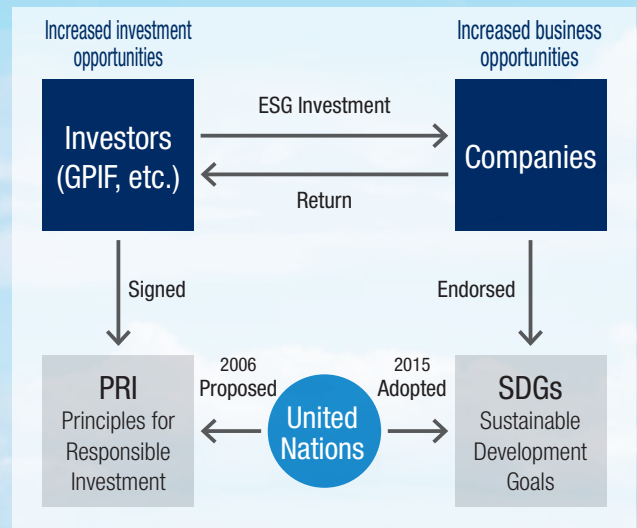
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About the SDGs

The SDGs (Sustainable Development Goals) are international goals set forth by the United Nations in the “2030 Agenda for Sustainable Development” adopted at the UN Summit in September 2015. The SDGs evolved from the Millennium Development Goals formulated by the UN in 2001 and are targeted for achievement by 2030. Consisting of 17 goals and 169 targets, including “Gender Equality,” and “Climate Action,” the SDGs advocate “leaving no one on the planet behind.”

The goals of the SDGs cannot be achieved without private-sector companies. There is enormous demand for products and services that will help to solve the social issues highlighted by the SDGs, such as environment, health, and energy. For this reason, undertaking businesses in line with the SDGs is predicted to bring major profit opportunities for private-sector companies. At its Annual Meeting in 2017, the World Economic Forum announced that initiatives for the achievement of the SDGs had the potential to create at least \$12 trillion in economic value by 2030. Although the ESG issues considered in ESG investment and those of the goals and targets of the SDGs may have different objectives, they

also have much in common, and the former can go a long way toward achieving the latter. We believe that a commitment to the SDGs by investee companies would help to improve their corporate value, while at the same time, the realization of a sustainable economy and society would lead to a better return for all assets managed by GPIF over the long term.



GPIF is committed to fulfilling our fiduciary duty to secure pension reserves for future beneficiaries by investing from a long-term perspective.

Government Pension Investment Fund

President

MIYAZONO Masataka



What do you see as the impacts of Russia's invasion of Ukraine?

In fiscal 2021, mainly due to rises in foreign equities, we secured a 5.42% annual rate of return. However, the fact remains there were many circumstances that required us to make extremely difficult decisions. In particular, in connection with the Russian invasion of Ukraine toward the end of the fiscal year, trading at the Moscow Stock Exchange was suspended and Russia's major banks were cut off from international payment systems. Given these constraints on trading and payments, GPIF evaluated its Russia-related assets practically as zero on its financial statements as of the end of fiscal 2021.

We also received feedback from the media and the public about investments in companies that are believed to be producing controversial weapons. In response to these feedback, we conveyed the government's conclusion that, if GPIF were to instruct our asset managers not to invest in specific companies for humanitarian reasons, this would contravene the statutory requirements that prohibit the selection of individual stocks. GPIF is required by the law to manage pension reserves solely for the benefit of pension recipients from a long-term perspective, thereby helping to fund future pension benefits. We will continue to comply with the law and strive for the safe and efficient management of those pension reserves.



The current international order, which was built up primarily by developed countries such as the United States, Europe, and Japan since the end of the Cold War, has arrived at a major crossroads. Due to circumstances such as the US-China conflict and the disruption of supply chains caused by the spread of COVID-19, where moves to unwind the tide of globalization are already afoot, the recent invasion of Ukraine could accelerate those moves even further. While some point out globalization's negative aspect of growing disparity, globalization has also brought tremendous benefits in the form of global economic growth and price stability. If we are to continue to secure stable investment returns in a highly uncertain world, the premises of which

could change significantly, I believe it is crucial that we adhere to GPIF's basic investment stance of globally diversified investment from a long-term perspective.



Fiscal 2021 was a major turning point for the international order, but has this had an impact on ESG investment?

For some time, there have been moves to add natural gas and nuclear power generation to the EU taxonomy under certain conditions¹. As the Russian invasion of Ukraine has intensified concerns about energy supply, European countries have started to reevaluate coal and nuclear power generation. Until now, these European nations have led the charge in climate

Interview with the President

change response, so moves to change their policies are being criticized in certain quarters as being opportunistic.

However, the need for decarbonization and the significance of achieving this goal have not wavered in the slightest. It is only natural that the path and means for achieving long-term goals should be revised flexibly in light of changing circumstances. I also suppose that the trend toward renewable energy will accelerate from the standpoint of energy security.

Given these changes in situation, it is quite possible that investors' attitudes will also change to a certain extent. For our part, GPIF will need to make rational assessment of how such changes will affect the capital market and, ultimately, to what degree they will impact the risk and return of GPIF's investments.



There was major development in ESG disclosure initiatives in fiscal 2021. Do you have any comments on that ?

That's right. 2021 was a year in which moves to make global consistency of ESG disclosure standards particularly picked up pace. Our major focus is on the efforts to deliver internationally consistent ESG disclosure standards by the International Sustainability Standards Board (ISSB), an organization established by the IFRS Foundation. With regard to ESG disclosure standards, GPIF has long been concerned about the confusion among companies regarding which disclosure standards to follow, given the fact that too many standards are out there. Our another concern is the difficulties that investors face in making comparisons of potential investee companies using the same metric when evaluating their ESG initiatives². Once this situation is resolved, companies will be able to



disclose their ESG information more efficiently, which will encourage more companies to embark on the disclosure of ESG information. Greater consistency of standards will also improve both the quantity and quality of comparisons of companies' disclosures. As a result, it is expected that ESG information will be accurately reflected in the corporate and asset values of investee companies. GPIF will continue to keep a watchful eye on these moves to standardize ESG disclosures.



It has been nearly five years since GPIF started ESG investment tracking ESG indices. What is your assessment of those five years and what can you tell us about GPIF's future directions?

It is too early to give an overall assessment of what we have done in those five years, but I do feel that we are heading in the right direction. For GPIF, as a universal owner and cross-generational investor, in order to achieve stable investment returns over the long term, we believe that it is necessary for our investee companies to enhance their corporate value over the long term and for the capital market as a whole to achieve stable and sustainable growth. It is quite difficult to evaluate quantitatively how much we have contributed to the improvement of sustainability of capital markets, but I do sense a considerable increase in awareness about the importance of ESG integration among external asset managers and companies.

While GPIF is a cross-generational investor

with an investment time horizon of over 100 years, we are also an incorporated administrative agency with Medium-term (five-year) Objectives provided by the Minister of Health, Labour and Welfare. For this reason, we are required to achieve a certain level of investment performance during our Medium-term plan period as well as annual plan periods. Managing long-term risks such as ESG means taking on relative risks (fluctuations in returns) against benchmarks such as TOPIX in the short term. Therefore, we are required to curb long-term ESG risks efficiently and effectively, while also managing those short-term risks. In this regard, the ESG indexes selected by GPIF have so far met or outperformed policy benchmarks. Compared with the performance of all funds being managed under policy benchmark-based investment, we have recorded cumulative excess returns largely surpassing ¥100 billion with our ESG index-based passive investments.

These investments have already reached approximately ¥12.1 trillion, and we will continue to consider the adoption of new ESG indexes. At the same time, as approximately five years have passed since GPIF started ESG index-based asset management, we will also actively engage in reviewing and improving our existing ESG indexes. We will also give positive consideration to the adoption of good active funds that see ESG as a source of excess return.

¹ A proposal was announced in February 2022 for a Complementary Delegated Act to include, under certain conditions, nuclear energy and natural gas power generation activities in the list of acceptable technical standards for sustainable economic activities covered by the EU Taxonomy. As neither the European Parliament nor the Council of the European Union took steps to veto the proposal by July 2022, four months after the Complementary Delegated Act was formally adopted by the European Commission in March 2022, its establishment was finalized.

² *Study of ESG Information Disclosure* (June 2019)

Fiscal 2021

Activity Highlights

In fiscal 2021, GPIF continued to promote ESG activities in new areas. Here we present the highlights of our ESG activities during the year.

Adoption of Additional ESG-Themed Domestic Equity Index



**FTSE Blossom
Japan Sector
Relative Index**

After examining the indexes submitted to the Index Posting System based on the Practical Guidelines for the selection of ESG Indexes, GPIF adopted the FTSE Blossom Japan Sector Relative Index, which is a comprehensive ESG index for domestic equities, and began passive investment based on this index.

▶ Please refer to pages 19 and 20 for details.

Survey of Listed Companies



GPIF conducts an annual survey of companies listed on the First Section of the Tokyo Stock Exchange in order to obtain their feedback on the stewardship activities of our external asset managers and to monitor the nature and progress of their engagement. We also use this survey to understand these companies' ESG disclosure initiatives and to gather their opinions on the ESG indexes we invest in. In our seventh survey conducted in fiscal 2021, we received responses from 709 companies, representing 71.2% of total market capitalization. The survey also indicated increased number of companies making disclosures in line with the TCFD.

▶ Please refer to pages 23 and 24 for details.

Adoption of Additional Engagement-Enhanced Passive Investment



In order to diversify and enhance our approach to stewardship and improve the quality of the entire market through these activities, in fiscal 2018, GPIF selected two external managers – Asset Management One Co., Ltd. and FIL Investments (Japan) Limited – as “engagement-enhanced passive investment managers” for the first time. In fiscal 2021, GPIF selected two more external managers – Sumitomo Mitsui Trust Asset Management Co., Ltd. and Resona Asset Management Co., Ltd.

▶ Please refer to pages 24 to 26 for details.

Engagement with Index Providers and ESG Ratings Agencies



GPIF has been actively engaging in dialogue with index providers and ESG rating agencies since selecting ESG indexes for Japanese equities in 2017. As GPIF's investments are predominantly passive, index providers and ESG rating agencies play a pivotal role in the success or failure of our fund management. GPIF engages in ongoing dialogue with these providers in an effort to improve ESG rating coverage and rating methodologies.

▶ Please refer to pages 27 to 30 for details.

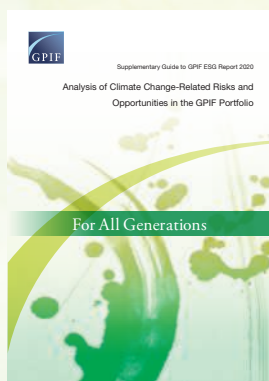
ESG in Alternative Asset Management



GPIF also takes ESG factors into consideration when investing in alternative assets. We examine ESG initiatives in the process of selecting asset managers, and monitor these managers after a mandate is awarded. In this report, we conducted an analysis of reductions in CO₂ emissions at the domestic renewable energy facilities in GPIF infrastructure portfolio.

▶ Please refer to pages 31 and 32 for details.

Publication of the Analysis of Climate Change-Related Risks and Opportunities in the GPIF Portfolio



https://www.gpif.go.jp/en/investment/GPIF_CLIMATE_REPORT_FY2020_EN.pdf



In the “Analysis of Climate Change-Related Risks and Opportunities in the GPIF Portfolio” report published in October 2021, GPIF further enhanced our analysis of disclosures in line with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) by: (1) including the entire supply chain in our greenhouse gas emissions analysis, (2) expanding the analysis to include not only traditional asset classes but also alternative asset classes, and (3) providing an analysis of inter-industry transfer of opportunities and risks accompanying the transition to a low-carbon society. Realistically, it is extremely difficult to accurately predict climate change and the associated risks and opportunities decades into the future. Consequently, the results should be interpreted in a broader context. Nevertheless, we hope this will be of help for investors as well as companies in their consideration of climate change-related risks and opportunities.

ESG-Related Governance and Organizational Frameworks

The Board of Governors discusses and oversees the promotion of ESG and approaches to ESG investment at GPIF. The Executive Office advances ESG initiatives through coordination between the Public Market Investment Department, Investment Strategy Department, Private Market Investment Department, and other departments related to asset management, and reports to the Board of Governors.

Deliberations by the Board of Governors

The Board of Governors, established in October 2017, makes decisions concerning important matters such as the formulation of the policy asset mix and medium-term plans by council decision-making system, and oversees the execution of operations by the Executive Office.

In fiscal 2021, the Board of Governors held 13

meetings, and ESG-related issues were discussed at five of those meetings. The Board of Governors discusses and oversees the promotion of ESG and approaches to ESG investment at GPIF. Details of the discussions by the Board of Governors are posted on the GPIF website in the form of a summary of the proceedings after a certain period of time.

ESG-related items discussed and reported on at Board of Governor meetings

Meeting number	Meeting date		Agenda item
55th	May 2021	Reported matter	ESG Report (Outline)
58th	July 2021	Reported matter	ESG Report (final version)
60th	October 2021	Reported matter	Analysis of Climate Change-Related Risks and Opportunities in the GPIF Portfolio (a supplementary guide to the ESG Report)
65th	March 2022	Reported matter	Adoption of new ESG index
66th	March 2022	Reported matter	Report on stewardship activities in 2021/2022

Status of the Board of Governors

<https://www.gpif.go.jp/operation/board/>

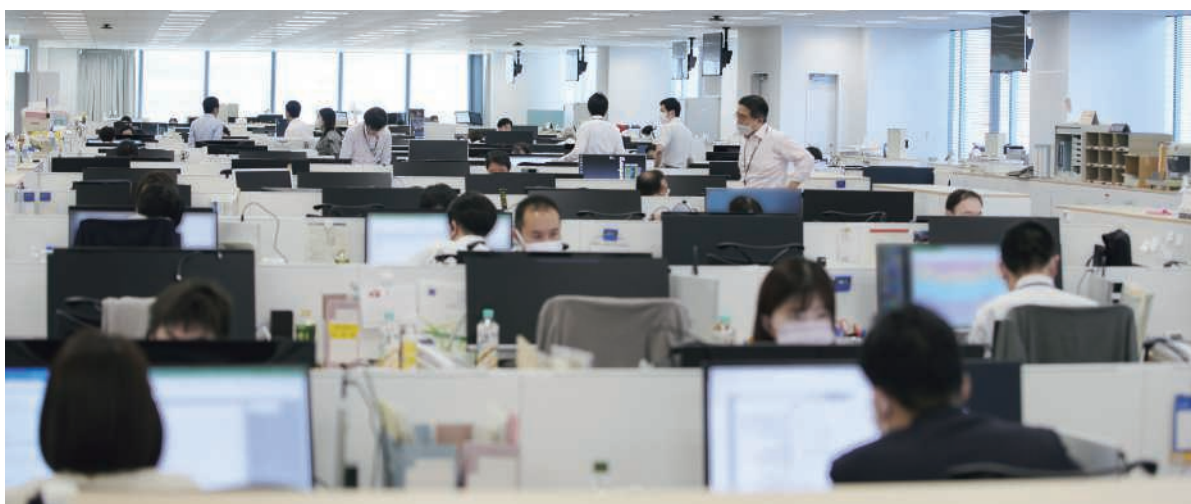
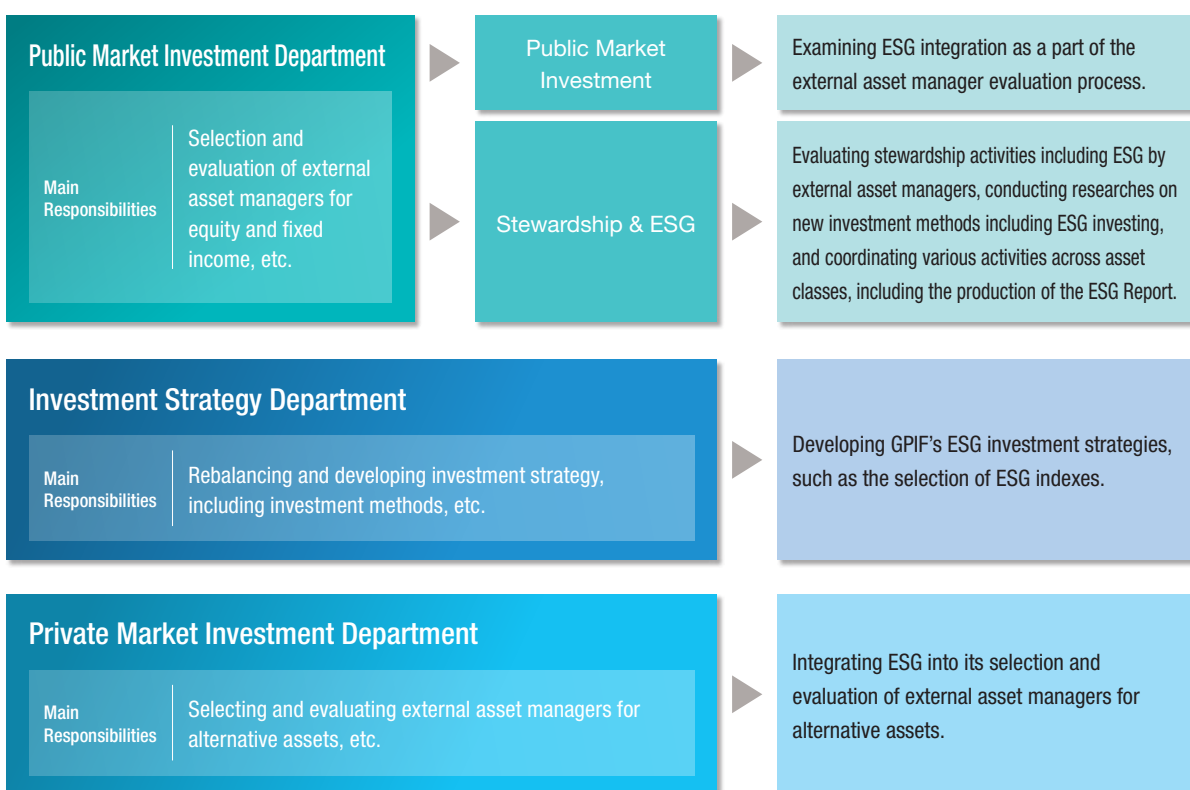


ESG-related Executive Structure

The Executive Office implements ESG initiatives through coordination between the Public Market Investment Department, Investment Strategy Department, Private Market Investment Department, and other departments related to asset management. The Investment Committee, chaired by the Chief Investment Officer (CIO), deliberates and makes decisions on ESG-related initiatives and other asset

management-related issues. Important matters are reported to the Board of Governors after deliberation in the Investment Committee. In addition to comprehensive, regular checks of the portfolio management by the Investment Committee, the status of ESG investments is also monitored from a risk management perspective by the Portfolio Risk Management Committee, which meets monthly.

Key departments responsible for ESG



ESG Initiatives within GPIF

GPIF is committed to promoting ESG investment and promotes initiatives designed to bolster the fund's ESG and SDGs-conscious internal values. Here we present ESG initiatives being undertaken within GPIF.

SDGs and Diversity-Related Initiatives

GPIF's Code of Conduct states, "We are committed to GPIF's mission by promoting communication and teamwork and nurturing a diversity of talents and capabilities." Building on this, in January 2020, GPIF established the SDGs Promotion Group—a committee reporting directly to the President in order to develop initiatives designed to bolster the fund's ESG-conscious internal values. The Group conducts regular training sessions for fund employees on the SDGs, and held four sessions in fiscal 2021. The Diversity and Inclusion Promotion Group (D&I Promotion Group), which was established as a sub-group of the SDGs Promotion Group, with its staff selected by the President, strives to raise awareness of diversity and inclusion within GPIF and to create a work environment in which everyone can work with a sense of purpose. The Group conducted a questionnaire to GPIF employees in fiscal 2021 to ascertain their awareness of the Group and any issues and expectations they have toward the



SDGs training (January 2022)

Group, as well as their views about leave schemes and the status of implementation of remote work. In response to the question, "Do you think GPIF offers a workplace where diversity and inclusion perspectives are taken into account?" 73% of respondents answered in the affirmative. Their free comments in the survey revealed the high level of interest in

FY2021 SDGs training

May 2021	<p>Considering the SDGs from Global Population Trends Lecturer: HAYASHI Reiko, Deputy Director-General of National Institute of Population and Social Security Research</p> <p>Response (excerpt) - I found it very beneficial to learn about global demographics, which is a key theme in the consideration of financial markets.</p>
December 2021	<p>Results of Questionnaire on SDGs Training Lecture: GPIF Staff members *No post-lecture staff questionnaire was conducted for this session.</p>
January 2022	<p>Part 1: The Workplace and LGBT Part 2: Social Circumstances Surrounding LGBT / LGBT and the Law Lecturer: INABA Hiroki, Director of Lawyers for LGBT & Allies Network, Head of LGBTQ+ Network in Japan, Senior Counsel of Goldman Sachs Japan Co., Ltd. Lecturer: FUJITA Naosuke, Co-Representative Director of Lawyers for LGBT & Allies Network, Attorney</p> <p>Response (excerpt) - I was most impressed by the fact that changes in the consciousness of co-workers have led to changes in LGBT people's own approach to their work.</p>
March 2022	<p>Noufuku (Agriculture-Welfare Collaboration) and the New Society and Economy Lecturer: MINAGAWA Yoshitsugu, Chairman and Director of Japan Agriculture-Welfare Collaboration Association</p> <p>Response (excerpt) - It was an excellent opportunity to discover and learn about things I had no previous knowledge of regarding collaboration between agriculture and welfare.</p>

diversity and inclusion among GPIF employees as well. Also the fiscal 2021 survey was the first time to sought a wide range of opinions about work from home due to COVID-19. This feedback provided valuable reference for the revision of GPIF's Employment Rules and the establishment of Work-from-Home Regulations in fiscal 2021. Training on LGBT issues conducted in January 2022 also attracted strong interest. Lessons learned by the participants through specific case studies included the fact that superiors and colleagues showing their support for the anxieties and concerns by LGBT employees will help to create a workplace in which diverse personnel can participate actively. The D&I Promotion Group will continue its efforts toward the achievement of the SDGs.

The advancement of women in the workplace is a crucial part of diversity promotion. In FY2021, GPIF compared the scores of GPIF and eight Japanese external asset managers for the five metrics that companies are required to disclose under the Act on Promotion of Women's Participation and Advancement in the Workplace. These five metrics are also the quantitative evaluation metrics used in the MSCI Japan Empowering Women Index (WIN). GPIF appears to have room to improve in the areas of recruitment and promotion of female employees. Meanwhile, only two Japanese external asset managers disclose all five metrics, for which it is hoped further improvements in disclosure made in future.

Women in the workplace at GPIF

	(1) % Female New Hires	(2) % Women in the Workforce	(3) Difference in years men and women are employed by the company* (%)	(4) % Women in Senior Management	(5) % Women on Board (Officers)**	
GPIF	11.8	28.7	-40.3	8.3	16.7	
Japanese external asset managers	Average	26.7	31.8	-6.1	10.7	8.8
	Min./Max.	0.0/41.2	22.1/39.1	-28.0/17.6	5.4/16.9	0.0/22.0
	Disclosure rate	50.0	62.5	62.5	87.5	50.0

(Note 1) GPIF's data for (1) is for fiscal 2021; all other data is as of March 31, 2022 or April 1, 2022.

Data for external asset managers was obtained from the Database of Companies Promoting Women's Advancement in April 2022.

(Note 2) (3) Difference in years men and women are employed by the company* = (Average years women employed – Average years men employed) / Average years men employed.

This ratio is highly sensitive to changes in hiring and retirement due to GPIF's small workforce (174 employees) and thus fluctuates significantly from year to year.

**% Women on Board (Officers) is the percentage of women on the Board of Governors. Governors are appointed by the Minister of Health, Labour and Welfare.

(Note 3) Companies included in the data for external asset managers are the eight Japanese external asset managers with GPIF mandates that disclose their information on the Database of Companies Promoting Women's Advancement in April 2022.

(Source) GPIF, Database of Ministry of Health, Labour and Welfare Companies Promoting Women's Advancement

Environmental Initiatives

As part of our environmentally-conscious initiatives, GPIF established a "Basic Policy on Promoting Green Procurement" for fiscal 2021 based on the Act on Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities (Green Procurement Act). Pursuant to this policy, GPIF works to ensure that the paper and stationery, office furniture, office equipment, appliances, and other office products we use have a minimal impact on the environment. In fiscal 2021, we purchased more office furniture and equipment than usual due to the expansion of our offices and changes to office layouts. Efforts to procure items that leave a smaller environmental footprint were successful, with over 92% of our purchases complying with the Green Procurement Act.

To reduce paper consumption, in principle, all meetings, including Board of Governors and Investment Committee meetings, are paperless. We ask asset managers and ESG rating agencies to provide meeting materials in advance in electronic form, and use tablets, laptops, and other devices to view these presentations. In addition to these initiatives, in fiscal 2021, the enhancements to our remote work frameworks made in response to the COVID-19 pandemic resulted in about 70% less copier paper being purchased and approximately 78% less paper used per employee compared with fiscal 2017, when we started promoting paperless meetings.

Support for TCFD and Climate-Related Financial Disclosures

Climate change risks occur simultaneously across all companies and asset classes, making it difficult to eliminate them completely merely through diversification. As these risks are highly likely to manifest over the long term, we believe that, as an asset owner, GPIF should take the lead in addressing them.

Climate-Related Financial Disclosure Consistent with TCFD Recommendations

The Financial Stability Board (FSB) established the Task Force on Climate-related Financial Disclosures (TCFD) in December 2015, and in June 2017, the TCFD released their recommendations on how companies and others can better disclose information related to climate change risks and opportunities. The recommendations published by the TCFD outline a series of information disclosure practices for companies and other organizations in (1) governance, (2) strategy, (3) risk management, and (4) metrics and targets, in relation to climate change.

Although the potential impact may vary in size, for investors, climate change risks occur simultaneously across all companies and asset classes and cannot be completely eliminated through diversification. Moreover, these risks are highly likely to manifest at least over the long term, and we therefore believe that GPIF, as an asset owner, should take the lead in addressing them. We therefore declared support for the TCFD in December 2018 and began disclosing information in accordance with the TCFD recommendations in that fiscal year's ESG Report. The analytical methods used to measure climate change risks are evolving year by year. For the 2021 ESG Report, we have attempted to analyze the transition risks and physical risks for each asset class from a different angle from past years. We have based our transition risk analysis on the Transition Pathway Initiative and on perspectives including carbon neutrality and greenhouse gas emissions reduction targets. We also conducted physical risk analysis based on multiple scenarios.



It is difficult to separate climate change-focused investment from ESG activities as a whole, and GPIF regards climate change as one of the most important themes in ESG activities in general. Accordingly, our disclosures include all ESG activities and are not confined to initiatives that relate only to climate change. This section presents an overview of what information GPIF discloses for the four TCFD disclosures, along with the corresponding pages in this report.

GPIF will work to enhance the sustainability of the entire market by further improving its disclosure on ESG in general, including climate change-related financial information.

Governance Disclose the organization's governance around climate-related risks and opportunities

- GPIF's Investment Principles and Stewardship Principles clearly state that climate change and other ESG factors shall be taken into account in fund management, and GPIF actively works to achieve this (page 84).
- The Board of Governors, which oversees the Executive Office, receives reports on ESG from the Executive Office as necessary (page 13).
- The Executive Office, which consists of officers and employees under the President, convenes Investment Committee meetings to make decisions on climate change and other ESG-related initiatives. The Office also develops organizational frameworks for implementing these initiatives (page 14).

Strategy Disclose the actual and potential impacts of climate related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

- As a universal owner, GPIF stresses sustainable improvement of the corporate value of each investee company, by minimizing the impact of environmental and social issues and fostering the long-term sustainability of society as a whole (page 84).
- In the belief that global moves toward decarbonization will have an effect on our portfolio, GPIF has adopted both top-down and bottom-up approaches to confirm developments in carbon neutral policies and whether or not companies have set decarbonization targets (pages 59-64)
- GPIF proactively integrates ESG across all asset classes. In equity investment, we incorporate external asset managers' ESG activities into their evaluations as well as conduct passive investment based on ESG indexes (page 21). In fixed income investment, we propose investment opportunities in ESG bonds to our external asset managers (page 21). We also promote ESG integration in our alternative investments (pages 31-32).
- In relation to the environment (E) in particular, we use indexes for equity investment that focus on each company's carbon efficiency (pages 19-20) and invest in green bonds (pages 21-22).
- In addition to measuring the carbon footprint of GPIF's portfolio (pages 57-58), we also assess the physical and transition risks and opportunities of the various climate scenarios and estimate their impact on investment returns (pages 71-78).

Risk management Disclose how the organization identifies, assesses, and manages climate-related risks.

- GPIF is developing an organizational framework for monitoring the greenhouse gas (GHG) emissions (carbon footprint and carbon intensity) of our entire portfolio as well as for each fund for which we outsource the management.
- As well as requiring asset managers to actively engage with companies on key ESG issues (pages 23-26), GPIF engages with index providers to encourage improvement in the evaluation techniques used within the methodologies of the carbon efficient indexes and ESG indexes for domestic and foreign equities that GPIF adopts (page 27-30).

Metrics and targets Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

- GPIF aims to control portfolio risks and secure opportunities for investment return by contributing to curbing greenhouse gas (GHG) emissions across the entire economy, through engagement with external asset managers and ESG investment (pages 19-20 and 23-26).
- GPIF calculates the Scope 1 to Scope 3 carbon footprint and compares these with each portfolio benchmark by asset class. We also calculate each portfolio's carbon intensity using weighted average carbon intensity (pages 55-58).
- Using Climate Value-at-Risk (CVaR), GPIF estimates climate change-related transition and physical risks as well as opportunities for investment return (Pages 71-78).

ESG Index Adoption and ESG Index-Based Asset Management

In order to improve the long-term risk/return profile of the portfolio by reducing ESG risks, GPIF adopts several ESG indexes as benchmarks for passive investment. In fiscal 2021, we adopted the FTSE Blossom Japan Sector Relative Index, which is a new comprehensive ESG index for domestic equities.

Adoption of Additional ESG Index for Domestic Equities

GPIF has used ESG indexes as passive benchmarks since fiscal 2017. We believe that passive investment based on indexes that focus on corporate sustainability will not only improve the risk/return profile of the portfolio over the long run, but also enhance the Japanese equity market through secondary effects such as the improvement of ESG ratings.

In fiscal 2021, GPIF screened those comprehensive ESG indexes for domestic equities that were posted on the Index Posting System, the framework for collecting index information on a continuous basis. Emphasis was given to the following criteria in the screening, and a decision was made to adopt the FTSE Blossom Japan Sector Relative Index.

Primary screening criteria:

- (1) ESG ratings play a central role in the constituent selection/weighting process.
- (2) ESG ratings for the index are highly transparent, and the evaluation method is easy to understand for companies so that the index can be expected to boost overall market.
- (3) The index does not include negative screening, such as excluding companies in specific sectors or industries.

- (4) The index has a relatively small tracking error compared to a parent index and is a tilted index with a large investment capacity or an index with a large number of constituents.





In its selection of constituents, the FTSE Blossom Japan Sector Relative Index assesses companies mainly from (1) a focus on FTSE's ESG ratings, which are also used by the FTSE Blossom Japan Index, which GPIF adopted in fiscal 2017. In addition, including (1) criteria the index stocks are assessed based on the remaining two perspectives of (2) the company's carbon intensity (greenhouse gas emissions per sales), and (3) management attitude toward climate change risks and opportunities. To gauge (3) management attitude toward climate change risks and opportunities, the index uses the TPI Management Quality Score (see Pages 65-66 for details) provided by the Transition Pathway Initiative. This is a global initiative established by British asset owners in 2017 to assess the status of companies' preparations for the transition to a low-carbon economy and support climate change action.

GPIF's Expanding ESG Investment





GPIF has expanded our ESG index-based investment from starting passive investment in three domestic equity ESG indexes in fiscal 2017. GPIF adopted FTSE Blossom Japan Sector Relative Index in fiscal 2021, which is the eighth ESG indexes (domestic and foreign equities) that we invest in, as of March 31, 2022, as shown on the table at right. The total asset size of passive investments tracking ESG indexes has

expanded to ¥12.1 trillion. Please refer to "ESG Index Performance" on pages 41 and 42 for information on the performance of each index. By investing in these indexes, GPIF aims to enhance long-term investment returns through the sustainable growth of our investees and of the market as a whole.

Comprehensive ESG Indexes

	 FTSE Blossom Japan Index	 FTSE Blossom Japan Sector Relative Index	 MSCI Japan ESG Select Leaders Index	 MSCI ACWI ESG Universal Index (ex Japan and ex China A-shares)
Concept and characteristics of index	<ul style="list-style-type: none"> - This index uses the ESG assessment scheme used in the FTSE4Good Japan Index Series, which has one of the longest track records globally for ESG Russell indexes. - It is a broad ESG index that selects stocks with high absolute ESG scores and adjusts industry weights to neutral at the industry level. 	<ul style="list-style-type: none"> - Assessments are performed based on FTSE Russell's ESG rating which FTSE Blossom Japan Index also uses. For the companies with high carbon intensity (greenhouse gas emissions/ sales), management attitude toward climate-change risks/opportunities is also assessed. - The index selects stocks with relatively high ESG ratings within each industry, and adjusts industry weights to neutral at a sector level. 	<ul style="list-style-type: none"> - The MSCI Japan ESG Select Leaders Index is a broad ESG index that integrates various ESG risks into today's portfolio. The index is based on MSCI ESG Research used globally by more than 1,000 clients. - The index is comprised of stocks with relatively high ESG scores in each industry. 	<ul style="list-style-type: none"> - One of MSCI's flagship ESG indexes, this broad index adjusts the weight of constituents based on each issuer's current ESG rating and ESG trends to elevate the ESG metrics of the index overall. - The index was developed for large investors seeking to enhance ESG integration while achieving the same level of investment opportunity and risk exposure as the parent index.
Index construction	Best-in-Class	Best-in-Class	Best-in-Class	Tilted
Investment Target	Domestic Equities	Domestic Equities	Domestic Equities	Foreign Equities
Constituent universe (Parent index)	FTSE Japan All Cap Index (1,395 stocks)	FTSE Japan All Cap Index (1,395 stocks)	MSCI Japan IMI Top 700 (699 stocks)	MSCI ACWI ex Japan ex China A ESG Universal with Special Taxes Index (2,180 stocks)
Number of index constituents	229	493	222	2,111
Assets under management (Billion yen)	983.0	800.0	2,099.0	1,618.7

ESG Thematic Indexes (women's advancement / climate change)

	 MSCI Japan Empowering Women Index ("WIN")	 Morningstar® Developed Markets Ex-Japan Gender Diversity IndexSM (GenDi)	 S&P/JPX Carbon Efficient Index	 S&P Global LargeMidCap Carbon Efficient Index
Concept and characteristics of index	<ul style="list-style-type: none"> - MSCI calculates the gender-diversity scores based on information disclosed under the Act on Promotion of Women's Participation and Advancement in the Workplace and selects companies with higher gender diversity scores from each sector. - The first index designed to cover a broad range of factors related to gender diversity. 	<ul style="list-style-type: none"> - Determines investment weighting based on assessment of companies' commitment to gender equality, using the Equileap Gender Equality Scorecard. - Ratings are conducted in four categories: (1) gender balance in leadership and workforce; (2) equal compensation and work-life balance; (3) policies promoting gender equality; and (4) commitment, transparency, and accountability. 	<ul style="list-style-type: none"> - Constructed by S&P Dow Jones Indices based on carbon data provided by Trucost, a pioneer in environmental assessment. - This index is designed to overweight companies that have lower carbon footprints (annual greenhouse gas emissions divided by annual revenues) and that actively disclose their carbon emission information. 	<ul style="list-style-type: none"> - Constructed by S&P Dow Jones Indices based on carbon data provided by Trucost, a pioneer in environmental assessment. - This index is designed to overweight companies that have lower carbon footprints (annual greenhouse gas emissions divided by annual revenues) and that actively disclose their carbon emission information.
Index construction	Best-in-Class	Tilted	Tilted	Tilted
Investment Target	Domestic Equities	Foreign Equities	Domestic Equities	Foreign Equities
Constituent universe (Parent index)	MSCI Japan IMI Top 700 (699 stocks)	Morningstar® Developed Markets Ex-Japan Large-Mid (2,177 stocks)	TOPIX (2,175 stocks)	S&P Global Ex-Japan LargeMidCap (3,080 stocks)
Number of index constituents	352	2,149	1,855	2,428
Assets under management (Billion yen)	1,245.7	419.5	1,567.8	3,390.6

(Note) Data is current as of March 31, 2022

(Source) Prepared by GPIF based on data from FactSet and individual index providers.

ESG in External Equity and Fixed Income Management

When GPIF evaluates our external asset managers, we examine their ESG initiatives on their management of our equity and fixed income assets. We have also formed partnerships with several multilateral development banks and governmental financial institutions to expand investment opportunities in green and other ESG-related bonds.

ESG Integration in Asset Manager Evaluations

Most of GPIF's portfolio assets are managed by external asset managers in Japan and overseas. The Public Market Investment Department and Investment Strategy Department work together to select and evaluate these asset managers. Managers are evaluated on their investment policies, asset management processes, organizational structure and human resources. ESG integration is a key part of the investment process review.

As a PRI signatory, in 2018 we defined ESG integration as “the explicit and systematic inclusion of ESG factors into investment analysis and investment decisions,” based on the definition provided by PRI.

In fiscal 2019, we established evaluation criteria for ESG

integration based on this definition and began comprehensive assessment for asset managers according to these new criteria. In addition to assessing evaluating existing external asset managers, the new ESG integration criteria are also used when selecting new external asset managers.

Although an increasing number of asset managers emphasize ESG and are explicitly and systematically including it in their investment analysis, there are no established methods for assessing how and to what degree ESG factors have an impact on corporate value, and individual asset managers have adopted their own various initiatives in this regard. We hope to see further progress in this and other areas of ESG integration among asset managers in the future.

ESG Integration in Fixed Income Investments

GPIF and the World Bank Group have been working together to promote ESG integration in fixed income investment through efforts such as publishing a joint research paper entitled “Incorporating Environment, Social and Governance (ESG) Factors into Fixed Income Investment” in 2018.

Following up on this research, the International Bank for Reconstruction and Development (IBRD) and the International Finance Corporation (IFC)—both members of the World Bank Group—drew up a new proposal in 2019 to provide GPIF's external asset managers with an opportunity to invest in green, social and sustainability bonds.

GPIF provides its external asset managers with opportunities to both integrate ESG into their fixed income investments and gain excess return over government bonds

by building platforms in which they can invest in green, social and sustainability bonds issued by multilateral development banks and governmental financial institutions. The initiative, launched in collaboration with IBRD and IFC, has since expanded to more of the world's major multilateral development banks. As of March 31, 2022, we have built investment platforms with ten multilateral development banks and six governmental financial institutions as issuers.

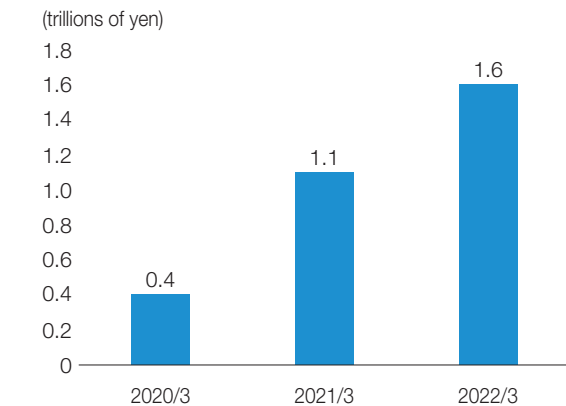
GPIF is committed to promoting ESG-based investment, not only in equities but also in fixed income and other assets, in order to limit negative environmental and social externalities and enhance the long-term return of the portfolio across all asset classes.

Breakdown of Green, Social and Sustainability Bonds in GPIF's Portfolio

Three years have passed since GPIF first formed its partnership with the World Bank Group in 2019. As more and more countries and companies have expressed their commitments to carbon neutrality in that time, there has been a sharp rise in the number of green, social and sustainability bonds (ESG bonds) issued. GPIF has a diverse portfolio of ESG bonds.

GPIF's external asset managers make their own investment decisions to invest in ESG bonds through investment platforms and other channels on GPIF's behalf. The size of those investments has grown to around ¥1.6 trillion as of March 31, 2022 (Figure 1). Green bonds account for 65% of the total, followed by sustainability bonds (19%) and social bonds (16%) (Figure 2). Compared with the breakdown of the global ESG bond market according to the Climate Bond Initiative (CBI)², the

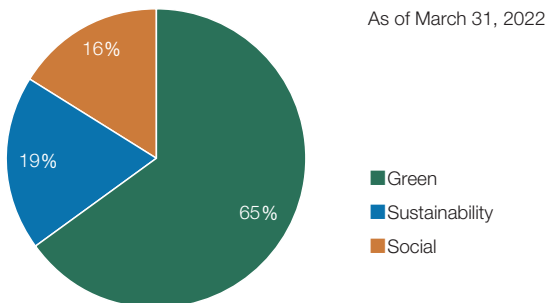
Figure 1. ESG Bond Investment¹ Trends



(Source) GPIF

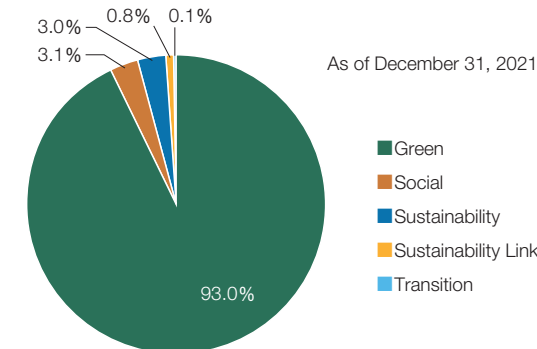
proportion of green bonds is slightly smaller in GPIF's ESG bond portfolio, while sustainability and social bonds account for slightly higher percentages (Figure 3).

Figure 2. Breakdown of GPIF's ESG Bond Portfolio (By Type)



(Source) GPIF

Figure 3. Global ESG Bond Market by Bond Type



(Note) The proportion of each type was calculated based on the cumulative issue value (including previously redeemed issues) as of December 31, 2021.

(Source) Prepared by GPIF based on Sustainable Debt Global State of the Market 2021 (Climate Bonds Initiative)

International Organizations with Investment Platforms in Green Bonds, etc.



1 Track record in investment in bonds, calculated by GPIF, based on Bloomberg data, in compliance with International Capital Market Association (ICMA) principles, etc.

2 Sustainable Debt Global State of the Market 2021, Climate Bonds Initiative (CBI)

Stewardship Activities and ESG Promotion

When GPIF first engaged in activities to fulfill our stewardship responsibilities (“stewardship activities”), the initial focus was on equity asset managers. We expanded the scope of those activities to all assets after revising our Investment Principles in October 2017 and our Stewardship Principles in February 2020.

Survey of Listed Companies

GPIF conducts an annual survey of companies listed on the First Section of the Tokyo Stock Exchange in order to get their feedback on the stewardship activities of our external asset managers and to monitor the nature and progress of their engagement. We also use the survey to understand these companies' ESG disclosure initiatives and to gather their opinions on the ESG indexes we invest in. In our seventh survey conducted in fiscal 2021, we received responses from 709 companies, representing 71.2% of total market capitalization.

In the results of the fiscal 2021 survey, for the first time, Climate Change was selected as the most critical theme of corporate ESG activities. The largest jumps in the rates of recognition as major themes were for Climate Change (+14.3%), Diversity (+11.8%), and Human Rights and Community (+6.2%). This suggests an increased awareness among companies of the supplementary principles added in the revision of the Corporate Governance Code. The number of companies endorsing TCFD also climbed from 208 to 382, 249 of which were already disclosing information in line with TCFD, up from 139 in fiscal 2020.

Figure 1. Responses to the Question, “What are the major themes of the ESG activities of your company?” (Multiple responses allowed, up to five)

Rank	(previous survey)	Theme	This survey	Previous survey	Change
1	2	Climate Change	77.9	63.6	+14.3
2	1	Corporate Governance	71.7	71.7	±0
3	3	Diversity	55.0	43.2	+11.8
4	5	Human rights & Community	43.2	37.0	+6.2
5	4	Health & Safety	38.8	40.6	-1.8
6	7	Risk Management	27.9	28.6	-0.7
7	6	Product Liability	27.5	30.7	-3.2
8	8	Supply Chain	24.3	23.5	+0.8
9	9	Disclosure	21.2	20.4	+0.8
10	10	Board Structure & Self-evaluation	14.1	17.1	-3.0

(Note) The top 10 of 25 themes selected are shown.

Critical ESG Issues Cited by External Managers

GPIF's Stewardship Principles require external asset managers to engage proactively on critical ESG issues. On that basis, every year, GPIF surveys our asset managers for equity and fixed income investment on what ESG issues they consider to be critical.

All passive equity managers, who are required to hold investee companies' shares for extended periods of time, cited “Disclosure,” “Climate Change,” “Diversity,” and “Supply Chain”

as critical issues. They viewed long-term challenges, such as environmental (E) and social (S) issues, as being of particular importance. A major change from the previous year's survey was the increase in asset managers that view “Biodiversity” as a critical ESG issue. “Corporate Governance” also newly emerged as a critical ESG issue among all passive managers for domestic equities.

Meanwhile, active managers, who primarily invest for shorter periods from several months to several years, differed in what they consider to be critical ESG issues, depending on whether they manage Japanese or foreign equities. For foreign equities, all asset managers considered “Climate Change” to be a critical issue, whereas for Japanese equities, all asset managers cited “Board Structure and Self-evaluation,” “Minority Shareholders Rights (cross-shareholdings, etc.)” and “Disclosure” as critical issues, indicating that they saw G (governance) themes as more important. With all active managers of domestic equities choosing “Disclosure” as a

critical issue, whether passive or active, shared their view of importance of this issue.

In the survey of fixed income investment managers, which was held for the second time in fiscal 2021, the range of issues has widened, with over half of domestic bond managers newly citing “Supply Chain,” “Diversity,” “Environmental Opportunities,” and “Misconduct” as critical issues. Although the issues selected by over half of foreign bond managers were nearly unchanged from last year, the percentages of which considered each theme important have increased for all of them.

Figure 2: Critical ESG Issues Recognized by External Asset Managers (%)

Domestic Equities – Passive	Domestic Equities – Active	Foreign Equities – Passive	Foreign Equities – Active	Domestic Bonds	Foreign Bonds
Climate Change 100	Board Structure & Self-evaluation 100	Climate Change 100	Climate Change 100	Disclosure 100	Climate Change 95
Corporate Governance 100	Minority Shareholder Rights 100	Supply Chain 100	Supply Chain 86	Climate Change 93	Corporate Governance 70
Disclosure 100	Disclosure 100	Disclosure 100	Disclosure 86	Corporate Governance 79	Health and Safety 70
Supply Chain 100	Supply Chain 88	Diversity 100	Corporate Governance 86	Board Structure & Self-evaluation 64	Supply Chain 65
Diversity 100	Climate Change 88	Corporate Governance 75	Other (Social) 86	Supply Chain 57	Pollution & Resources 65
Misconduct 100	Capital Efficiency 88	Other (Social) 75	Health and Safety 86	Diversity 57	Human Rights & Community 65
Board Structure & Self-evaluation 83	Diversity 75	Health and Safety 75	Board Structure & Self-evaluation 86	Environmental Opportunities 57	Labor standards 65
Minority Shareholder Rights 83	Misconduct 75	Board Structure & Self-evaluation 75	Human Rights & Community 86	Misconduct 57	Anti-corruption 60
Capital Efficiency 83	Human Rights & Community 75	Water Stress & Water Security 75	Social Opportunities 71		
Human Rights & Community 83	Waste Management 75	Other (Governance) 75			
Biodiversity 83		Other (Environment) 75			
		Deforestation 75			
		Risk Management 75			
		Biodiversity 75			

(Note) The percentage represents the ratio of the number of managers which selected the relevant issues to the number of each asset management method. Only the issues cited as “critical ESG issues” by more than 70% of equity asset managers and more than 50% of fixed investment asset managers are listed. For domestic equities, if an asset manager is entrusted to both active and passive mandates, it is counted as one with larger amount of mandate entrusted by GPIF.

(Source) Survey of GPIF's external equity and fixed investment asset managers as of December 2021

...E (Environment)
 ...S (Social)
 ...G (Governance)
 ... Multiple ESG themes

Expansion of “Excellent Disclosure” Series

As noted above, the importance of information disclosure is growing among both companies and asset managers. GPIF believes in the importance of the disclosure of non-financial information, including ESG, in dialogues between companies and investors. From that

perspective, in fiscal 2021, we expanded our “Excellent Disclosure” series (Excellent Integrated Reports and Excellent Corporate Governance Reports selected by GPIF's asset managers), with the publication of Excellent TCFD Disclosure.

Engagement-Enhanced Passive Investment

In order to improve the overall market through stewardship activities and to diversify and enhance our approach to these activities, in fiscal 2018 we selected two external managers – Asset Management One Co., Ltd. and FIL Investments (Japan) Limited – as “engagement-enhanced passive investment models.” In selecting these managers, we focused on (1) the establishment of appropriate KPIs and (2) engagement system and method. Since the

compensation level differs from that of regular passive managers, we conduct an annual review of each manager and renew these mandates based on each company's progress on the KPIs specified in their engagement plans and the next fiscal year's milestones. In fiscal 2021, we selected Sumitomo Mitsui Trust Asset Management Co., Ltd. and Resona Asset Management Co., Ltd. from the multiple applications received.

Strengths of Newly Adopted Engagement-Enhanced Passive Investments

Sumitomo Mitsui Trust Asset Management Co., Ltd.

One of the strengths of the Sumitomo Mitsui Trust Asset Management's engagement-enhanced passive fund is where engagement is promoted through the commitment and active participation of their top management. The investee companies with which they engage are selected based on 12 ESG themes and 27 priority activity items coming from their ESG materiality. For each investee company, they set long-term goals for each ESG theme, corresponding to the company's situations, as well as medium-term goals backcasting from the long-term goals, as the basis of the engagement. When selecting the goals and targets, by combining with a bottom-up approach from a business viewpoint, the effectiveness of the engagement increases. They monitor the status of progress in engagement by setting milestones in six stages, from issue setting to the resolution.

Interview with Engagement Officer

FUKUNAGA Keisuke, Chief Stewardship Officer, Sumitomo Mitsui Trust Asset Management Co., Ltd. (Interviewed in May 2022)

1 What are the strengths of passive investment engagement?

Since in passive investment, assets are held over extended periods of time, we can hold dialogues about corporate value from an ultra-long-term perspective. This makes much easier to have constructive dialogue with investee companies, as the timeframe considered by the management and our engagement timeframe being aligned. In the case of active investment, depending on the outcomes of engagement and the annual performance, there will be times when asset managers need to sell the stocks without exercising voting rights. On the other hand, with passive investment, by taking engagement outcomes into consideration when deciding on our votes, we are able to encourage the companies to take effective initiatives. This is another advantage of passive investment.

2 What engagement issues do you hope to focus particular efforts on?

At the moment, in the E (environment) domain, which we currently view as an area we should focus the most, climate change and environmental business opportunities are the central issues, though we intend to broaden the scope to include other issues as well. In the S (social) domain, we will focus our efforts in particular on promoting the use of human capital, wellness-oriented management, and human rights issues. In G (governance), in addition to the promotion of business portfolio transformation and capital efficiency improvements, we will focus our efforts on the reduction of cross-shareholdings and on the appointment of female directors, which are key issues in terms of our voting decisions.

Resona Asset Management Co., Ltd.

A major feature of Resona Asset Management's engagement is its use of in-house AI to analyze the state of investee companies' integrated reports. In that analysis, the AI will set the focal points of the engagement managers' analysis on integrated reports as evaluation items, and the AI assigns scores to them to clarify each company's issues. The engagement managers will feed back those assessment scores to the target company. They will also conduct dialogue on the company's "value creation story" and encourage them to enhance its corporate value, which is eventually triggered by the improvement of non-financial information (integrated reports) disclosure and the quality of information. Resona will set milestones for each company's progress towards improving corporate value, and will monitor the engagement progress, from issue setting to issue solving. The assessment scores are monitored to observe the progress of its financial values.

Interview with Engagement Officer

MATSUBARA Minoru, Executive Officer and Head of the Responsible Investment Division, Resona Asset Management Co., Ltd. (Interviewed in May 2022)

1 What are your expectations on engagement under this mandate?

To increase the value of the Japanese equities market, what is essential is the improvement of ROE, which is at a lower-level compared to the international standard, as well as the improvement of valuation. Once ROE exceeds a certain level, the importance of the latter will relatively increase. Under this mandate, our engagement objective is to elevate the valuation of Japanese companies through raising market's confidence by achieving improvements and effectiveness of information disclosures. We believe that, from a long-term perspective, this will help to improve the overall market.

2 What are your expectations to the Japanese companies as your investee and engagement target?

Frameworks for the disclosure of non-financial information are on their way to being established on a global level. In addition to active corporate disclosures, I expect that the consistent implementation of the corporate strategies and measures will reduce the gap between potential corporate value and long-term share prices and will lead to the correction of disclosure discounts and the capital costs reduction. I also hope that, the companies will attract the world's risk appetite money through active disclosure. Lastly, I expect the company to allocate their management resources into more innovative projects, and to actively tackle the global ESG issues such as climate change, and lead their businesses to success.

(Note) The descriptions and interviews regarding engagement by Sumitomo Mitsui Trust Asset Management Co., Ltd. and Resona Asset Management Co., Ltd. are intended as disclosure information regarding GPIF's engagement-enhanced passive managers and are not a recommendation of the products, etc. managed by these two companies.

Engagement with Index Providers and ESG Ratings Agencies

GPIF has been actively engaging in dialogue with index providers and ESG ratings agencies since selecting ESG indexes for Japanese equities in 2017. We have held an ongoing dialogue with these agencies regarding (1) the expansion of companies subject to ESG rating; (2) the promotion of dialogue between ESG ratings agencies and companies; (3) improvement of ESG rating methods; and (4) the governance frameworks of ESG ratings agencies and index providers.

Topics Discussed with Index Providers and ESG Ratings Agencies

In the press release “ESG Indices Selected” announcing the adoption of ESG indexes for Japanese equities in July 2017, GPIF explained three focus points in its selection of ESG indexes, namely (1) that the index uses a “positive screening” methodology, in other words that equities with high ESG scores are selected; (2) that ESG is evaluated based on publicly available information and the assessment methods and results would be disclosed; and (3) that the

governance frameworks and conflict-of-interest management of ESG rating agencies and index providers are robust. Almost five years have passed since then, and GPIF believes that the importance of those three points has in no way diminished. This section provides details on GPIF's engagement with index providers and ESG rating agencies since the adoption of ESG indexes with regards to these three points.

Figure 1. Topics Discussed with Index Providers and ESG Rating Agencies

Dialogue Theme	Background and Purpose
(1) Expansion of ESG rating coverage	Increasing the number of companies that are provided ESG ratings and included in ESG indexes will serve as an incentive for these companies to improve their ESG ratings, thus improving the sustainability of the market as a whole.
(2) Promotion of Dialogue with ESG rating agencies and companies	In order to enhance the precision of ESG ratings, there is a need to enable better comparison of information on companies subject to ESG rating by encouraging them to disclose more ESG information.
(3) Improvement of ESG rating methodologies	For the improvement of ESG rating methodologies, there needs to be the promotion of constructive dialogue between ESG rating agencies and companies by making detailed ESG rating methodologies publicly available and by providing appropriate feedback to companies about their ESG rating outcomes.
(4) Governance Framework of ESG Ratings Agencies and Index Providers	For ESG indexes in particular, constituent stocks and their weights vary greatly depending on each firm's ESG rating, so a high degree of transparency and neutrality are required when determining ESG ratings and constituents.

Expansion of ESG Rating Coverage

When selecting ESG indexes, GPIF has emphasized the importance of providing a broad range of companies with the opportunity to be selected as constituents, rather than categorically excluding specific industries or companies from eligibility. This is based on our belief that the possibility of index inclusion acting as a driver to encourage companies to improve their ESG profiles is the key to enhancing the sustainability of the market as a whole.

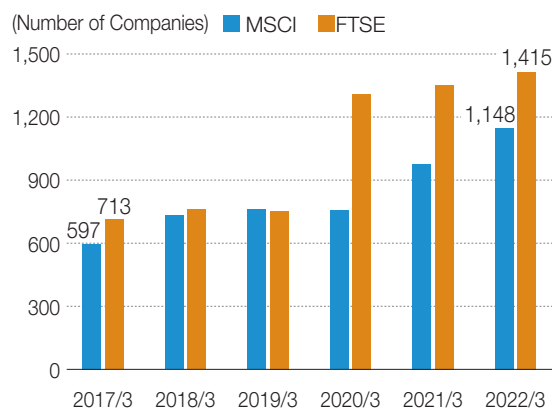
Despite this, ESG index eligibility is naturally constrained by the ESG rating universe. In many cases, companies are excluded from eligibility merely because they are not covered by the relevant ESG rating agency, and in our survey of listed companies, many have called for an expansion of ESG rating coverage.

On the other hand, for ESG rating agencies, expanding the coverage universe means a greater investment of management resources, including hiring more analysts. Over the course of ongoing discussions with them, however, the rating agencies have indicated that they understand the importance of expanding the ratings universe, and both FTSE and MSCI have made major strides in increasing the number of companies they cover (Figure 2). As a result, the number of stocks eligible for the MSCI Japan Empowering Women Index increased to the top 700 stocks by market capitalization in November 2019. For the FTSE Blossom Japan Index, the scope of companies eligible for inclusion expanded significantly to include small-cap stocks in

December 2020. In addition, the number of stocks eligible for the MSCI Japan ESG Select Leaders Index increased to the top 700 stocks by market capitalization in November 2018, and the scope of companies eligible for inclusion will expand even further with the change in parent index to MSCI Japan IMI in May 2022.

Currently, limited management resources and other issues have impeded information disclosure for smaller companies as opposed to larger ones. Even compared with foreign companies of a similar size, these smaller companies have lower ESG scores. We hope that expanding ESG index inclusion eligibility to small-cap stocks will lead to greater interest in ESG ratings by smaller companies and, ultimately, to an enhancement of their ESG initiatives.

Figure 2. Trends in Japanese Equities Included in ESG Rating Universe



(Source) FTSE Russell. Reproduced by permission of MSCI ESG Research LLC ©2022.

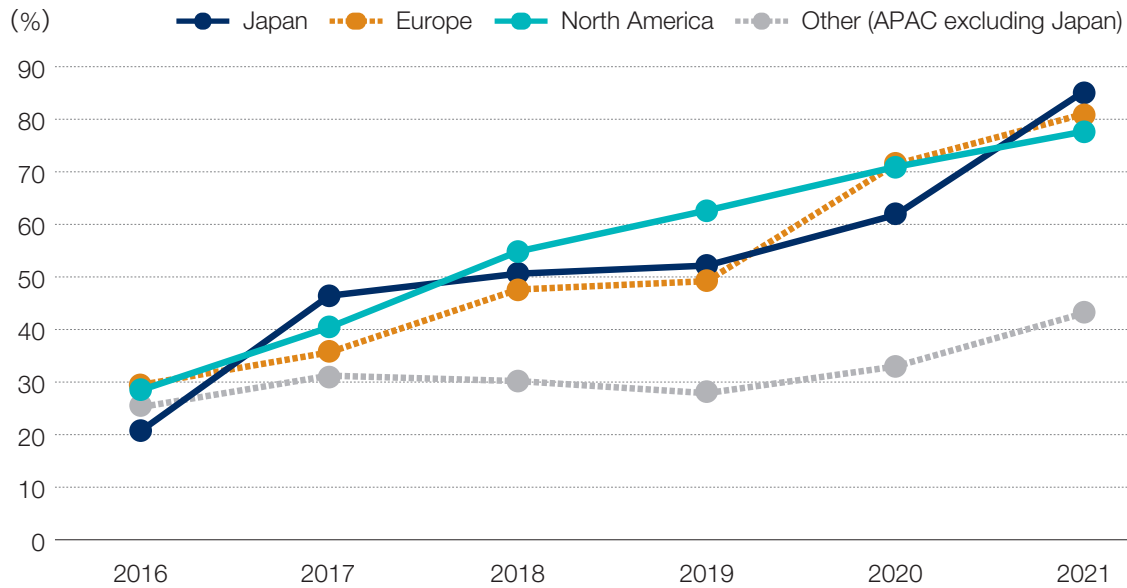
Promotion of Dialogue with ESG Ratings Agencies and Companies

As in previous years, GPIF conducted feedback meetings with ESG rating agencies during fiscal 2021 to discuss the inquiries and opinions they received from the companies that they rate. More and more firms are consulting with ESG rating agencies over the course of the rating process, and according to MSCI, Japan is counted as one of the areas with the highest rate of companies that consult with them

out of the world's major economies. (Figure 3).

The percentage of companies that contact MSCI during the ESG rating process is also increasing, and data from MSCI clearly shows that the more actively a company consults with them, the greater the improvement in their ESG rating.

Figure 3. Percentage of Companies Consulting with MSCI During the ESG Rating Process



(Note) Constituents in individual indexes at the end of each year (December) were used to calculate the rate of inquiries
 (Source) Reproduced by permission of MSCI ESG Research LLC ©2022.

Improvement of ESG Rating Methodologies

As GPIF's investments are predominantly passive, index providers and ESG rating agencies play a pivotal role in the success or failure of our fund management. GPIF engages in dialogue with index providers and ESG rating agencies to improve the sustainability of the market and enhance our long-term investment performance. In our press release in July 2017 announcing the selection of ESG indexes for Japanese equities, we pointed out that ESG ratings vary widely among rating agencies, and that “better ESG information disclosure by companies” and “improvement of ESG rating methodologies” would be required for more accurate ESG rating .

We have seen some positive changes with respect to the former, with a greater number of large-cap companies in particular producing integrated reports and ESG reports, and an increase in the number of companies disclosing information on climate change risks and opportunities in line with the TCFD framework.

Meanwhile, ESG rating agencies are also working to improve their methodologies. When they consider changing these methodologies, ESG rating agencies provide end users such as asset managers and pension funds with an opportunity to express their opinions (consultations), similar to when they consider changes to index methodologies. In March 2022, S&P Dow Jones Indices is planning to apply new index rules to its index methodologies such as the S&P/JPX Carbon Efficient Index, and seeking feedback from market participants about including information disclosure in line with TCFD recommendations in the index methodologies. In addition to regular meeting, GPIF actively exchanges opinions with ESG rating agencies through consultations and other opportunities. FTSE and MSCI are working to improve their rating methods through continuous engagement with GPIF and other ESG rating users (Figure 4).

Dialogue with ESG Ratings Agencies



There are still significant discrepancies in ESG ratings between different agencies. Since analysts' opinions differ even in their assessment of companies based on financial information, we will likely never see a complete convergence in their assessment of companies based on non-financial ESG information. Nevertheless, GPIF believes that ESG information

needs to be reflected in the evaluation of companies in more appropriate ways, by improving rating methodologies, enhancing information disclosure, and standardizing disclosure criteria. As a reference point to ascertain the current situation, we monitor the ESG rating correlation between FTSE and MSCI every year (Please refer to page 46 for details).

Figure 4. Major Changes in FTSE and MSCI ESG Rating and Index Methodologies in 2021

FTSE Changes	
Timing	Major Changes
June 2021	ESG Rating: Change in rating methods for climate change themes
	Background: To change from the previous rating method, which was based on scores within the theme, to a rating method that assesses the performance of company initiatives using 16 criteria consistent with TCFD Description: Climate change governance initiatives will be evaluated in stages using climate change-related criteria such as risk awareness, strengthening of internal management structure, strategic integration and director supervision.
June 2021	Change in index methodology: Additional climate change-related theme score criterion for new constituents
	Description: Companies in industry sectors with high carbon intensity are required a climate-related theme score of at least 3, while companies in other sectors required a score of at least 2. The above criterion has also been applied to existing constituents in index reviews as of June 2021. Any company that fails to meet these criteria will be given a 12-month grace period, and if there is no improvement after that 12 months, the company will be excluded from the index.
MSCI Changes	
Timing	Major Updates
November 2021	Change in index methodology: MSCI Japan Empowering Women Index (WIN)
	Description: To control index turnover ratio, a buffer rule was set in the gender diversity score. The lowest gender diversity score within the index's 65th percentile was adopted as the gender diversity score buffer baseline. Even if a company's gender diversity score falls below the median of the industry sector, it will be retained in the index as long as its score is equal to or greater than the score buffer baseline.

(Source) Prepared by GPIF based on data from FTSE and MSCI. FTSE Russell. Reproduced by permission of MSCI ESG Research LLC ©2022.

Governance Framework of ESG Rating Agencies and Index Providers

Similar to asset managers, index providers and ESG rating agencies play a pivotal role in GPIF's fund management. Index-tracking passive investments account for approximately 90% of our equity portfolio, and since the stocks we invest in and the weights of these investments are determined by the indexes calculated by index providers, these providers arguably play a critical role in determining the success or failure of our investments.

For ESG indexes in particular, constituent stocks and their weights vary greatly depending on each firm's ESG rating, so the companies that conduct these evaluations bear a particularly great responsibility. As such, similar to external asset managers, GPIF conducts due diligence of index providers and ESG rating agencies when selecting ESG indexes. We assess their governance structures to ensure the transparency and neutrality of their ESG ratings and

index constituent selection processes.

Overseas index providers had been leading Japanese index providers in terms of initiatives for strengthening their governance frameworks. However more recently, positive changes have been observed among Japanese providers as well. With the aim of ongoing improvement of indexes, Japan Exchange Group has established an Index Advisory Panel to provide opportunities for GPIF and index users from domestic and overseas asset managers to exchange opinions. In April 2022, Japan Exchange Group transferred the operation of its information services division, including the calculation of stock price indexes, to JPX Market Innovation & Research, Inc. Operation of the Index Advisory Panel was also transferred to this company accordingly. This change could be described as a move to enhance the independence of index calculations.

ESG in Alternative Asset Management

GPIF has been developing initiatives to properly integrate ESG in its alternative asset manager selection and post-selection monitoring process.

ESG in Alternative Assets

The holding period for alternative assets (infrastructure, real estate, and private equity) is generally quite long, and in many cases, the asset manager itself is involved in the corporate management and business operations of the investee. As a result, more asset managers are focusing on integrating ESG into their investment processes not only for identifying the risks encountered during the holding period but also for finding opportunities for sustainable asset value growth and improvement of corporate value. This trend is particularly prominent among overseas asset managers.

Although we use the collective phrase “alternative asset management”, ESG factors and its impacts vary, depending on the individual characteristics of the asset and/or business in question. Approaches to ESG integration also differ depending on individual investment strategies. With an understanding of these differences, GPIF as an asset owner evaluates asset managers' approach to ESG and monitors the status of their investment.

(1) ESG Ratings When Selecting Asset Managers

Since GPIF began selecting alternative asset managers that adopt a multi-manager strategy in April 2017, we have added an evaluation of prospective asset managers' ESG initiatives to its screening criteria. Screenings are conducted from many different

aspects, including through due diligence questionnaires, interviews with ESG staff, and evaluations by third-party consultants. Among other things, we look at the manager's company-wide ESG policies, ESG integration in the investment process, their oversight systems, and how they report to investors after an investment is made. All asset managers selected by GPIF have signed the Principles for Responsible Investment (PRI).

(2) Post-Investment Monitoring

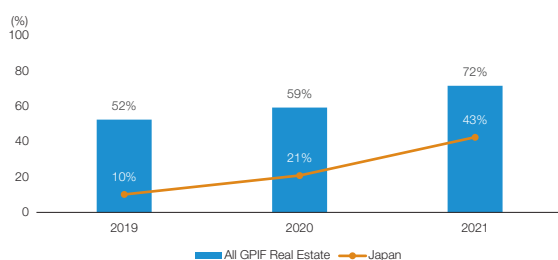
There is still no standardized rating criteria for ESG factors that can be applied across all alternative assets. As such, each asset manager creates its own unique ESG rating criteria and scoring methodology based on the characteristics of the asset and the fund manager's investment strategy. GPIF monitors asset managers for any changes in their ESG-related organizational structure, whether or not the diversified funds in which they invest are managed by PRI signatories, and the status of their ESG initiatives. As well as requiring individual asset managers to provide a report detailing the status of their ESG-related investment capabilities and initiatives, we engage in regular dialogue with them to understand the status of the ESG-related aspects of their portfolios.

Real Estate Portfolio Initiatives / GRESB (Global Real Estate Sustainability Benchmark)

In 2021, 72% of the funds in GPIF real estate portfolio by value participated in GRESB Real Estate Assessment (weighted average asset value as of the end of December each year). This was an increase of 13%, or 5 funds, from the previous year. Even in the Japanese private

real estate fund market, where awareness towards GRESB has been relatively low, the increasing number of funds, mainly private REITs, have started to report to GRESB, contributing to an increase in the participation rate of the entire GPIF real estate portfolio in 2021.

Trends in GRESB Participation Rate (All GPIF real estate / Japan)



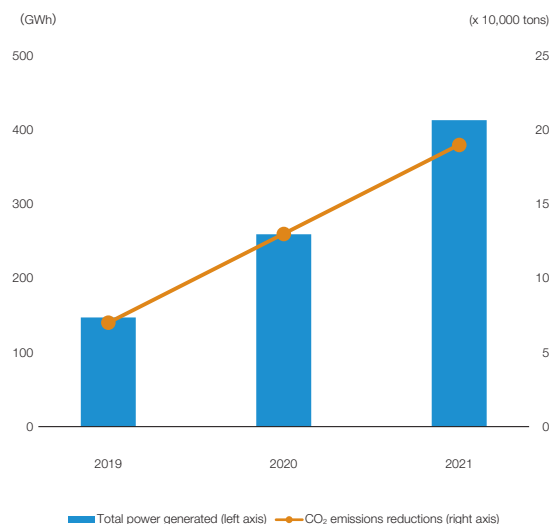
GRESB is an investor-led organization that provides a standardized benchmark and validated data of the ESG performance of Real Assets including Real Estate and Infrastructure. GPIF joined GRESB in fiscal 2019 as an investor member in the real estate sector.



Analysis of CO₂ Emissions Reduction from Renewable Energy Projects in GPIF Infrastructure Portfolio

We analyzed the CO₂ emissions reductions at the domestic renewable energy facilities in GPIF infrastructure portfolio. Total power generated and CO₂ emissions reductions by the domestic renewable energy facilities in which GPIF invests through infrastructure funds are increasing as the investments proceed, as shown in the figure on the right. Total power generated in 2021 was approximately 413 GWh. In calculations based on the power generation figures, using the Japan Photovoltaic Energy Association (JPEA) guidelines or the CO₂ emissions coefficients announced by Japanese electric power companies, the amount of CO₂ emissions that could be reduced by replacing fossil-fuel based power generation facilities with renewable energy is approximately 190,000 metric tons. This is equivalent to approximately 102,000 households' annual CO₂ emissions from electricity per household.

Total Power Generated and CO₂ Emissions Reductions of GPIF's Holdings in Domestic Renewable Energy Projects



(Note) Total power generation and CO₂ emissions are calculated according to GPIF's holding percentage of end investees.

Column

ESG Initiatives in Domestic Infrastructure Investments

DBJ Asset Management Co., Ltd., an external asset manager with GPIF mandate which focuses mainly on infrastructure investment opportunities in Japan, formulates the policy for ESG initiatives in infrastructure investment and confirms the status of investees' endorsement of PRI and TCFD through their investment process and post-investment monitoring, as well as their governance structure and other factors. DBJ Asset Management also conduct ESG diligence according to the characteristics of the infrastructure in question.

When considering investments in renewable energy funds or projects, which are the core part of GPIF's current domestic infrastructure investments, DBJ Asset Management confirms investee companies' efforts to achieve coexistence with local communities, the impacts on local communities caused by the reflection from solar panels and the use of pesticides for weeding, and their initiatives toward climate change and environmental conservation. In post-investment monitoring, in the event of natural disasters such as typhoons, heavy snow or earthquakes, DBJ Asset Management communicates with the fund managers of investee companies to confirm the recovery status and measures to prevent disasters. DBJ Asset Management also hires external consultants to further advance ESG initiatives.

ESG Integration in Solar Power Facility

The domestic infrastructure market is witnessing a surge of investment in the solar power sector as efforts are made globally to reduce greenhouse gas emissions by lowering energy generation using fossil fuels.

In particular investment project for a large-scale solar power station in an industrial district in Japan, an environmental impact assessment revealed the presence of a dragonfly designated as a national endangered species of wild fauna or flora. Prior to this investment, DBJ Asset Management confirmed that careful consideration had been given to the ecosystem during the formulation of construction plans with the securing of a pond to protect the species' habitat.



Joint Study on Diversification Effects and Portfolio Efficiency of ESG Investments

We believe that the effects of ESG investments cannot be measured by simple risk and return metrics and that many other different aspects need to be evaluated. In this column, we present details of a joint study conducted in fiscal 2021 on the diversification effects and portfolio efficiency of ESG investments.

In fiscal 2021, GPIF conducted a joint study on the diversification effects and portfolio efficiency of ESG investments with Associate Professor Tatsuyoshi Okimoto of the Australian National University (now Professor at Faculty of Economics, Keio University). The joint study addressed four research projects and obtained the following valuable results.

Research Projects

- (i) Contribution of ESG indexes to diversification effects and portfolio efficiency
- (ii) ESG index performance and market conditions
- (iii) Impact of ESG Scores on corporate value and excess investment
- (iv) Impact of ESG scores on corporate credit spread

Major Research Results

- (i) Including the MSCI Japan Empowering Women Index may improve risk/return of domestic equity portfolio and increase diversification effects.
- (ii) After market decline phases and after periods of low market volatility, MSCI Japan Empowering Women Index (WIN) may

perform better than its parent index, MSCI Japan IMI, and the MSCI Japan ESG Select Leaders Index.

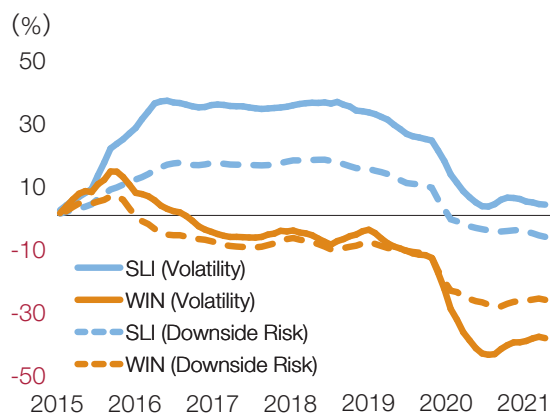
- (iii) ESG scores tend to significantly increase enterprise value (Tobin's q) as awareness of ESG indexes increases. Further, there is no evidence that ESG scores induce investment behavior in excess of the standard investment level of companies expressed with the use of investment coefficients.
- (iv) Companies' high ESG ratings significantly lower credit spread, which has a larger impact on companies with low credit. Further, the credit-spread lowering effect in certain factors such as human rights (S) and governance (G) has become greater in recent years.

This column provides an overview of the joint study, with a focus on projects (i) and (ii).

(i) Contribution of ESG indexes to diversification effects and portfolio efficiency

This project verified the hypothesis that incorporating ESG indexes would improve diversification effects and portfolio efficiency. First, by comparing the volatility of the ESG Index and TOPIX, it was found that the volatility and downside risks of the

Figure 1. ESG Index and Cumulative Differences in TOPIX Volatility and Downside Risk*



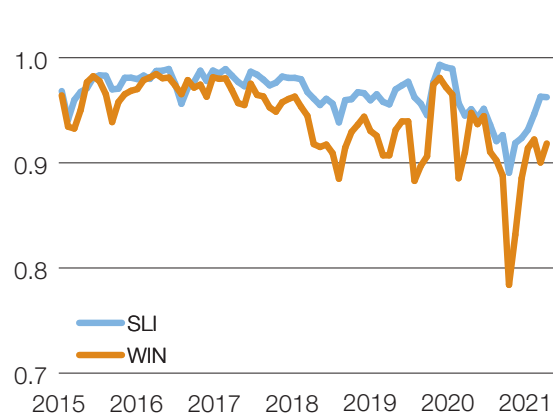
(Note) Cumulative differences in volatility over each 3-month period between Jan. – Mar. 2015, Feb. – Apr. 2015 ... Jun. – Aug. 2021: ESG index and TOPIX volatility (standard deviation of return) for each 3-month period are accumulated and the difference is calculated.

Residual Correlation: For each 3-month period, residual values were calculated using the FF5 model and the correlation of the residual values was calculated.

*Downward risk is a calculation of volatility using only negative returns.

(Source) Joint Study on Diversification Effects and Portfolio Efficiency of ESG Investments

Figure 2. ESG Index and TOPIX Residual Correlation



MSCI Japan Empowering Women Index (WIN) is consistently lower than those of TOPIX, and that the downside risk of the MSCI Japan ESG Select Leaders Index (SLI) has been declining in recent years (Figure 1). In order to measure the relationship between ESG indexes and TOPIX, the study used the Fama-French Five-Factor Model (FF5 Model¹) to calculate residuals with major risk factors removed, and then calculated the correlation between the residuals. As a result, the correlation between the WIN and SLI indexes and TOPIX has been declining year by year (Figure 2).

(ii) ESG index performance and market conditions

While existing research has shown that there is no difference between the average performance of ESG indexes and traditional equity indexes², this project verified the hypothesis that performance may differ between the two depending on market conditions. Specifically, we examined whether there is a period when the performance of the WIN exceeds that of the MSCI Japan IMI (IMI)³, WIN's parent index, and SLI, and if so, what kind of market conditions prevailed during that period.

The FF5 Model was used for this analysis. In the FF5 model, α is a measure of performance, and if α is positive and significant, it indicates that a return is being gained. Applying a smooth transition model that incorporates variables to express market conditions into the ESG index's α and extending it to the smooth-transition FF5 model, in which α changes in line with market conditions, the project examined whether or not, and if so

how, the ESG index's α is dependent on market conditions. Two categories of market conditions were considered, namely Category 1: high/low state of performance of stock market (IMI index return) for the previous five weeks, and Category 2: high/low state of market volatility (volatility of IMI index) for the previous five weeks.

Analysis results found that, when Category 1 market conditions were used, the WIN index's α tended to be higher in the month following five-week periods of low stock market performance, while on the other hand, the SLI index's α was not greatly dependent on market performance in the previous five-week period (Figure 3). When Category 2 market conditions were used, it was found that the WIN index's α tended to be higher in the month following five-week periods of low stock market volatility and lower in the month following five-week periods of high volatility while on the other hand, the SLI index's α was not greatly dependent on the market volatility in the previous five-week period (Figure 4).

Joint Study on Diversification Effects and
Portfolio Efficiency of ESG Investments
(Only in Japanese)



Figure 3: Results of Estimation of Smooth-Transition FF5 Model Using Category 1 Conditions

Index	α_1	α_2	MKT	SMB	HML	RMW	CMA	R ²
WIN	0.207	-0.121	0.974	-0.124	-0.056	0.034	0.078	0.970
p value	0.001	0.177	0.000	0.000	0.124	0.527	0.111	
SLI	0.061	-0.068	0.956	-0.156	-0.049	-0.049	-0.025	0.975
p value	0.268	0.637	0.000	0.000	0.182	0.379	0.687	

α_1 : α of current month after five-week period of poor market performance α_2 : α of current month after five-week period of favorable market performance

Figure 4: Results of Estimation of Smooth-Transition FF5 Model Using Category 2 Conditions

Index	α_1	α_2	MKT	SMB	HML	RMW	CMA	R ²
WIN	0.166	-0.186	0.978	-0.132	-0.051	0.031	0.047	0.969
p value	0.022	0.038	0.000	0.000	0.123	0.590	0.328	
SLI	0.084	-0.101	0.959	-0.163	-0.051	-0.055	-0.042	0.975
p value	0.146	0.253	0.000	0.000	0.168	0.342	0.462	

α_1 : α of current month after five-week period of low market volatility α_2 : α of current month after five-week period of high market volatility

(Source) Joint Study on Diversification Effects and Portfolio Efficiency of ESG Investments

¹ FF5 Model: The Fama-French Five Factor Model adds return and investment factors to the original three factors of the Fama-French Three-Factor model, namely market risk, company size and book-to-market value, for the explanation of return fluctuations. It is expressed with the following formula.

$$R_i - R_f = \alpha + \beta_1 \text{MKT} (R_M - R_f) + \beta_2 \text{SMB} S$$

$$R_i - R_f = \alpha + \beta_1 \text{MKT} (R_M - R_f) + \beta_2 \text{SMB} S + \beta_3 \text{HML} \text{HML} + \beta_4 \text{RMW} \text{RMW} + \beta_5 \text{CMA} \text{CMA} + \epsilon_i$$

R_i : Return of asset i ; R_f : return of risk-free asset; R_M : market return; SMB: company size factor; HML: book-to-market value factor; RMW: return factor; CMA: investment factor

² Peilleux, J, Boubaker, S, and Comyns, B, 2021, *Does it pay to invest in Japanese women? Evidence from the MSCI Japan Empowering Women Index*, Journal of Business Ethics, 170, 595-6133

³ MSCI Japan IMI Index is a market capitalization-weighted index targeting all Japan listed equities (large-, medium- and small-cap equities)

Collaboration with Overseas Public Pension Funds and Other Institutions

GPIF collaborates with a wide range of domestic and global institutions. In fiscal 2021, GPIF was named by American think tank, New America, as a Leader in the 2021 Leaders List of “The 30 Most Responsible Asset Allocators.”

November 2016 **Joined the Thirty Percent Coalition and the 30% Club**

Both the Thirty Percent Coalition in the U.S. and the 30% Club in the U. K. are initiatives that seek greater diversity in listed company boards by increasing the proportion of female board members to 30%. GPIF has participated in the Thirty Percent Coalition in the U.S. and the Investor Group of the 30% Club in the U. K. as an observer since November 2016. Since December 2019, we have also participated in the 30% Club Japan Investor Group.



2015

2016

September 2015 **Signed the Principles for Responsible Investment**

GPIF has been stepping up its ESG initiatives since we signed the PRI in September 2015. Every year, we report our ESG initiatives to the PRI and receive a full assessment on how we are progressing. We also participate in various committees, including the Asset Owner Technical Advisory Committee, Global Policy Reference Group, and Japan Network Advisory Committee. We have earned a rating of A+, the highest rating, for strategy and governance in our assessment as of March 31, 2022.

Signatory of:



April 2018 **Published a Joint Research Paper with the World Bank Group**

In 2018, GPIF and the World Bank Group published a joint research paper entitled “Incorporating Environment, Social and Governance (ESG) Factors into Fixed Income Investment.” Following up on this research, in April 2019, the International Bank for Reconstruction and Development (IBRD) and the International Finance Corporation (IFC) – both members of the World Bank Group– drew up a new proposal to provide GPIF’s external asset managers with an opportunity to invest in green bonds. This initiative has led to partnerships with other international financial institutions and governmental financial institutions in various countries.



2018

October 2018 **Joined Climate Action 100+**

Climate Action 100+ is an investor-led climate change initiative launched in September 2017. Members of this initiative hold constructive dialogues with companies that have a significant impact on the resolution of climate change issues. Participants discuss improving climate change-related governance, making efforts to reduce greenhouse gas emissions, and enhancing information disclosure. Currently, 700 investors(*) participate in the initiative, including pension funds and other asset owners as well as asset managers. GPIF has participated in Climate Action 100+ as a supporter since October 2018, and also participates as an asset owner in the Asia Advisory Group (AAG), which advises the Steering Committee on circumstances and conditions in the Asia region.

*As of June 2022



December
2018**Declared Support for the TCFD**

GPIF declared our support for the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) in December 2018. We commenced information disclosure in accordance with the TCFD recommendations in August 2019 with our ESG Report 2018 and have done so every year since.

November
2020**Joined JPX ESG Knowledge Hub**

The ESG Knowledge Hub, established by the Japan Exchange Group (JPX), is a platform that aims to encourage listed companies to disclose ESG information by providing one-stop access to content and information that will assist in understanding ESG investment. Another goal of the Hub is to eventually form a community linking listed companies with investors and related organizations. GPIF joined the ESG Knowledge Hub as a supporter when it was first established in November 2020.



Support for Listed Companies' ESG Disclosure



<https://www.jpx.co.jp/corporate/sustainability/esgknowledgehub/index.html>

2019

2020

August
2019**Joined ICGN**

International Corporate Governance Network (ICGN) is an international network of institutional investors and other organizations. It promotes better corporate governance and stewardship activities with the aim of advancing efficient markets and sustainable economies. GPIF joined ICGN in August 2019.



ICGN
International Corporate Governance Network

August
2019**Joined CII**

The Council of Institutional Investors (CII) is a network of institutional investors established by U.S. public pension funds, with the aim of advocating and collaborating in the areas of shareholder rights and corporate governance in the U.S. GPIF joined CII in August 2019.



Council of Institutional Investors®
The voice of corporate governance

Column**GPIF named as a Leader in “Responsible Asset Allocator” list**

GPIF was named by American think tank, New America, as a Leader in the 2021 Leaders List of “The 30 Most Responsible Asset Allocators.” Every two years, New America analyzes sovereign wealth funds and pension funds on their responsible investing practices, ranging widely from information disclosure to ESG integration, based on the Responsible Asset Allocator Initiative (RAAI) index, developed in partnership with the Fletcher School at Tufts University.

In 2021, GPIF was included in the Leaders List, which ranks the top 30 Responsible Asset Allocators, alongside the Norway Government Pension Fund Global, APG Group of the Netherlands, and California State Teachers' Retirement System (CalSTRS) in the United States. We were the only Asian pension fund to be selected as a Leader in 2021. This is GPIF's second consecutive inclusion in the Leaders List, after being named in 2019.



Column

Investor Attention to “Human Capital” and Its Disclosure

Challenges in Human Capital-Related Disclosure

The skills and abilities required of workers are changing rapidly due to changes in the industrial structure and the advancement of digital transformation (DX). In seeking to improve their corporate value, companies need to identify gaps in the skills and abilities of their people, coordinate their people strategies with management strategies, and explain them to investors. At present, corporate disclosures of human capital information are inadequate.

According to a questionnaire survey¹ of companies about human capital published by Recruit Co., Ltd. in December 2021, while around 65% of all companies collect (measure) information on human capital, only around 15% of them disclose it externally. In a correlation analysis of ESG ratings among ESG rating agencies, which GPIF has conducted since 2017, the correlation of the S metric has stayed low among Japanese companies in particular (Please refer to page 46 for details). This may be due to factors such as the difference in rating methodologies by the individual ESG rating agencies, confusion among companies regarding which disclosure standards to follow given the many standards available, and difficulties faced by investors in making comparisons of ESG ratings by the same standards, as well as insufficient information disclosure by companies.

According to the KPMG Japan CFO Survey 2021², human capital was the sustainability issue most cited by CFOs as having an impact on corporate value. In this survey, several issues such as “selecting sustainability-related metrics to be monitored and setting goals,” “connecting sustainability measures with corporate value creation,” and “establishing processes and systems for collecting necessary non-financial information” were identified as challenges in preparing comprehensive sustainability reports. This suggests that, although companies recognize the importance of human capital, they are not yet making full use of human resources data and other relevant data. The Ministry of Economy, Trade and Industry's Ito Report on Human Capital³ recommends that companies' executive teams, including the CEO and CHRO (Chief Human Resource Officer), should formulate and implement a people strategy that coordinates with management strategy. It is hoped that executive teams will facilitate the collection and maintenance of human resources data across divisions and promote corporate information disclosure.

Global Trends in the Development of Human Capital Disclosure Standards

Various organizations around the world are engaged in the development of disclosure standards for human capital information (Figure 1). The U.S. Securities and Exchange Commission (SEC) and the European Commission (EC) are also working to institutionalize information disclosure frameworks. This progress in the development and institutionalization of various human capital disclosure standards could be described

as a move to reflect the demands of diverse stakeholders, given the growing requirements for information disclosure on a global scale. As there are multiple disclosure standards available and disclosure themes vary from standard to standard, there have been moves to integrate disclosure standards. We believe that the need for standardization of disclosures will continue to increase in the future.

¹ *Human Resources Survey on Human Capital Management and Human Resource Management (2021): Vol.1 Survey on 11 Major Areas Based on ISO 30414*, Recruit Co., Ltd.

² *KPMG Japan CFO Survey 2021*, KPMG Japan

³ *Report of the Study Group on Improvement of Sustainable Corporate Value and Human Capital (Ito Report on Human Capital)*, Ministry of Economy, Trade and Industry

⁴ JTUC Research Institute for Advancement of Living Standards/QUICK Corp ESG Research Center Research Committee on ESG-S Indexes

⁵ *Study Group on Non-financial Information Disclosure Guidelines*, Ministry of Economy, Trade and Industry

Figure 1. International Human Capital Disclosure Standards Frameworks

	Organization	Description
Voluntary framework	International Integrated Reporting Council (IIRC)	<p><u>IIRC Framework</u></p> <ul style="list-style-type: none"> Positions human capital as one of six types of capital (financial capital, manufacturing capital, intellectual capital, human capital, social and related capital, and natural capital) and illustrates as a framework that it is a source and outcome of corporate value creation. Specific disclosure items are not defined.
	Sustainability Accounting Standards Board (SASB)	<p><u>SASB Standards</u></p> <ul style="list-style-type: none"> Sets specific disclosure themes and metrics by industry for 77 industries. Presents specific questions and rating criteria for each industry from three perspectives: fair labor practices; employee health, safety, and wellbeing; and employee engagement, diversity and inclusion.
	Global Reporting Initiative (GRI)	<p><u>GRI Standards</u></p> <ul style="list-style-type: none"> Presents human capital-related disclosure themes in 15 areas, including employment and labor/management relations. Does not require disclosure of all themes and metrics, but requires disclosure of items deemed important by individual reporting organizations.
	World Economic Forum (WEF)	<p><u>Stakeholder Capitalism Metrics</u></p> <ul style="list-style-type: none"> Recommends disclosure of human capital-related indicators such as diversity, pay gap, and health and well-being to reflect the fairness of companies and their treatment of employees. Also recommends disclosure of themes deemed important to companies' own businesses and stakeholders in a flexible manner.
	International Organization for Standardization (ISO)	<p><u>ISO 30414</u></p> <ul style="list-style-type: none"> Sets 11 disclosure themes related to human resources including compliance, diversity, and skills and abilities.
Institutional	Securities and Exchange Commission (SEC)	<p><u>Regulation S-K</u></p> <ul style="list-style-type: none"> Disclosure of number of employees is mandatory. If more specific information on human capital is important for understanding the business, information on the number of full-time, part-time, seasonal, and temporary workers, as well as turnover rates, must also be disclosed.
	European Commission (EC)	<p><u>Non-Financial Reporting Directive</u></p> <ul style="list-style-type: none"> With respect to human capital, recommends that elimination of sex discrimination, equal opportunities, and occupational health and safety matters be disclosed under Society/Employee themes. Non-binding guidelines as well as existing standards such as SASB and GRI, are allowed for use in disclosures.

(Source) Prepared by GPIF based on the Working Group on Corporate Disclosure of the Financial System Council, Financial Services Agency, and the Study Group on Visualizing Non-financial Information, Cabinet Secretariat.

Trends and Moves on the Development of Information Disclosure Guidelines on Human Capital in Japan

Human capital is also attracting growing attention in Japan. The 2020 Ito Report on Human Capital recommends that companies should engage in dialogue with investors regarding people strategies that will lead to the enhancement of corporate value over the medium to long term, based on communications from and visualization of companies. Japan's Corporate Governance Code, which was revised in 2021, includes new items related to human capital disclosures, and companies are required to disclose the information. In 2022, an Ito Report on Human Capital 2.0 gave proposals for how companies could embody their people strategies and implement them.

In Japan, while there is no comprehensive framework for human capital, awards and recognition systems focusing on specific areas such as health and women's empowerment have been actively implemented for some time. The Ministry of Economy, Trade and Industry and the Tokyo Stock Exchange jointly select companies that encourage women's success in the workplace as "Nadeshiko Brands," while the Ministry of Economy, Trade and Industry names companies with outstanding health

and productivity management in its "Health & Productivity Stock Selection." The Ministry of Health, Labour and Welfare's "Kurumin certification" is another example. A Research Committee⁴ established in 2020 by the JTUC Research Institute for Advancement of Living Standards and QUICK Corp ESG Research Center has been examining metrics that reflect Japan's characteristic employment practices, which depend on non-regular workers, on the assumption that "labor" issues in particular have regional characteristics.

As human capital is characterized by many and varied issues, there are moves emerging to organize those issues for disclosure purposes. In November 2021, a study group⁵ at the Ministry of Economy, Trade and Industry organized the issue into 19 items, by examining disclosure from the two perspectives: disclosure from "value enhancement," which leads to the enhancement of corporate value over the medium to long term, and disclosure from "risk management," which responds to the need for risk assessment. The study group also examined the optimal balance between ensuring the objectivity and comparability of disclosed information and

demonstration of originality. A study on people strategies coordinated with management strategies commissioned by the Ministry of Economy, Trade and Industry in March 2021 examined the relationship between the 19 disclosure items mentioned above and global disclosure standards, as well as the extent to which they cover global standards. (Figure 2)

According to the research, the disclosure items differ greatly depending on the global disclosure standards. For example, items such as development, diversity, safety, and physical health are set in all disclosure standards. It could be said that many of these items are easy to quantify and compare between companies. On the other hand, none of the disclosure standards include skills/experience and engagement in their disclosure items, and only ISO includes the leadership and succession in its disclosure standards. These items are difficult to quantify, and many of them appear to require originality in disclosure by companies. Boilerplate information disclosure would be given little or no attention from the market, so it is important for companies to keep in mind what purpose they are making in disclosures.

The establishment of a Study Group⁶ in the Cabinet Secretariat in February 2022 is a major move toward organizing the issues related to

human capital disclosure. This Study Group is developing guidelines for human capital visualization to deepen mutual understanding between management, investors, and employees. It is envisaged that these guidelines will serve as a comprehensively organized manual for reporting, providing directions, including how to use of existing global disclosure standards, with a focus on the whole concept of information disclosure. According to a Financial Services Agency report released in June 2022, certain items are considered to be included in disclosures in financial reports, such as human resources development policies, working environment improvement policies, the ratio of female managers, the rate of male employees taking childcare leave, and the gender pay gap. This would suggest a move toward mandatory disclosure of these items.

The development of guidelines on human capital and moves to make information disclosure of certain items mandatory could be seen as major steps to advance information disclosure. On the other hand, the process of integrating disclosure standards has only just begun, and the question of how to evaluate unique disclosures that are difficult to compare with other companies is one for future consideration.

Figure 2. Relationship Between 19 Human Capital-related Disclosure Themes and Global Disclosure Standards

Disclosure Theme	SASB	GRI	WEF	ISO
Leadership				○
Development	○	○	○	○
Skills/Experience				
Engagement				
Recruitment	○	○		○
Retention	○	○		○
Succession				○
Diversity	○	○	○	○
Non-discrimination	○	○	○	
Childcare Leave		○		
Safety	○	○	○	○
Physical Health	○	○	○	○
Mental Health	○	○		○
Labor Practices	○			
Child/Forced Labor	○	○	○	
Pay Equality	○	○	○	
Welfare and Benefits	○			
Relationship with Unions	○			
Compliance		○		○

(Note) IIRC is not included in this table as it does not set specific disclosure items.

(Source) Prepared by GPIF based on the Study Group on Non-financial Information Disclosure Guidelines, Ministry of Economy, Trade and Industry (METI), and research on people strategies coordinated with management strategies commissioned by METI in March 2021

⁶ Study Group on Visualizing Non-financial Information, Cabinet Secretariat



Review of ESG Activities and Future Outlook

GPIF's Investment Principles state that “sustainable growth of investee companies and the capital market as a whole are vital in enhancing long-term investment returns.” Sustainable growth of our investments and the market as a whole could never be achieved by GPIF alone. GPIF will pursue ESG-based investment from the perspective of securing long-term investment returns with the cooperation of all concerned parties.

In fiscal 2021, the capital market was buffeted severely, particularly in the second half of the fiscal year, by several factors, including concerns over tightening monetary policy by the U.S. Federal Reserve Bank and Russia's invasion of Ukraine. The ESG investment sector was similarly affected, with many news reports that ESG funds, which had avoided investing in energy and munitions stocks and instead focused on growth stocks, were facing difficulties due to sudden changes in the market environment.

Even under such difficult circumstances, we believe that GPIF's ESG investments were able to achieve relatively stable results in fiscal 2021 (Please refer to pages 41-42 for details). In passive investments based on ESG indexes, although there will be tracking errors (relative return fluctuations) against the benchmark TOPIX and MSCI ACWI ex Japan indexes in the short term, we aim to reduce future ESG risks to improve returns and reduce investment risks in the long term by taking that risk. In other words, proper management of both short-term and long-term risks is critical in ESG investments, and ESG investments themselves will not be sustainable without taking short-term risks into account.



With this awareness of the issue, in fiscal 2021 GPIF adopted the FTSE Blossom Japan Sector Relative Index with the aim of curbing ESG risks while managing industry risks, and engaged with index providers to improve ESG indexes. We also selected Sumitomo Mitsui Trust Asset Management Co., Ltd. and Resona Asset Management Co., Ltd. as engagement-enhanced passive managers, joining the two firms previously selected. In our engagement-enhanced passive management by these four asset managers, from the perspective of investment performance with TOPIX as our benchmark, we aim for the sustainable growth of the market as a whole and the earning capacity of investee companies, without taking the misfit risk from TOPIX.

It is impossible to know from outside whether changes in corporate behavior after engagement with our asset managers are due to the effectiveness of that engagement, whether they are the result of engagement with other asset managers, or, indeed, whether they are spontaneous changes on the part of the companies themselves. Moreover, in engagement aimed at boosting the market, because the very market benchmarks that serve as a yardstick for assessment will change, regular assessment methods cannot be used. As described here, although we recognize the extreme difficulty of measuring the effectiveness of engagement, such measurement is unavoidable if we are to implement the PDCA cycle on stewardship-type engagement appropriately. We intend to take on the challenge of this difficult task with the cooperation of our external asset managers, academia, and other relevant parties.

As stated in our Investment Principles, GPIF believes that sustainable growth of investee companies and the capital market as a whole are vital in enhancing long-term investment returns. This is not something that we could ever hope to achieve without the cooperation of our external asset managers, index providers, and ESG rating agencies. GPIF will pursue ESG investment from the perspective of securing long-term investment returns with the cooperation of all concerned parties.

Executive Managing Director and Chief Investment Officer (CIO)
UEDA Eiji

ESG Index Performance

The ESG indexes selected by GPIF generally outperformed market averages over the five years since we started ESG index-based passive investments in fiscal 2017 until fiscal 2021. We have also confirmed the improvement of risk-adjusted return (Sharpe Ratio) and the reduction of portfolio ESG risks. We will continue to review ESG index performance from long-term perspectives.

ESG Index Performance Attribution Analysis

Figure 1 shows the performance of GPIF's selected ESG indexes from April 2017 to March 2022 and during the previous year from April 2021 to March 2022. Over the past five years, these indexes generally outperformed both their parent indexes and market averages (TOPIX for Japanese equities and MSCI ACWI (excluding Japan) for foreign equities).

GPIF believes that in the case of ESG investments, the longer the investment period, the better the improvement in risk-adjusted returns. As part of this review, in addition to the evaluation of returns in Figure 1, Figures 2 and 3 show a review of performance taking risks into account, and Figure 4 shows a review with the addition of the portfolio's ESG rating. The review described below only covers domestic equity ESG indexes, due to the short investment periods of foreign equity ESG indexes.

Figure 2 shows the difference between the risk (standard deviation of return) of each index for five periods (1, 2, 3, 4, and 5 years) from April 2017 to the end of each fiscal year and the relative risk compared to TOPIX in the corresponding periods. A positive (negative) difference indicates a higher (lower) risk than the TOPIX. From the one-year to three-year periods starting in April 2017, the risks of each index generally followed a downward trend compared with the TOPIX, and in subsequent periods, positive differences stayed flat or below those levels.

Figure 3 shows the difference between the Sharpe

Ratio for the TOPIX and the Sharpe Ratio for each index based on the calculation of risks and returns in the same five periods as those used in Figure 2. A positive (negative) difference indicates a higher (lower) Sharpe Ratio than TOPIX. The Sharpe Ratio, which is widely used as an indicator of risk-adjusted returns, is the ratio of portfolio return rates divided by the portfolio risk. The higher the value, the more efficient the portfolio. For each ESG index, Sharpe Ratios for the one-year period from April 2017 to March 2018 were generally lower than the TOPIX, but for the two-year to five-year periods, it has remained generally higher than the TOPIX. This indicates a high level of investment efficiency of our portfolio.

Figure 4 shows the relationship between the Sharpe Ratio in Figure 3 and ESG Ratings. We have confirmed that ESG indexes have higher ESG ratings than the TOPIX, and that their Sharpe Ratio applying risk and return for the past five years also tend to be higher. This result suggests that these ESG indexes have both improved their Sharpe Ratio and reduced their portfolio ESG risks over the past five years, from April 2017 to March 2022.

These results only cover certain indexes over a just five year period. We believe that the impact of portfolio ESG ratings on risk-adjusted returns requires further examination over the long term. GPIF will continue to examine the performance of ESG indexes from various angles, without being swayed by short-term investment results.

Figure 1. Returns of Eight ESG Indexes Selected by GPIF

	April 2017 to March 2022 (past 5 years, annualized)					(Reference) April 2021 to March 2022				
	Return Rates			Excess Return		Return Rates			Excess Return	
	(a)	(b)	(c)	(a-b)	(a-c)	(a)	(b)	(c)	(a-b)	(a-c)
	ESG Index	Parent Index	TOPIX	Parent Index	TOPIX	ESG Index	Parent Index	TOPIX	Parent Index	TOPIX
(1) MSCI ESG Select Leaders	9.00%	8.03%	7.62%	0.96%	1.38%	3.64%	2.32%	1.99%	1.32%	1.66%
(2) MSCI WIN	8.03%	8.03%		-0.01%	0.41%	0.87%	2.32%		-1.45%	-1.12%
(3) FTSE Blossom	8.86%	8.03%		0.83%	1.24%	5.72%	2.08%		3.64%	3.73%
(4) FTSE BlossomSR	8.80%	7.85%		0.95%	1.18%	4.53%	2.08%		2.45%	2.54%
(5) S&P/JPX Carbon	7.75%	7.62%		0.13%	0.13%	2.02%	1.99%		0.03%	0.03%
	ESG Index	Parent Index	MSCI ACWI ex Japan	Parent Index	MSCI ACWI ex Japan	ESG Index	Parent Index	MSCI ACWI ex Japan	Parent Index	MSCI ACWI ex Japan
(6) S&P Global Carbon	14.58%	14.53%	14.55%	0.05%	0.03%	20.13%	19.12%	19.38%	1.01%	0.75%
(7) MSCI ESG Universal	15.04%	14.45%		0.59%	0.48%	19.72%	19.40%		0.32%	0.34%
(8) Morningstar GenDi	15.51%	15.40%		0.10%	0.95%	22.13%	22.20%		-0.07%	2.75%

(Note1) Index returns include dividends. The periods used to calculate index return rates and risks differ from the terms of GPIF's actual investments.

(Note2) The parent indexes for (1) to (8) (constituent universe) are as follows:

(1)(2) MSCI JAPAN IMI TOP700

(5) TOPIX

(7) MSCI ACWI ex Japan ex China A ESG Universal with Special Taxes Index

(Source) Prepared by GPIF based on data from FactSet.

(3)(4) FTSE JAPAN ALL CAP

(6) S&P Global Ex-Japan LargeMidCap

(8) Morningstar® Developed Markets Ex-Japan Large-Mid

Figure 2. Difference in Risk of ESG Indexes for Domestic Equities (vs. TOPIX)

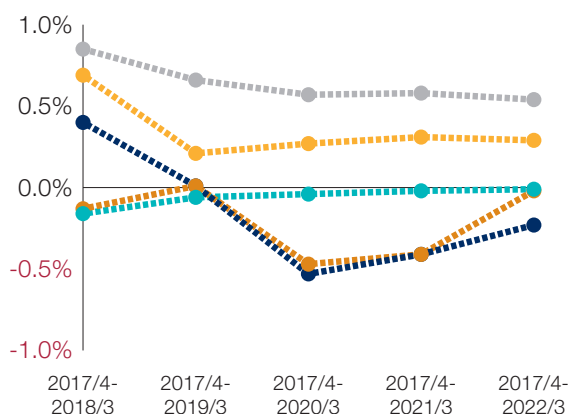
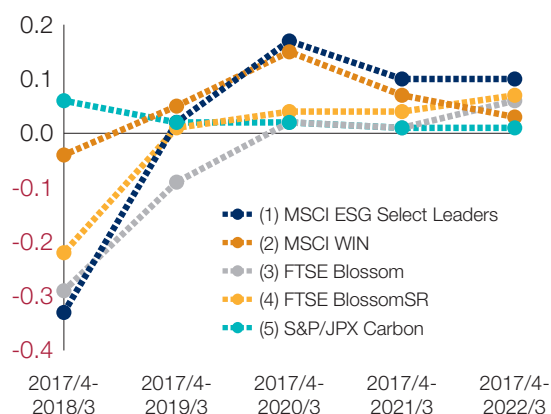


Figure 3. Difference in Sharpe Ratio of ESG Indexes for Domestic Equities (vs. TOPIX)



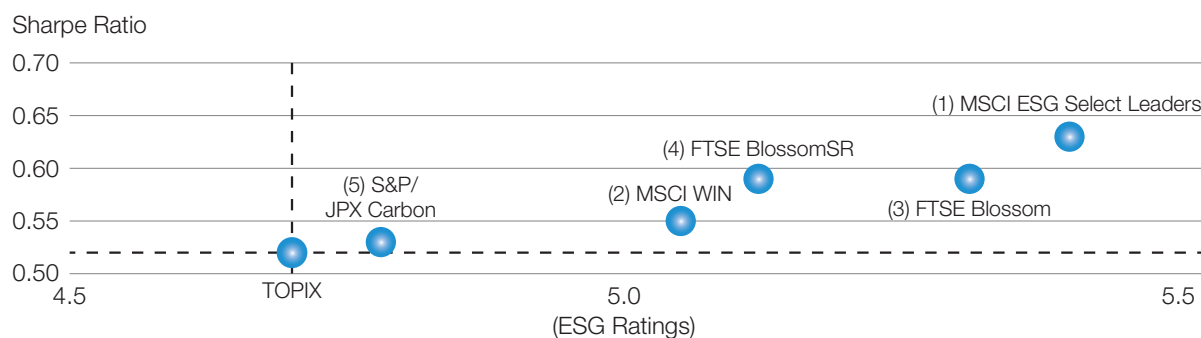
(Note 1) The horizontal axes in Figures 2 and 3 show the risk and Sharpe Ratio from April 2017 to the end of each fiscal year. For example, "2017/4-2022/3" indicates the risks and Sharpe Ratio for the five years from April 2017 to March 2022.

(Note 2) Figure 2 shows the difference between the risk (annualized) from April 2017 to the end of each fiscal year calculated for each index and TOPIX.

(Note 3) Figure 3 shows the difference between the Sharpe Ratio (annualized) from April 2017 to the end of each fiscal year calculated for each index and TOPIX.

(Source) Prepared by GPIF based on data from FactSet.

Figure 4. Relationship Between ESG Ratings and Sharpe Ratio for Domestic Equity ESG indexes and TOPIX



(Note 1) ESG ratings are based on data as of the end of March 2022. Sharpe Ratios are from April 2017 to March 2022 (annualized).

(Note 2) ESG ratings are the average of FTSE and MSCI (Please refer to pages 43-44 for the calculation of portfolio ESG rating).

(Source) Prepared by GPIF based on data from FTSE and MSCI.

FTSE Russell. Reproduced by permission of MSCI ESG Research LLC ©2022.

Portfolio ESG Rating

GPIF invests in a broad range of equity in Japan and overseas through external asset managers. In this year's report, we once again measured the ESG rating of our equity portfolios. Results confirmed that the portfolio ESG rating generally continued to improve for both domestic and foreign equities, despite some impact from methodology changes at FTSE.

Analysis of Portfolio ESG Rating

GPIF invests in a broad range of equity in Japan and overseas through external asset managers, about 2,347 companies in our domestic equity portfolio and 3,573 companies in our foreign equity portfolio. Similar to last year, we measured the ESG rating of our equity portfolios in this year's report.

We calculated the weighted average ESG score, E score, S score, and G score for our portfolio based on ESG ratings from both FTSE and MSCI (excluding stocks for which an ESG rating was not available). The overall ESG rating, weighted by market capitalization, represents the sum of the E, S, and G ratings. (MSCI ratings include an industry adjustment factor.)

Figures 1 to 4 show the trend in each ESG rating for GPIF's equity portfolios every year from March 31, 2017 to March 31, 2022, as well as the ESG rating for market representative indexes as of March 31, 2022. In the FTSE evaluation, the ESG rating for domestic equities increased, but there was a fall in the rating for foreign equities. On the other hand, the MSCI ESG rating continued to improve for both domestic and foreign equities, with relatively large increases confirmed in the most recent year in particular.

In the FTSE evaluation, the ESG rating for foreign equities showed a decline, but we believe this to be the result of changes in FTSE's methodology, specifically, its use

of the TPI Management Quality Score (please refer to page 65-66 for details). This Score evaluates attitude of companies' management toward climate change risks and opportunities, when they rate the Climate Change theme in the E category, which resulted in a harsher evaluation and consequent fall in ratings for that category. Similar to foreign equities, the E rating of domestic equities also declined.

Figures 5 and 6 show trends over time in each of the E, S, and G ratings for GPIF's equity portfolios from March 2017. In the FTSE evaluation, a difference between regions was observed, with both S and G ratings increasing in the most recent year for domestic equities, while for foreign equities, the S rating increased and the G rating fell. In the MSCI evaluation, the E, S, and G ratings for both domestic and foreign equities increased in the most recent year.

We compared the ESG ratings for GPIF's equity portfolios to ratings for the whole market (TOPIX and MSCI ACWI (excluding Japan)) by using the same methodology to calculate the ESG ratings for the index constituents as of March 31, 2022. The result shows that GPIF's equity portfolios are outperforming the ESG scores for the TOPIX and MSCI ACWI (excluding Japan), albeit marginally (Figures 1 to 4). This result is likely due to the adoption of ESG Indexes and Carbon Efficient Indexes.

Figure 1. FTSE ESG Ratings (Domestic Equities)

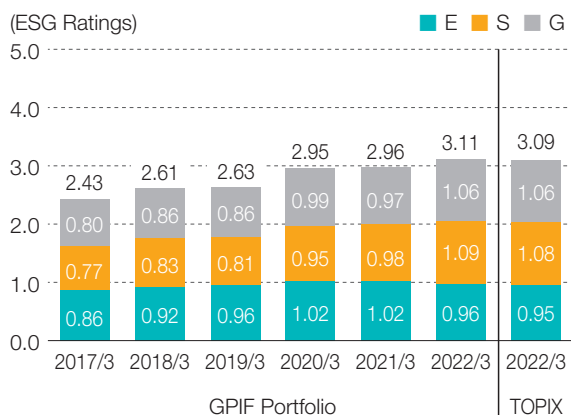


Figure 2. FTSE ESG Ratings (Foreign Equities)

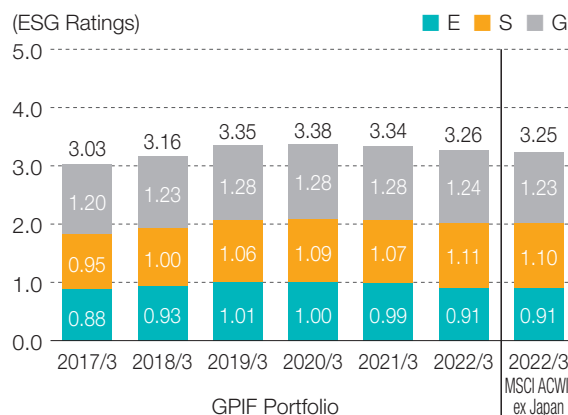


Figure 3. MSCI ESG Ratings (Domestic Equities)

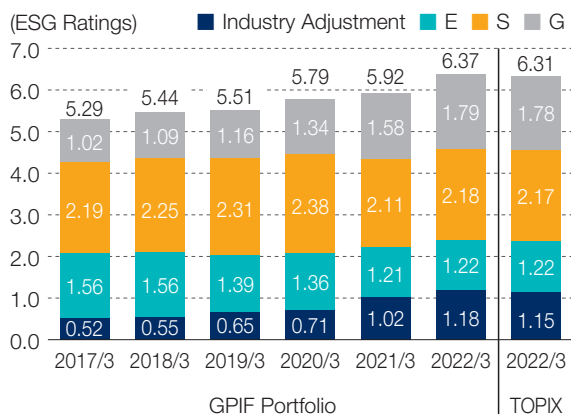


Figure 4. MSCI ESG Ratings (Foreign Equities)

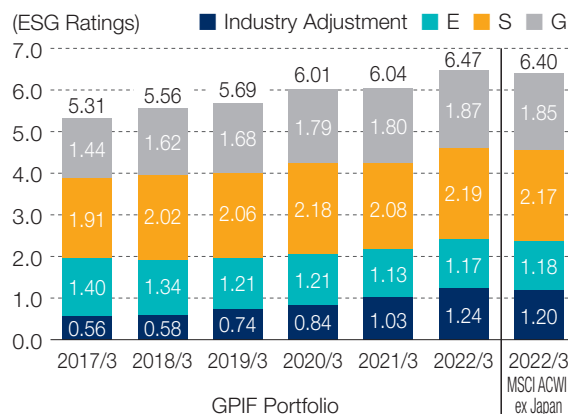


Figure 5. FTSE ESG Ratings for Each Category

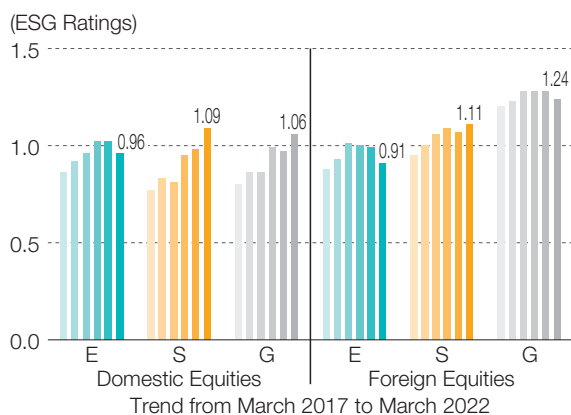
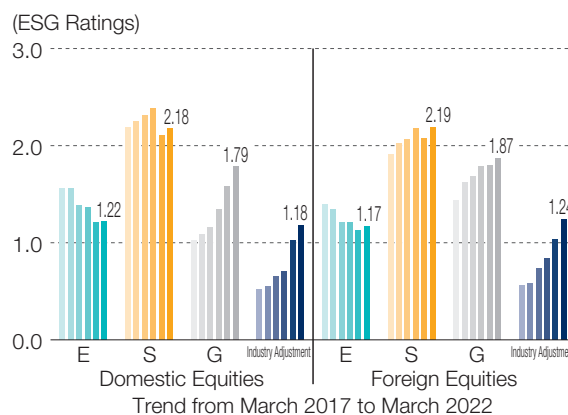


Figure 6. MSCI ESG Ratings for Each Category



Figures 1, 2, and 5 (Note) GPIF holdings: Among the stocks held by GPIF, we analyzed those with ESG ratings by FTSE.

(Source) Prepared by GPIF based on data from FTSE. FTSE Russell.

Figures 3, 4, and 6 (Note 1) GPIF holdings: Among the stocks held by GPIF, we analyzed those with ESG ratings from MSCI.

(Note 2) Industry adjustment: Difference between the final rating and the weighted average of each company's rating for environmental (E), social (S) and governance (G), arising due to the normalization of ratings by industry.

(Source) Prepared by GPIF based on data from MSCI. Reproduced by permission of MSCI ESG Research LLC ©2022.

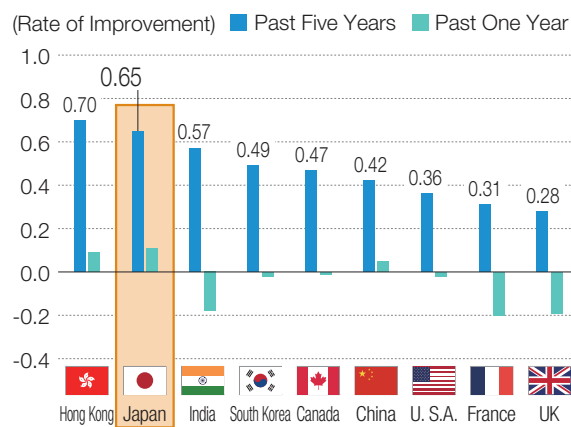
ESG Rating Ranking by Country

ESG Rating Ranking by Country

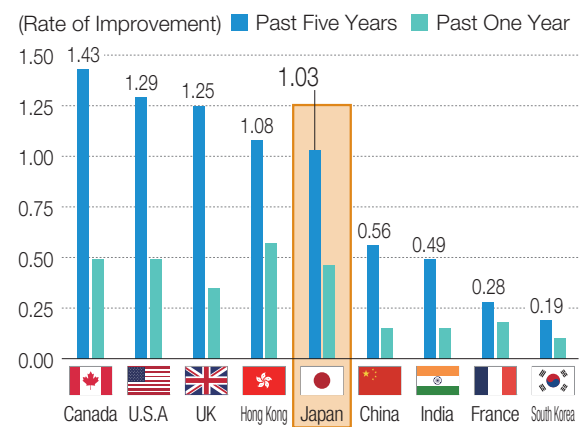
FTSE						
March 2017	March 2018	March 2019	March 2020	March 2021	March 2022	Latest Value
France	France	France	France	France	France	3.70
UK	UK	UK	UK	UK	UK	3.56
Canada	Canada	Canada	Canada	Canada	Canada	3.18
USA	USA	USA	India	India	USA	2.89
India	India	India	USA	USA	India	2.88
Japan	Japan	South Korea	South Korea	Japan	Japan	2.65
South Korea	South Korea	Japan	Japan	South Korea	South Korea	2.63
South Korea	South Korea	South Korea	South Korea	South Korea	South Korea	2.31
China	China	China	China	China	China	1.57

MSCI						
March 2017	March 2018	March 2019	March 2020	March 2021	March 2022	Latest Value
France	France	France	France	UK	UK	7.85
UK	UK	UK	UK	France	France	7.35
Canada	Canada	Canada	Canada	Canada	Canada	6.56
Japan	Japan	Japan	Japan	Japan	Japan	6.15
USA	USA	USA	USA	USA	USA	5.85
South Korea	India	South Korea	India	South Korea	South Korea	4.81
India	South Korea	India	South Korea	India	India	4.34
South Korea	South Korea	South Korea	South Korea	South Korea	South Korea	4.16
China	China	China	China	China	China	3.00

Rate of Improvement in FTSE ESG Ratings by Country

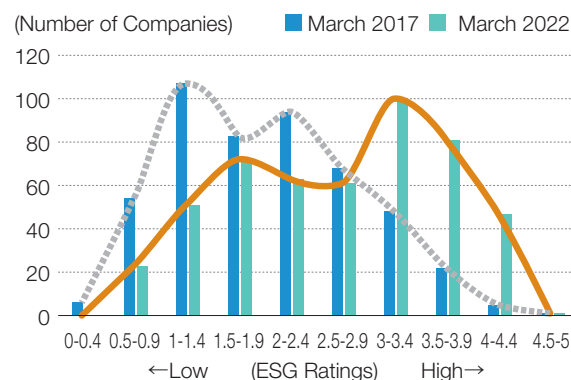


Rate of Improvement in MSCI ESG Ratings by Country

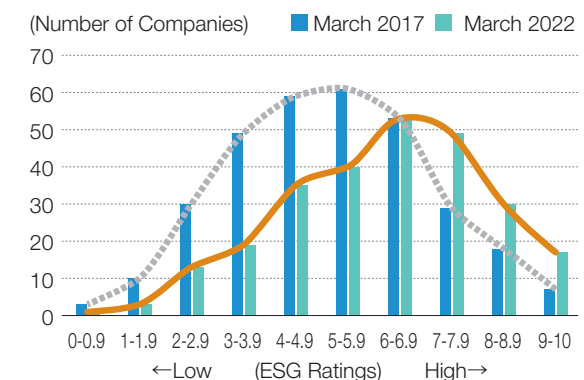


(Note) This figure shows the change over the five years from the end of March 2017 to the end of March 2022 and over the most recent year.

FTSE ESG Rating Distribution for Japanese Companies



MSCI ESG Rating Distribution for Japanese Companies



(Note) Among the companies included in FTSE's "FTSE All World Index" and MSCI's "MSCI All Country World Index," the analysis focused on those that had an ESG rating. (Source) Prepared by GPIF based on data from FTSE and MSCI. FTSE Russell. Reproduced by permission of MSCI ESG Research LLC ©2022.

Correlation of ESG Ratings

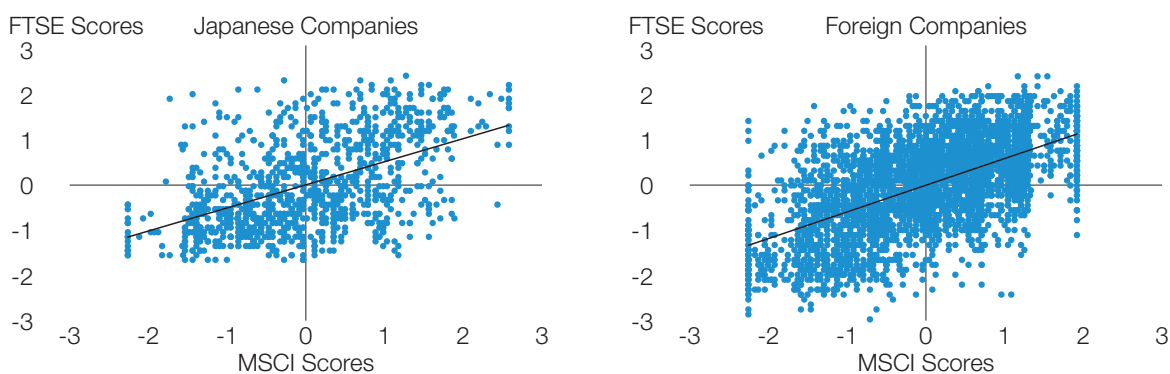
Unlike financial analysis, there are no established standard methodologies for the evaluation of non-financial information, so that ESG ratings by rating agencies vary from agency to agency. Correlation among ESG ratings is gradually increasing for both Japanese and foreign companies.

Correlation Analysis among ESG Ratings

As ESG ratings deal with a diverse variety of non-financial information, unlike financial analysis, there are no established standard rating methodologies as yet. For this reason, there is considerable variation among ESG ratings by rating agencies. Nevertheless, GPIF believes that the evaluation of companies' ESG ratings should be done in more appropriate ways, by improving rating methodologies, enhancing information disclosure, and standardizing disclosure criteria. As a reference point to ascertain the current situation, we monitor the ESG rating correlation between FTSE and MSCI every year, dividing ESG ratings into four categories; ESG score, E score, S score, and G score.

The scatter diagram in Figure 1 shows the ESG scores of the two rating agencies for the same target companies as of March 31, 2022, with the ESG scores by FTSE on the vertical axis and those by MSCI on the horizontal axis. A certain degree of positive correlation was confirmed for both Japanese and foreign companies. Figure 2 shows the changes in correlation of ESG scores, E scores, S scores, and G scores in chronological order as of March 31 every year from 2017 to 2022. These results indicate that the correlation of the individual scores, especially for ESG score, is gradually increasing for both Japanese and foreign companies.

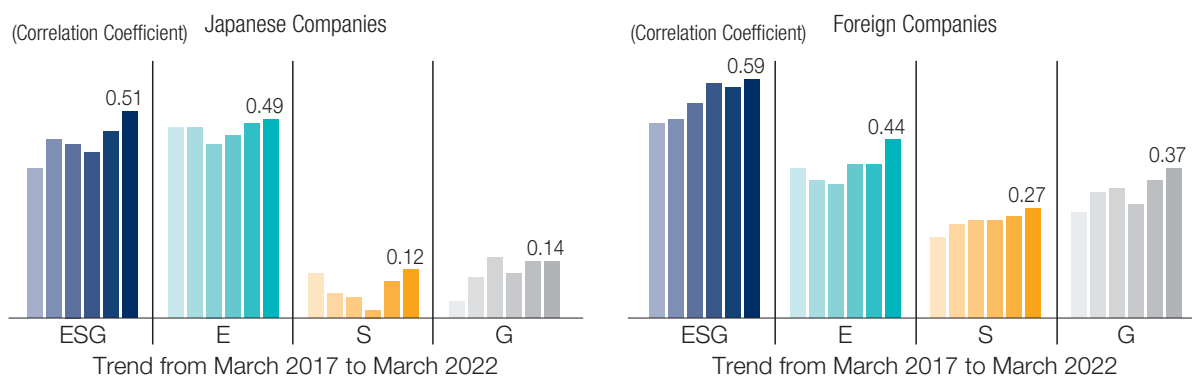
Figure 1. FTSE and MSCI ESG Score Correlation Chart (as of March 31, 2022)



(Note) Normalized (mean 0, variance 1) and plotted ESG rating data from FTSE and MSCI.

(Source) Prepared by GPIF based on data from FTSE and MSCI. FTSE Russell. Reproduced by permission of MSCI ESG Research LLC ©2022.

Figure 2. Trends in Correlation Coefficient of ESG Score Data from FTSE and MSCI



(Source) Prepared by GPIF based on data from FTSE and MSCI. FTSE Russell. Reproduced by permission of MSCI ESG Research LLC ©2022.

Gender Diversity in Japanese Companies

Gender diversity is a central element of the S (Social) category in ESG. This is a major issue for Japanese companies, but at the same time, it is an area with tremendous potential for improvement. In this section, we provide an overview of the current status of Japanese companies through a comparison with foreign companies and consider their challenges.

Gender Diversity in Japanese Companies

GPIF adopted the MSCI Japan Empowering Women Index (WIN) in 2017 and the Morningstar Gender Diversity Index (GenDi) in 2020 as passive equity benchmarks. In December 2019, GPIF joined the 30% Club Japan Investor Group, a group that aims to increase the ratio of female executives in Japanese companies. A large body of evidence shows that companies with greater gender diversity are able to access a wider pool of talent, which can potentially improve management performance. From a macro-economic perspective as well, higher gender diversity has the potential to boost the economic performance of individual countries. Based on this understanding, by investing in companies with greater gender diversity, GPIF aims to increase long-term

investment returns caused by the sustainable growth of our investees and the market as a whole.

Similar to last year, we reviewed data of the quantitative score items used in the WIN index to gauge progress in gender diversity at Japanese companies as shown below.

The percentage of women for each criterion (median) is between 10% and 29% in the items (1) (2) (4) and (5), suggesting women remain in the minority for each criterion. On the other hand, looking at the trend over the past six years, (2) % Women in Workforce, (4) % Women in Senior Management, and (5) % Women on Board, are trending upward. (Figure 1)

Figure 1. Actual Values for WIN Index Quantitative Score Items (Median)

	2017	2018	2019	2020	2021	2022
(1) % Female New Hires	25.0%	27.9%	28.0%	28.9%	28.1%	27.0%
(2) % Women in the Workforce	17.0%	18.6%	18.8%	20.2%	21.2%	22.0%
(3) Difference in years men and women are employed by the company	-16.6%	-16.5%	-16.5%	-17.5%	-18.2%	-17.9%
(4) % Women in Senior Management	3.5%	4.5%	4.6%	5.1%	5.5%	6.0%
(5) % Women on Board*	10.0%	10.0%	10.0%	11.1%	12.5%	12.5%
Rate of Disclosure for (1) to (5)	73.6%	72.7%	77.3%	75.4%	74.0%	76.8%
Reference: % Companies with Female Directors	40%	42%	52%	61%	72%	83%

(Note) Includes companies evaluated in the WIN index (500 major companies up to 2019, and 700 major companies from 2020).

*% Women on Board is calculated excluding the value of 0%.

(Source) Prepared by GPIF based on data from MSCI. Reproduced by permission of MSCI ESG Research LLC@2022.

Advancement of Women into Executive Positions Remains a Challenge

Continuing from last year, we examined the standardized scores for Japanese companies for each of the 19 criteria included in Equileap's scoring methodology (the "Score") used in the GenDi Index to verify which areas had particular

room for improvement (Figure 2). The Score is used to evaluate the companies in question from 0 to 100 points in each of four categories.

While Japanese companies rank highly globally in terms

of “parental leave” and “flexible work style options,” they still lag significantly behind the global standard in terms of the gender balance of boards of directors, executive positions and senior management. Moreover, that gap has increased since the previous year. For this reason, the gender balance of directors and executives is one of the major theme in institutional

investors’ engagement. Some asset managers have a policy of opposing proposals for the appointment of top management if there are no women on the board. At the same time, in order to improve the gender balance of boards of directors, it will be essential for the company to boost the gender balance in companies’ workforce and senior management.

Figure 2. Individual Criteria of Average Gender Scorecard and Standardized Scores of Japanese Companies for Each Criterion

Area	Criterion	Standardized Score	Change from previous year
A. GENDER BALANCE IN LEADERSHIP & WORKFORCE	1 Board of Directors	30.5	0.0
	2 Executives	27.1	-2.7
	3 Senior Management	29.5	-3.3
	4 Workforce	38.5	-5.2
	5 Promotion & Career Development Opportunities	33.0	-4.6
B. EQUAL COMPENSATION & WORK LIFE BALANCE	6 Living Wage	47.6	0.6
	7 Gender Pay Gap	43.9	-0.4
	8 Parental Leave	63.9	-1.0
	9 Flexible Work Style Options	61.5	1.4
C. POLICIES PROMOTING GENDER EQUALITY	10 Training and Career Development	50.7	-2.4
	11 Recruitment Strategy	29.4	1.2
	12 Freedom from Violence, Abuse and Sexual Harassment	49.5	-1.2
	13 Safety at Work	42.7	-2.6
	14 Human Rights	55.5	-1.4
	15 Social Supply Chain	43.2	-2.4
	16 Supplier Diversity	30.4	1.1
	17 Employee Protection	40.1	1.2
D. COMMITMENT, TRANSPARENCY & ACCOUNTABILITY	18 Commitment to Women's Empowerment	50.1	-1.4
	19 Audit	46.1	0.4

(Note) Standardized scores have been calculated based on the average score for each criterion among companies evaluated from 25 countries. Standardized scores of 40 or lower are shown in red.
(Source) Prepared by GPF based on data from Equileap.

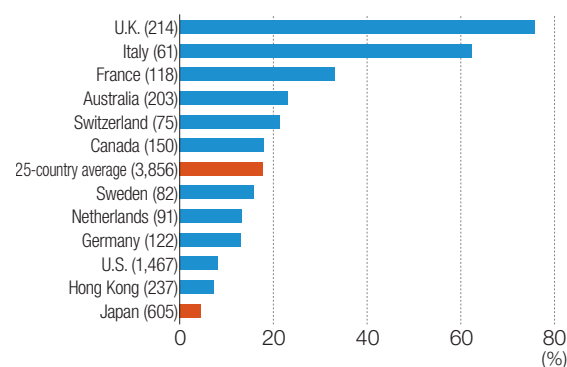
Trends in Gender Pay Gap Disclosure

Under the Priority Policy for Women’s Empowerment and Gender Equality 2022, the Japanese Government announced a policy of making it mandatory for both listed and unlisted companies with over 300 employees to disclose the gender pay gap as a means of encouraging the advancement of women and enhancing corporate value. According to an OECD report on the global gender pay gap¹, 18 of 38 OECD member countries require private-sector companies to disclose their gender pay gaps. The Japanese Government’s announcement is a movement that follows this trend.

GPIF conducted an international comparison of the status of gender pay gap disclosure using the Gender Pay Gap criteria of the Equileap Gender Equality Scorecard. This country-by-country comparison of the disclosure of gender-segregated pay information or pay gaps targets 3,856 companies in 25 developed countries. The result shows a lack of progress even in disclosure in developed countries in the west, with an average of just 17.8% of companies disclosing such information across the 25 countries surveyed. The percentage for Germany was 13.1% and 8.0% for the United States. The rate of Japanese companies that disclose such information was just

4.3%, the lowest among the 25 countries. Compared to other indicators for rating gender diversity, however, there is little difference between Japanese companies and overseas companies in this area. If disclosure of the gender pay gap becomes mandatory in Japan, there is a possibility that Japan could surpass other countries in terms of disclosure rates (Figure 3).

Figure 3. Percentage of Companies that Disclose Gender-Segregated Pay Information or Pay Gap Data



(Note) Disclosure rates are calculated from the number of companies located in the 25 countries that disclose information, based on the Gender Pay Gap indicator of those companies. The graph is an excerpt of countries with 60 or more companies subject to rating among the 25 countries.
(Source) Prepared by GPIF based on data from Equileap.

¹ Pay Transparency Tools to Close the Gender Wage Gap, OECD (2021)

We also conducted an in-depth analysis using detailed information disclosed by companies in the five major countries, namely Japan, the United States, France, Germany, and the U.K. We found that, in the U.K., where it is mandatory for companies of a certain size to publish pay gap information annually, close to 60% of companies not only make these disclosures but also have strategies in place to reduce the gap (Figure 4).

The gender pay gap is an issue common to the entire world. Possible factors behind this gap include low rates of promotion of

women to management positions and the impact of lower wages and fewer promotions for women who have returned to the workforce after temporarily leaving for marriage or childbirth. Pay gaps that have no rational explanation in light of these factors indirectly indicate that companies are failing to provide an environment that allows everyone to flourish in the workplace. For Japanese companies to advance the level of women’s empowerment to other countries, they will need to take mandatory disclosure as an opportunity to recognize the gender pay gap issue and to formulate strategies for improvement.

Figure 4. Status of Disclosure in Five Major Countries Based on Equileap’s Pay Gap Criteria

Pay Gap Criteria		Rate of Disclosure of Companies in Major Countries				
Score	Disclosure Status	Japan	U.S.A.	France	Germany	UK
	Does not have any of the below options	96%	92%	67%	87%	24%
	(a) Has published gender-segregated pay information or an overall gender pay gap	4%	8%	33%	13%	76%
	(b) Has published gender-segregated pay information in at least 3 pay/ occupational bands	1%	1%	6%	2%	2%
	(c) Has a strategy with specific activities to close any gender pay gap	0%	4%	16%	2%	60%
	Discloses both (a) and (c)	0%	2%	8%	1%	59%
	Discloses both (b) and (c)	0%	0%	3%	0%	0%
	(d) Has published verifiable figures showing an overall gender pay gap in the company of less than or equal to 3 percent	0%	0%	0%	1%	4%
	(e) Has published verifiable figures showing the company provides equal pay for equal work in all its bands (must be at least 3 pay/ occupational bands) of less than or equal to 3 percent	0%	0%	0%	0%	0%
	Discloses both (d) and (e)	0%	0%	0%	0%	0%

(Source) Prepared by GPIF based on data from Equileap.

Interview with CEO of Gender Diversity Ratings Agency

Diana van Maasdijk, Co-founder and CEO, Equileap (Interviewed in May 2022)

1 Are there any particular points that companies should be particularly be aware of when disclosing information about gender diversity?

Company disclosures are important because it is a way to guarantee that a company stands behind the issues it is promising or putting in place. Moreover, one can only change what one can measure. We know that we are far from reaching gender equality and balance in the workplace. Accountability starts with transparency. This is why we only accept data that a company publishes itself.

2 Which criteria or metrics of the Gender Equality Scorecard do global investors pay particular attention to, and what are their reasons for that?

There are several criteria which investors are particularly interested in. These include women in senior management positions, the gender pay gap, parental leave policies for women and men, and flexible work options. We believe that these issues are of interest because they show if a company has a glass ceiling (the number of women that reach senior management positions compared to the women in the total workforce) and if a company is committed to a culture that promotes work-life balance and where everyone can thrive irregardless of gender.

Column

Relationship between ESG Information Disclosure and ESG Rating

Although the correlation between ESG ratings is gradually increasing, the level of that correlation is not particularly high. In this column, we present an example of academic research of divergence among ESG ratings and the impact that ESG information disclosure has on the correlation between ESG ratings.

Research on ESG Rating Divergence

GPIF has been monitoring the ESG rating correlations between FTSE and MSCI every year since it first adopted ESG indexes in 2017. In terms of the correlation between total ESG scores, we have confirmed that the scores for both Japanese and overseas companies generally continue to rise, but the correlation coefficient has remained at just over 0.5 (Please refer to page 46 for details). It has been pointed out that different ESG rating agencies give different ESG ratings for the same companies, mainly due to differences in their rating methodologies. Research on this point is ongoing in academia. We would like to introduce briefly, one of which is presented below.

The study¹ presented here is being undertaken at the MIT Sloan School of Management. To examine the main factors behind the divergence, the researchers divided the divergence in ESG ratings into three contributions of scope, measurement, and weight. *Scope divergence* refers to divergence caused by differences in the attributes that are being rated. For example, one rating agency may include labor practices in its assessment, while another may not. *Measurement divergence* refers to divergence caused by rating agencies measuring the same attribute using different indicators. For example, one rating agency may evaluate a firm's labor practices on the basis of workforce turnover and another by the number of labor-related court cases taken against the firm. *Weight divergence* occurs when different rating agencies take different views on the relative importance of attributes. The MIT study categorized all 709 indicators from six ESG ratings agencies into a taxonomy of 64 categories, reporting that scope divergence contributed 38% of the divergence, measurement divergence

56%, and weight divergence 6%. This analysis showed that measurement divergence accounted for over half of rating divergence. This suggests that, even for the same attribute, different ESG rating agencies employ different indicators, which results in the declining correlation among ESG rating agencies. Regarding scope divergence, even if a company discloses information, there are cases in which that disclosed attributes are rated by the ESG rating agencies and cases in which they are not. In other words, the information disclosure will affect some ratings but not others. The analysis suggests this as a cause of the declining correlation among ESG ratings. To examine measurement divergence in more detail, the correlations among ESG ratings were calculated for each of the 64 categories. The study reported that correlation was high for some categories and low for others, with some categories even having a negative correlation. For example, membership in the UN Global Compact and CEO/Chairman separation are both categories that are easily disclosed, which means these themes are easy to obtain information for the ESG ratings agencies. Nevertheless, there are differences in their average correlations, namely 0.92 and 0.59 respectively. In addition, Lobbying and Indigenous Rights had negative correlations, suggesting the possibility that, even when a company discloses this information, different ESG rating agencies may reach completely opposite conclusions about these categories. Categories cited as having a particularly large impact on rating divergence include Climate Risk Management, Product Safety, Corporate Governance, Corruption, and Environmental Management System.

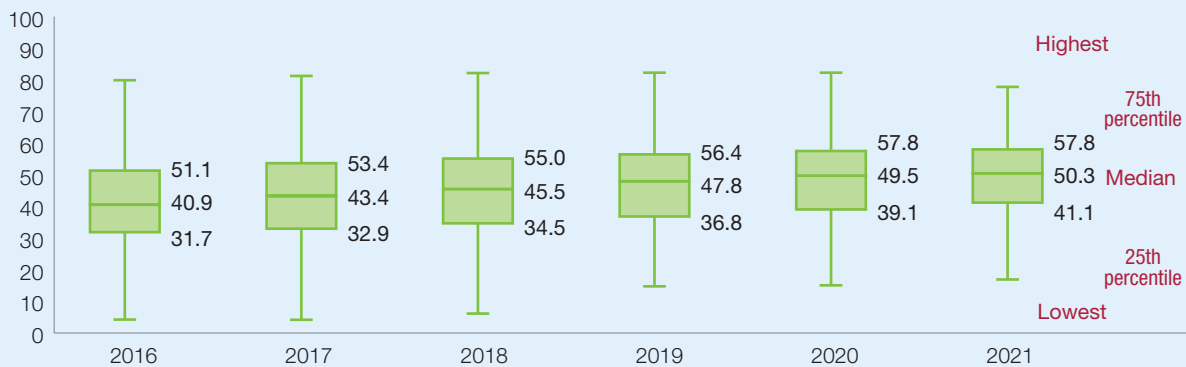
¹ MIT Management Sloan School : Aggregate Confusion Project Scope
<https://mitsloan.mit.edu/sustainability-initiative/aggregate-confusion-project>

Impact of ESG Information Disclosure on ESG Ratings and Correlations Among ESG Rating Agencies

Next, we examined what kind of relationship companies' ESG information disclosures (hereinafter disclosures) have with ESG ratings and the correlations among ratings. We used the ESG disclosure scores² calculated by Bloomberg and Arabesque for the disclosures, and for the ESG ratings, we used the ESG scores of FTSE, MSCI, and Sustainalytics. First, we plotted the trends in disclosures on a box-and-whisker plot, as shown in Figure 1. An examination of Bloomberg's disclosure scores from 2016 shows that the 25th percentile, median, and 75th percentile have all increased, confirming the steady progress in disclosures. Next, Figure 2 shows the relationship between disclosure scores and ESG ratings. Using the MSCI ACWI constituent stocks that are

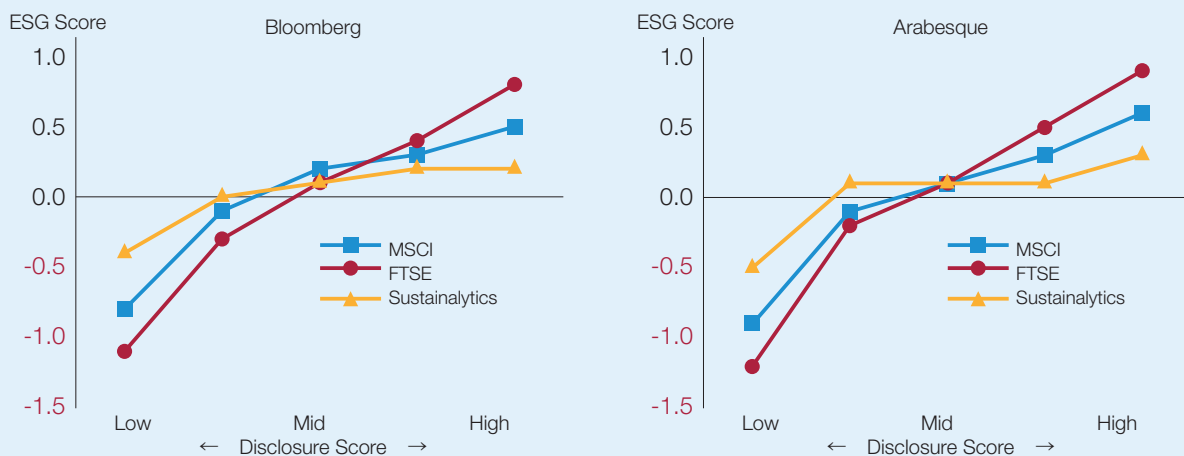
scored by all three ESG rating agencies as of March 31, 2022 for this analysis, we divided the disclosure scores of Bloomberg and Arabesque into five groups in order of highest to lowest, and calculated the average ESG score for each group. The results confirmed that, for all three ESG ratings agencies, the higher the disclosure score of the group, the higher its ESG score. This analysis also shows the differences in the characteristics of the different ratings agencies. For example, with FTSE, an increase in disclosure score, which is an indication of disclosure quantity, easily leads to a rise in ESG score, whereas with Sustainalytics, even if disclosure quantity increases, the corresponding rise in ESG score is limited.

Figure 1. Trends in Bloomberg's ESG Disclosure Scores



(Source) Prepared by GPIF based on data from Bloomberg Finance L.P. Bloomberg Finance L.P.

Figure 2. ESG Scores by ESG Disclosure Score Group



(Note) Normalized (mean 0, variance 1) and plotted ESG rating data from FTSE, MSCI and Sustainalytics. Because ESG ratings by Sustainalytics indicate a higher rating the lower the score, the symbols have been reversed.

(Source) Prepared by GPIF based on data from Bloomberg, Arabesque, FTSE, MSCI and Sustainalytics. FTSE Russell. Reproduced by permission of MSCI ESG Research LLC ©2022. @Sustainalytics. Bloomberg Finance L.P.

Finally, Figure 3 shows what kind of impact disclosure score has on the correlation of ESG ratings. We divided the correlations among the three ESG ratings agencies into three groups by disclosure score from highest to lowest and by the change over the three-year period, from greatest to smallest. We confirmed that, for all ESG rating correlations, the groups with the lower ESG score or smaller changes over time had higher correlations than the groups with the higher score or larger changes. These results suggest the possibility that companies that have made or are making progress in their disclosures are being rated differently by different ratings agencies, which is consistent with the results of the MIT research.

The existence of divergence among ESG ratings is partly the result of differences in rating methodologies employed by the

individual ESG rating agencies. However, it also highlights the current confusion among companies regarding which disclosure standards to follow given the many standards available, and difficulties faced by investors in making comparisons of ESG ratings by the same standards. When more progress is made in the standardization of the ESG disclosure frameworks, in the course of that standardization, the ESG rating agencies may also start to review their own rating methods, and the correlation among ESG ratings may increase. From this perspective, we hold great expectations for the moves toward standardization of ESG information disclosure criteria by the International Sustainability Standards Board.

Figure 3: Correlation Among ESG Ratings

By Disclosure Score Level

Disclosure Score (Level)	Bloomberg			Arabesque		
	MSCI FTSE	FTSE Sustainalytics	Sustainalytics MSCI	MSCI FTSE	FTSE Sustainalytics	Sustainalytics MSCI
Total	0.61	0.42	0.46	0.61	0.41	0.46
High	0.36	0.34	0.43	0.34	0.30	0.40
Mid	0.51	0.36	0.42	0.39	0.26	0.35
Low	0.57	0.43	0.42	0.59	0.47	0.48

By Change in Disclosure Score (March 2019 - March 2022)

Disclosure Score (Change)	Bloomberg			Arabesque		
	MSCI FTSE	FTSE Sustainalytics	Sustainalytics MSCI	MSCI FTSE	FTSE Sustainalytics	Sustainalytics MSCI
Total	0.61	0.42	0.47	0.52	0.35	0.43
High	0.50	0.37	0.43	0.46	0.30	0.35
Mid	0.61	0.38	0.45	0.56	0.42	0.51
Low	0.69	0.49	0.51	0.55	0.32	0.41

(Source) Prepared by GPIF based on data from Bloomberg, Arabesque, FTSE, MSCI and Sustainalytics. FTSE Russell. Reproduced by permission of MSCI ESG Research LLC ©2022. @Sustainalytics. Bloomberg Finance L.P.

² Bloomberg's ESG disclosure scores measure the quantity of ESG data disclosed by companies and are calculated independently by Bloomberg based on companies' ESG information disclosures. Companies that disclose no information are given a score of 0, companies that disclose information in all disclosure categories are given a score of 100, and the scores for each disclosure category are weighted according to their degree of importance. Arabesque's ESG disclosure scores are the value obtained by dividing the number of disclosed categories used in ESG Book's ESG Scores by the total number of disclosure categories.

Disclosure and Analysis of Climate-Related Financial Information: Composition and Key Points

In this, our fourth climate-related financial disclosures in line with TCFD recommendations, GPIF conducted scenario analyses of climate change-related risks and opportunities based on scenarios adopted by central banks and other institutions. We also outlined the policy trends of individual countries and the state of corporate initiatives for the transition to net zero.

Composition of Chapter 3 and Methods of Analysis

For this year's report, we appointed BloombergNEF (BNEF), FTSE, and MSCI to provide analysis support for our climate-related financial disclosures in line with TCFD recommendations, conducting a multifaceted analysis that drew on the characteristics of each of these companies. In our analysis of the carbon footprint and carbon intensity of our entire portfolio, GPIF conducts evaluations based on the greenhouse gas (GHG) emissions data provided by Trucost, which we have been using for some time.

In Chapter 3, prior to analyzing the impact of climate change risks and opportunities on GPIF's portfolio and its investee companies, we have outlined the trends in net zero policy in both the public and private sectors. Today, net zero

policies cover 99.6% of the world on a GDP basis and 99.9% on the basis of countries in GPIF's equity portfolio. Companies are advancing their responses to climate change risks and opportunities in response to moves by governments. Around the world, the number of companies declaring net zero targets is increasing every year, with 30% of the world's major corporations holding such targets as of 2021 (Please refer to page 62). As governments and companies strive to transition their way to a net zero society, it is becoming increasingly important for investors, including GPIF, to gain a proper understanding of the climate change risks and opportunities of the investee companies and to reflect them in investment decisions.

Figure 1. Analysis of Major Climate Change-Related Risks and Opportunities Conducted for This Report

Contents of Analysis	Asset Class	Analysis Performed by / Data Provided by
Carbon footprint / Carbon intensity analysis	Equities / corporate bonds	Trucost
Developments in Carbon Neutral Policy (Zero Carbon Policy Score)	Countries / industries	BNEF
Analysis of Relationship between (TPI) MQ score and Carbon Intensity	Equities	FTSE
Target Score Card Analysis	Equities	MSCI
Implied Temperature Rise Analysis	Equities / corporate bonds	MSCI
Climate Value-at-Risk (CVaR)-based analysis	Equities / corporate bonds / government bonds	MSCI
Evaluation and analysis* of SDGs alignment	Equities	MSCI
Analysis of Businesses Contributing to Climate Action	Equities	FTSE

(Note) *In the SDGs-related analysis, the degree to which GPIF's investee companies are aligned with each SDGs goal was analyzed, not only climate change-related goals.
(Source) Prepared by GPIF based on various materials

Improvement of Climate Value-at-Risk (CVaR)-Based Analysis Model

From the 2019 ESG Report, GPIF is conducting an analysis of climate change-related risks and opportunities in our portfolio using MSCI's CVaR. Climate Value-at-Risk (CVaR) model has been refined every year, and the two main changes this fiscal year were (1) the adoption of the climate scenarios announced in June 2021 by the Network of Central Banks and Supervisors for Greening the Financial System (NGFS), and (2) the ability to evaluate the impact on asset prices (government bond prices) for each NGFS climate scenario. This enabled us to analyze equities, corporate bonds and government bonds all at once using the same method, based on highly transparent and neutral scenarios adopted by major central banks such as European Central Bank (ECB) and Bank of England (BoE), is a major step forward for the analysis.

NGFS presents six scenarios based on the degree of physical and transition risks. (Figure 2)

First, there are two "orderly" scenarios. The "Net Zero 2050" scenario (1) involves limiting greenhouse gas emissions and using carbon capture and carbon removal to cut emissions close to zero as possible (net zero) by around

2050 through strict climate policies and technological innovations. The "Below 2°C" scenario (2) assumes that climate policies will gradually increase the stringency, giving a 67% chance of limiting global warming to below 2°C.

On the other hand, the "disorderly" scenarios are as follows: The "Divergent Net Zero" scenario (3) reaches net zero by around 2050, but with higher transition costs due to variations in the strictness of climate policies introduced across sectors. The "Delayed Transition" scenario (4) assumes that annual emissions do not decrease until 2030 and that strong climate policies are then needed to limit warming to below 2°C.

"Nationally Determined Contributions (NDCs)" (5) and "Current Policies" (6) are "hot house world" scenarios that envisage significant warming, the latter of which has the highest physical risks.

GPIF conducted CVaR analysis of the scenarios from (1) to (5) above for the GPIF portfolio¹. Where space limitations make it difficult to present all of these analyses, only the analysis based on the Net Zero 2050 scenario is presented.

Figure 2. Six NGFS Scenarios

Category	Scenario	Physical Risks		Temperature Rise				
			Transition Risks		Policy Reaction	Technology Change	CO ₂ Removal (CDR)	Regional Policy Variation
Orderly	(1) Net Zero 2050	Low	1.5°C	Medium	Immediate, smooth	Fast change	Medium use	Medium variation
	(2) Below 2°C	Medium	1.7°C	Medium	Immediate, smooth	Moderate change	Medium use	Low variation
Disorderly	(3) Divergent Net Zero	Low	1.5°C	High	Immediate but divergent	Fast change	Low use	Medium variation
	(4) Delayed Transition	Medium	1.8°C	High	Delayed	Slow/Fast change	Low use	High variation
Hot House World	(5) Nationally Determined Contributions: NDCs	High	Up to 2.5°C	Low	NDCs	Slow change	Low use	Low variation
	(6) Current Policies	High	3°C+	Low	None/Current Policies	Slow change	Low use	Low variation

(Note) "Temperature rise" refers to the rise in temperature from pre-industrial levels to the end of the 21st century. Red cells indicate a high level of risk, while blue cells indicate a low level of risk.

(Source) Prepared by GPIF based on NGFS Climate Scenarios for Central Banks and Supervisors (June 2021), etc.

¹ For physical risks analysis, four scenarios were used, excluding (3) Divergent Net Zero which is covered by (1) Net Zero 2050.

Analysis of Portfolio Greenhouse Gas Emissions

This analysis measures the greenhouse gas emissions (carbon footprint) of the companies held in GPIF's portfolio, based on an understanding of the characteristics of the portfolio's asset classes and sector weightings.

Features of GPIF's Portfolio

The analysis looked at four asset classes in GPIF's portfolio: domestic bonds, foreign bonds, domestic equities, and foreign equities. Alternative assets¹ and short-term assets were not included in the analysis. In the sections that follow, we analyze the measurement of greenhouse gas emission volumes ("GHG emissions") and transition risks², as well as analyzing the physical risks³ relating to these four asset classes, using data as of March 31, 2022. Because analysis results are heavily influenced by the investment amount and sector weighting of each asset class, it is important to understand the characteristics of our portfolio prior to interpreting these results.

The GPIF portfolio is composed of roughly half bonds and half equities by overall market value. As of March 31, 2022, domestic bonds accounted for 26.33% of the total portfolio, foreign bonds for 24.07%, domestic equities for 24.49%, and foreign equities for 25.11%. The majority of bond holdings, both domestic and foreign, consists of government bonds and government-related bonds (Figure 1).

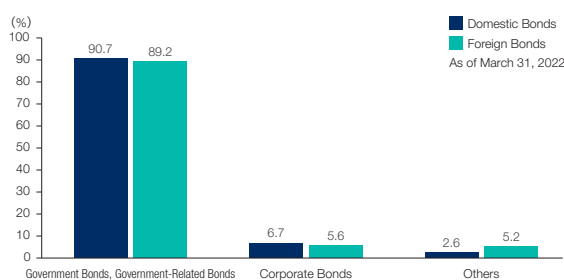
When examining GPIF's equity portfolio by sector, there is a difference in the composition of the domestic and foreign equity

portfolios (Figure 2). The domestic equity portfolio has a higher proportion invested in the relatively high-emitting industrials and consumer discretionary sectors, while the foreign equity portfolio has a high proportion in the low-emitting information technology, financials, and healthcare sectors.

There is also a difference in the composition by industry sector in GPIF's corporate bond portfolio between domestic bonds and foreign bonds. Looking at the corporate bond portfolio, financials accounted for the largest proportion for both domestic and foreign bond portfolios (Figure 3). Among domestic corporate bonds, the proportion invested in the utilities and consumer discretionary sectors is higher than that for foreign corporate bonds. Among foreign corporate bonds, the proportion invested in the high-emitting energy sector is higher than that for domestic corporate bonds, but there is also a high proportion invested in the low-emitting sectors of telecommunications services, healthcare, and information technology.

The next figure (Figure 4) looks at characteristics in GHG emissions by asset class and industry sector. The data shown here is for GHG emissions per million yen of sales. Emissions are high in the energy, utilities, and materials sectors in both equity and corporate bond portfolios. Since the energy sector includes oil and coal companies, the utilities sector includes electric power companies, and the materials sector includes chemicals and iron and steel manufacturers, these three sectors tend to emit higher GHG emissions than other sectors. GHG emissions data coverage of GPIF's portfolio was 99.7% for domestic equities, 98.9% for foreign equities, 96.4% for domestic bonds, and 89.8% for foreign bonds.

Figure 1. Breakdown by Category in GPIF Bond Portfolio



(Note) "Other" includes securitized products.
(Source) GPIF

1 Alternative assets account for around 1.07% of the pension reserve fund, and are generally allocated to the four main portfolio asset types according to their characteristics.

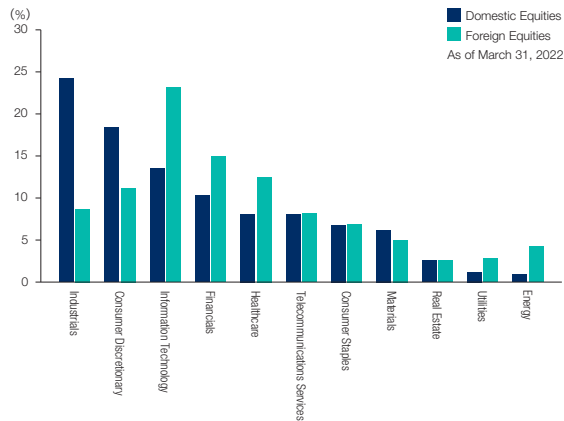
2 Transition risks are risks that arise from policy, technological innovation, demand change, etc. that accompany the transition to a low-carbon economy.

3 Physical risks are risks from direct damage to an asset, supply chain disruption, etc., caused by climate change.

It is necessary to bear this sector bias in GHG emissions in mind when understanding the results of the analysis presented in the following sections. Around 90% of stock investments and 80%

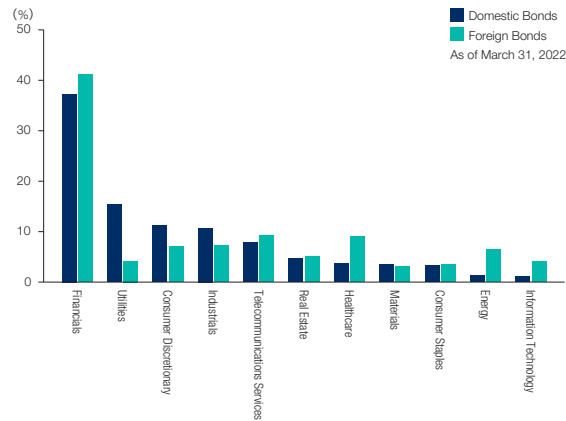
of bond investments by GPIF are passive investments, which means our investment is virtually identical to the sector ratios of each benchmark.

Figure 2. Breakdown of GPIF Equity Portfolio by Sector⁴ Based on Total Market Value



(Source) GPIF

Figure 3. Breakdown of GPIF Bond (Corporate Bonds) Portfolio by Sector Based on Total Market Value



(Note) Only corporate issues are analyzed.
(Source) GPIF

Figure 4. Greenhouse Gas Emissions per Million Yen of Sales (CO₂ Equivalent Tons)

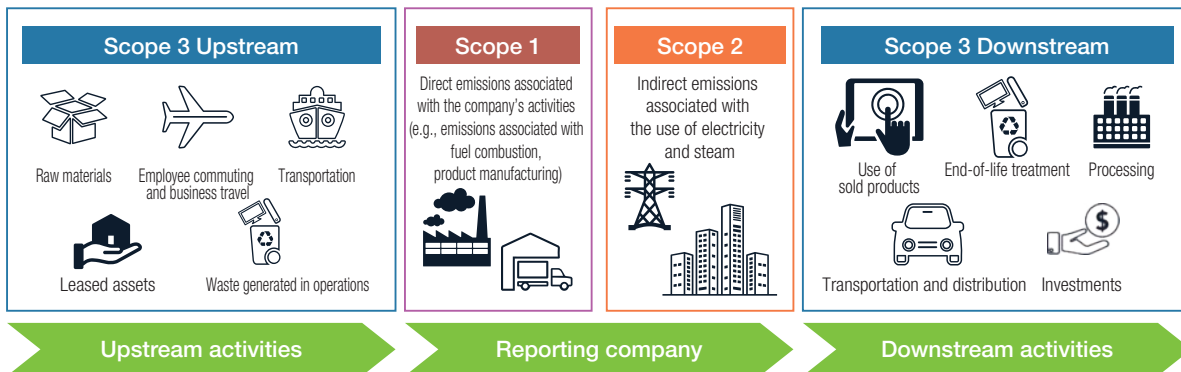
	Energy	Utilities	Materials	Industrials	Consumer Discretionary	Consumer Staples	Information Technology	Real Estate	Telecommunications Services	Healthcare	Financials
Domestic Equities	27.48	20.67	14.86	13.15	8.61	4.81	3.12	2.89	1.31	1.06	0.66
Foreign Equities	51.58	27.28	30.23	13.51	7.06	5.84	2.85	3.45	1.10	1.10	1.30
Domestic Bonds	26.80	12.60	14.69	7.21	11.26	3.76	4.56	2.75	1.36	1.06	0.94
Foreign Bonds	47.30	27.36	27.18	11.69	9.24	8.05	2.62	3.25	0.99	1.06	1.95

(Note) The calculation scope of greenhouse gas emissions includes Scopes 1, 2, and 3. The year-to-year percentage change in GHG emissions of plus or minus 1% have been excluded from calculations as outliers. Data is as of March 31, 2022 (GHG emissions data is calculated from available data as of March 31, 2022).

(Note) Carbon footprint is apportioned based on the percentage of the stocks/bonds holdings of the issuing companies. The apportion is calculated using the size of the holding in stocks/bonds in the issuing companies at the time of analysis as the numerator and the enterprise value including cash (EVIC) as the denominator.

(Source) Prepared by GPIF based on data from S&P. S&P Global Sustainable1, S&P Trucost Limited ©Trucost 2022

Figure 5. Greenhouse Gas Emissions by Scope



(Note) The above figure indicates the major sectors included in each scope.

(Source) Created by GPIF based on the Greenhouse Gas Protocol, etc.

⁴ Based on the 11 sectors of the Global Industry Classification Standard (GICS).

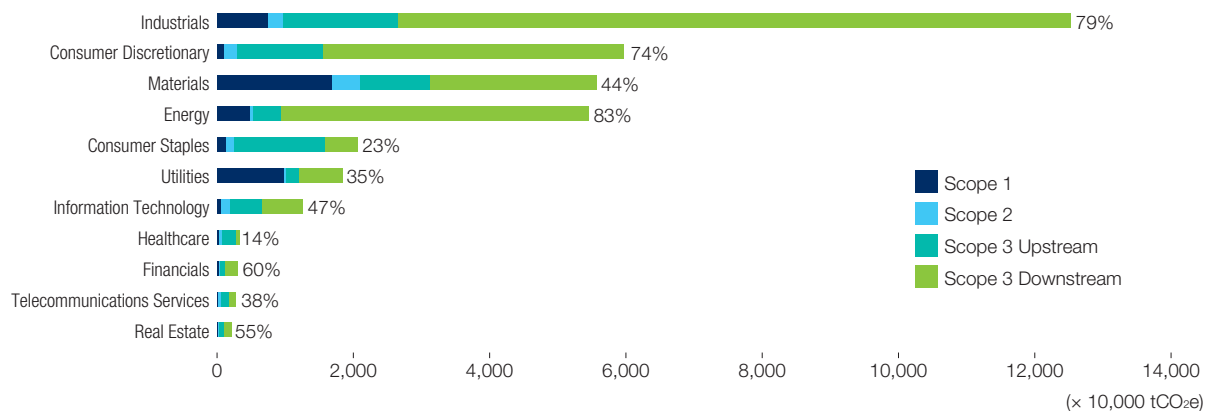
"Communications services" in the GICS sector is expressed here as "telecommunications services." The same applies on all following pages.

Greenhouse Gas Emissions by Sector Significantly Affected by Scope 3

Since last fiscal year, we have expanded the calculation scope of GHG emissions to include indirect emissions from the consumption and use of sold products and services (Scope 3 downstream) in addition to direct emissions by the company itself (Scope 1), indirect emissions related to purchased electricity (Scope 2), and indirect emissions from procured products and services other than purchased electricity (upstream Scope 3) (Figure 5 on previous page). Figure 6 shows emissions¹ for the whole combined equity and bond portfolio at the end of FY2021 by sector and by scope. Downstream Scope 3 emissions account for an extremely high proportion of total

emissions in the industrials, consumer discretionary, and energy sectors. Caution is required when analyzing portfolios with a higher weight of companies in these sectors, as analysis results change significantly depending on whether or not Scope 3 is included in the calculation. In the analyses below, the year-to-year percentage change in GHG emissions of plus or minus 1% have been excluded from calculations as outliers. Further, many companies do not disclose their Scope 3 emissions, leading to a dependence on estimates from models. For this reason, scope 3 emissions are excluded from calculations of emission trends (Figures 8 and 10).

Figure 6. GHG Emissions by Scope (Whole Portfolio)



(Note) Available data as of March 31, 2022.
 (Note) Numbers on graph are the percentage of Scope 3 Downstream emissions to total emissions.
 (Source) Prepared by GPIF based on data from S&P, S&P Global Sustainable1, S&P Trucost Limited ©Trucost2022

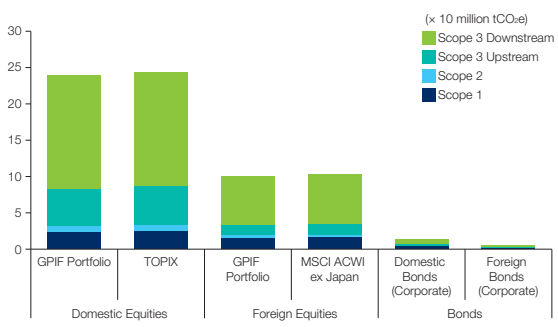
Carbon Footprint (GHG Emissions) Analysis

Figure 7 shows the calculation of Scope 1-3 emissions² for the equity and bond portfolios as of the end of FY2021. Looking at the total GHG emissions by asset class, domestic equities were found to have the highest level of emissions, followed by foreign equities, domestic corporate bonds, and foreign corporate bonds. This primarily reflects the relative size and sector of holdings of each asset class within GPIF's portfolio as shown in Figures 2 to 4. The breakdown of GHG emissions in each asset class shows that Scope 3 accounts for the major proportion of total emissions for all assets. This would suggest that identifying GHG emissions across the

entire supply chain, not just the company itself, is crucial for the implementation of efficient emission reduction measures. Figure 8 shows GHG emission trends of combined Scope 1 and 2, using 100 for fiscal 2016 emissions as a base. In the five years from fiscal 2016, GHG emissions have generally declined in all asset classes. Changes in companies held and size of holdings in the portfolio are the main cause of this trend, but in the most recent data, decreases in emissions, as seen in recent TOPIX and MSCI ACWI figures, are also a factor.

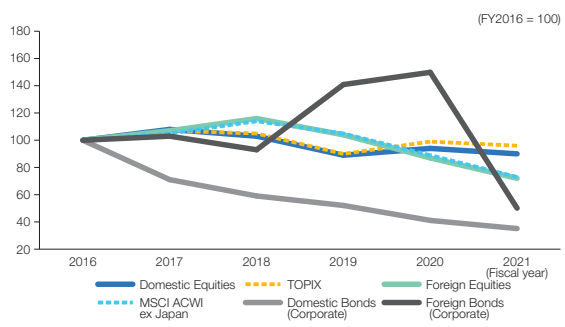
1, 2 Carbon footprint is apportioned based on the percentage of the stocks/bonds holdings of the issuing companies. The apportion is calculated using the size of the holding in stocks/bonds in the issuing companies at the time of analysis as the numerator and the enterprise value including cash (EVIC) as the denominator.

Figure 7. Greenhouse Gas Emissions by Scope



(Note) Figure 7: Data available as of March 31, 2022. (Note) Figure 8: Greenhouse Gas emission calculated based on Scope 1+2
 (Source) Figures 7 & 8: Prepared by GPIF based on data from S&P, S&P Global Sustainable1, S&P Trucost Limited ©Trucost2022

Figure 8. Greenhouse Gas Emission Trends

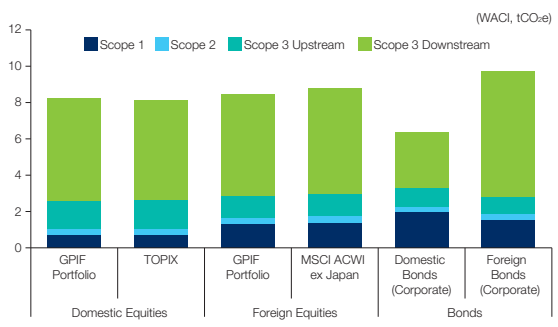


Carbon Intensity Analysis

Figure 9 shows Scope 1-3 carbon intensity for the equities and bond portfolios at the end of FY2021. For this analysis, weighted average carbon intensity (WACI), the disclosure of which is recommended by the TCFD, was used as the basis for calculation of carbon intensity. WACI is calculated by multiplying each company's GHG emissions per million yen of sales by the company's weighting in the portfolio, then taking the sum of those products to obtain the weighted average of carbon intensity. By asset class, WACI was highest in the foreign bond portfolio, followed by foreign equities and domestic equities at almost the same level, with domestic bonds having the lowest WACI. In all asset classes, Scope 3 accounts for the major proportion of WACI. This is due to the allocations to high-emitting sectors shown in Figure 6. The WACI for foreign corporate bonds is much higher than that for domestic corporate bonds. The main reason for this is that, in many sectors, foreign bond issuers

tend to have higher carbon intensities than domestic bonds issuers. This trend is particularly noticeable in the energy, financials, and industrials sectors. Figure 10 shows the trend of WACI, using 100 for combined Scope 1 and 2 emissions in fiscal 2016 as a base. In the five years from fiscal 2016, WACI has generally declined in all asset classes, which is generally in line with the trends in GHG emissions shown in Figure 8. In the most recent figures, WACI has risen slightly in the domestic equity and foreign equity portfolios. The reason behind this is of a rise in WACI in the energy and industrial sectors for domestic equities and in the energy sector for foreign equities. WACI trended almost the same between the domestic equity portfolio and TOPIX, as well as between the foreign equity portfolio and MSCI ACWI (ex China). This is due to the fact that the majority of investments in these portfolios are passive investments.

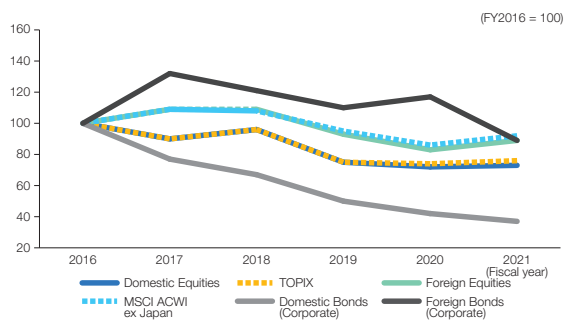
Figure 9. Weighted Average Carbon Intensity (WACI) by Scope



(Note) Figure 9: Data available as of March 31, 2022. (Note) Figure 10: WACI calculated based on Scope 1+2

(Source) Figures 9 & 10: Prepared by GPIF based on data from S&P, S&P Global Sustainable1, S&P Trucost Limited ©Trucost2022

Figure 10. Trends in Weighted Average Carbon Intensity (WACI)



Public- and Private-Sector Support for Achieving a Net-Zero Economy

The Glasgow Climate Pact resulting from the latest UN Climate Change Conference, COP26 in November 2021, showed continued global momentum for decarbonization. This section reviews current decarbonization targets and strategies of countries and companies.

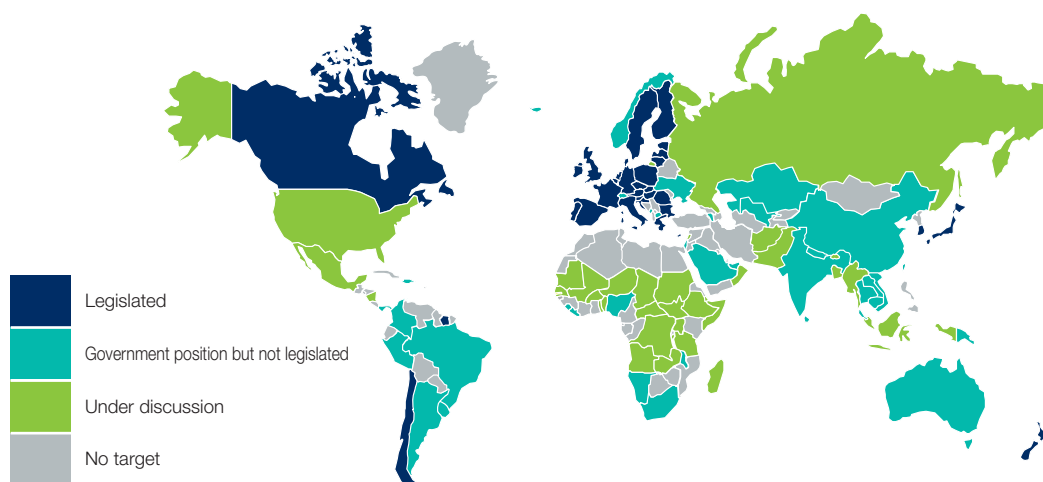
Decarbonization Policy Trends

In the analyses presented in previous sections, consideration was given to the carbon footprint of the GPIF portfolio, which changes according to the greenhouse gas emissions volumes (GHG emissions) of companies and countries. In this section, a top-down approach has been employed to organize the carbon net zero policies of individual countries and the setting of decarbonization targets by companies which would directly affect countries' and companies' GHG emissions. These analysis outsourced to BloombergNEF (BNEF) would present a means of visualizing major structural changes in the future towards net zero.

At COP26 in 2021, "pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels" was included in the Glasgow Climate Pact. Moves toward net zero in the lead-up to COP26 could be seen from 2019. Chair nation, United Kingdom, started the ball rolling

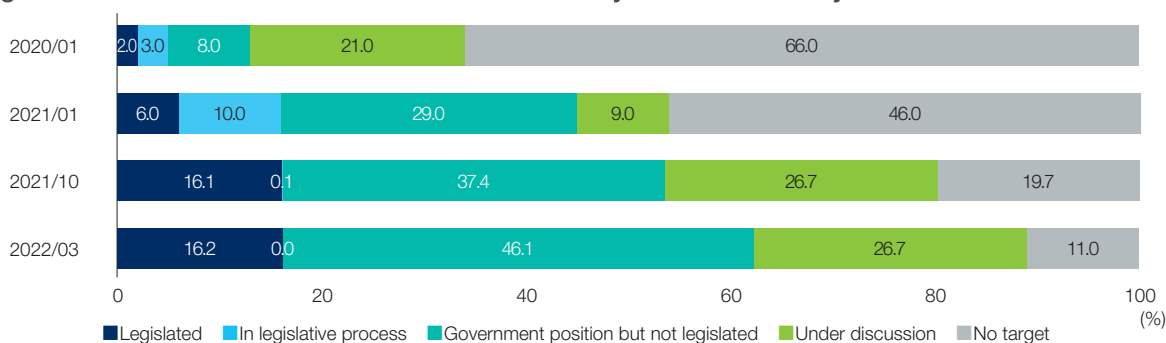
by legislating its net zero targets, and since then, many countries, including the various European nations, China, and Japan have been pursuing decarbonization initiatives aimed at net zero by 2050 to 2060. According to BNEF data, more and more countries are declaring their own net zero targets, with 88 countries having committed (already legislated or in government position) to net zero as of March 2022 (Figure 1). The ways to declare net zero vary, with only 17.6% of countries, including the European nations and Japan, having legislated their targets. Most countries are still at the pre-legislation stage of government commitment (28.0%) or have just started discussing legislation (30.1%). Taking global GHG emissions in 2019 as the total, 89% of total emissions as of March 2022 are subject to commitment or preparations for commitment. This is a significant progress since 2020 (Figure 2).

Figure 1. Countries with Net Zero Targets (As of March 2022)



(Source) BloombergNEF

Figure 2. Share of Global GHG Emissions Covered by a Net-Zero Policy

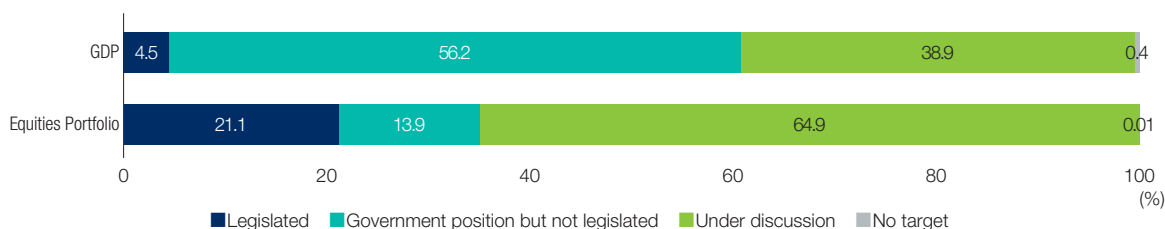


(Note) Based on GHG emissions in 2019 as the total.
 (Source) BloombergNEF

In terms of the commitment coverage rate based on gross domestic product (GDP), 99.6% of global GDP is covered by net zero commitments or preparations currently in progress. In addition to GDP, analysis of the commitment coverage rate based on GPIF's equities portfolio found that coverage was 99.9%, based on the countries to which the markets where GPIF's holdings are listed belong (Figure 3). While coverage on a GHG emissions basis is just under 90%, on the basis of GDP and GPIF's equities portfolio, more than

99% is headed toward net zero. As the world moves toward 2030 and 2050 targets, individual countries are expected to mobilize fiscal and monetary policies alongside environmental regulations. GPIF believes that, as a global investor that invests in almost all the equities and bonds that are out in the market, it is crucial that we have an accurate understanding of the major changes in those policies for us to steer our portfolio in the appropriate direction.

Figure 3. Coverage of Carbon Neutrality Commitments (GDP and GPIF Equities Portfolio)



(Note) Weighted averages of GDP (2019) and GPIF portfolio constituent stocks (as of March 31, 2022) have been calculated according to GHG emissions by country.
 (Source) GPIF, BloombergNEF

Visualization of the Impacts of Net Zero Policies

To understand developments in global net zero policies, we analyzed individual countries' net zero targets using BNEF's Zero Carbon Policy Scoreboard.

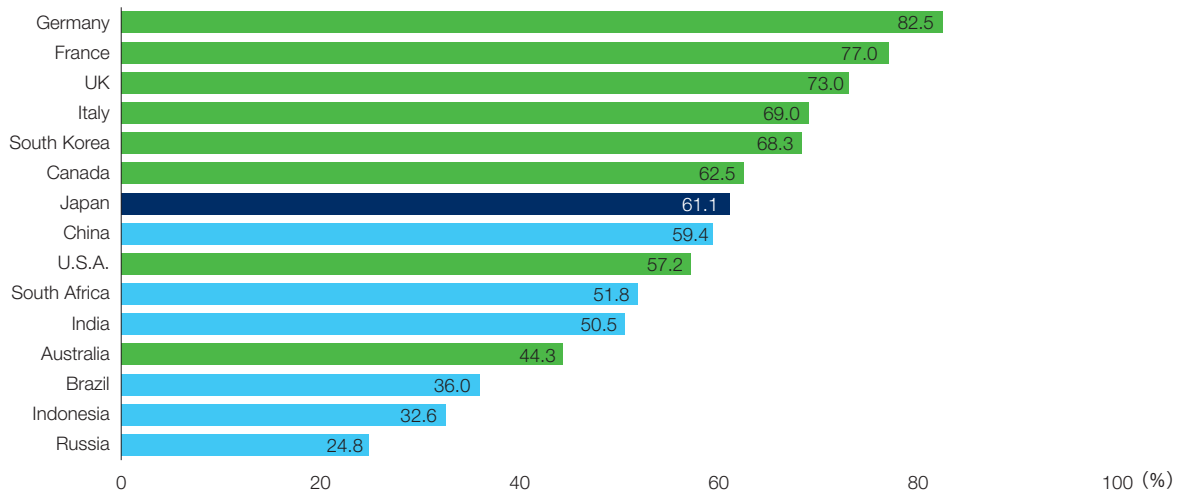
The policies announced by each country are evaluated according to 130 metrics under the three themes of policies' (1) presence, (2) robustness, and (3) effectiveness. In terms of policy presence, BNEF analyzes what kind of policies are being implemented in six major areas, namely power, low-carbon fuels and CCUS, transport, buildings,

industry, and the circular economy. At the same time, the ambition and stringency of each policy are also analyzed. Given that net zero policies affect many industries, their robustness is also evaluated using metrics of transparency (such as a government publishing details about a policy on a public website, including description, status, method of implementation, etc.) and stringency of targets. Finally, the effect of policies when implemented is evaluated using "policy effectiveness" indicators.

A ranking of scores obtained with the above methodology puts the European countries of Germany, France, U.K. and

Italy at the top, with Japan, China and the United States ranking in the middle of the pack (Figure 4).

Figure 4. Zero Carbon Policy Scores of Major Countries



(Note) Carbon policy scores are given to countries belongs to the G20. Green indicates developed countries, while blue indicates developing countries.
 (Source) BloombergNEF, GPIF

Next, when the breakdown of those scores is evaluated, Germany scored well for its introduction of a renewable energies auction program, the announcement of a proposal to phase out coal-fired power generation, and the introduction of a domestic emissions trading scheme, taking out first place in four areas - power, low carbon fuels and CCUS, buildings, and industry. Japan was assessed as being less ambitious in its targets than the top-scoring countries.

Specifically, in transport, the low target for EVs' share of new passenger car sales in 2030, and in power, its inability to give a clear indication regarding the phase out of coal-fired power generation appear to have led to Japan's low scores. On the other hand, due to Japan's small land area, its industrial waste taxes are relatively high, and per-capita municipal waste generation is low, making it one of the best performers in the circular economy area (Figure 5).

Figure 5. Comparison of Zero Carbon Policy Scores by Theme

	Power	Low-carbon fuels and CCUS	Transport	Buildings	Industry	Circular economy
Germany	84%	75%	88%	81%	78%	65%
France	76%	60%	89%	73%	69%	67%
UK	83%	71%	77%	56%	72%	67%
Italy	73%	43%	84%	71%	58%	64%
South Korea	73%	55%	70%	62%	63%	70%
Canada	67%	63%	68%	47%	54%	39%
Japan	62%	55%	62%	68%	56%	69%
China	67%	43%	75%	53%	52%	28%
U.S.A.	59%	69%	63%	45%	38%	33%
South Africa	67%	23%	29%	32%	39%	34%
India	60%	37%	58%	41%	42%	35%
Australia	53%	35%	33%	50%	44%	40%
Brazil	56%	50%	33%	30%	23%	38%
Indonesia	32%	33%	33%	32%	32%	35%
Russia	36%	16%	22%	18%	19%	33%

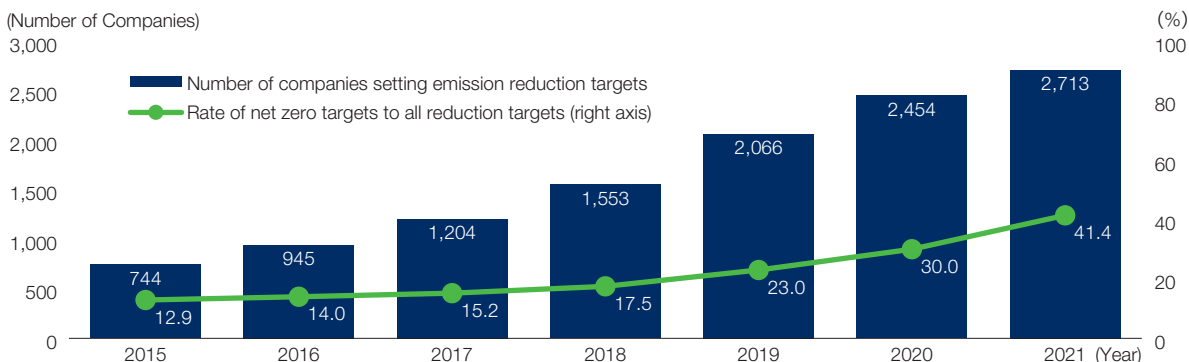
(Source) BloombergNEF, GPIF

Status of Companies' Setting of Greenhouse Gas Emission Reduction Targets

Carbon neutrality will not be achieved by national governments alone; it requires the combined efforts of government and the private sector. The following section examines the status of setting of GHG emissions reduction targets by companies. Among the companies in the MSCI ACWI Investable Market Index (IMI), an equity index having the world's main equities

as constituents, the number of companies setting GHG emissions reduction targets has been growing since 2015. (Figure 6) As of the end of 2021, 2,713 of the total 9,220 constituents, or 29.4%, had set some kind of reduction target. More companies are also setting long-term targets for net zero, accounting for 41.4% of new targets set in 2021.

Figure 6. Number of Companies with GHG Emissions Reduction Targets and Rate of Net Zero Targets to All Reduction Targets

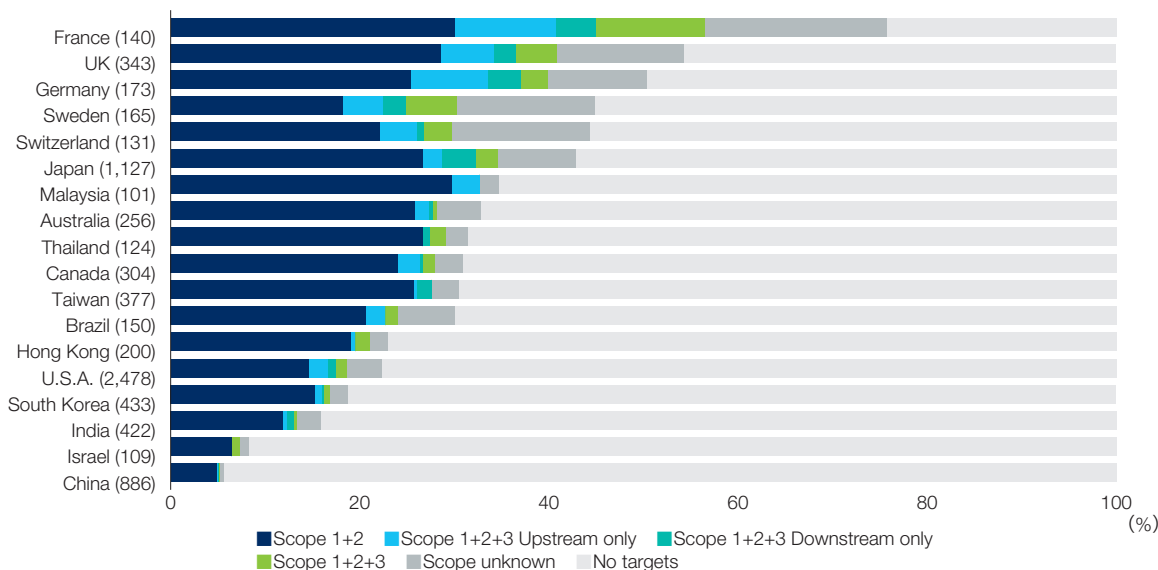


(Note) The rate of net zero targets to all reduction targets is calculated from new targets set each year by MSCI ACWI IMI constituents.
 (Source) Reproduced by permission of MSCI ESG Research LLC ©2022

When the status of corporate reduction targets among companies in the MSCI ACWI IMI is examined by country, we find that many companies in the European countries that topped the Carbon Policy Scoreboard, namely France, the

U.K. and Germany, have set targets (Figure 7). A trend can also be seen with developed countries having a higher percentage of companies setting decarbonization targets.

Figure 7. Status of GHG Emissions Reduction Targets by Constituent Companies of MSCI ACWI IMI (By Country)



(Note) Covers 9,179 stocks with data in the MSCI ACWI IMI. Countries with at least 100 eligible companies (26 developed countries, 30 emerging countries) are shown on the graph. Figures in brackets are the number of companies in that country.
 (Source) Reproduced by permission of MSCI ESG Research LLC ©2022

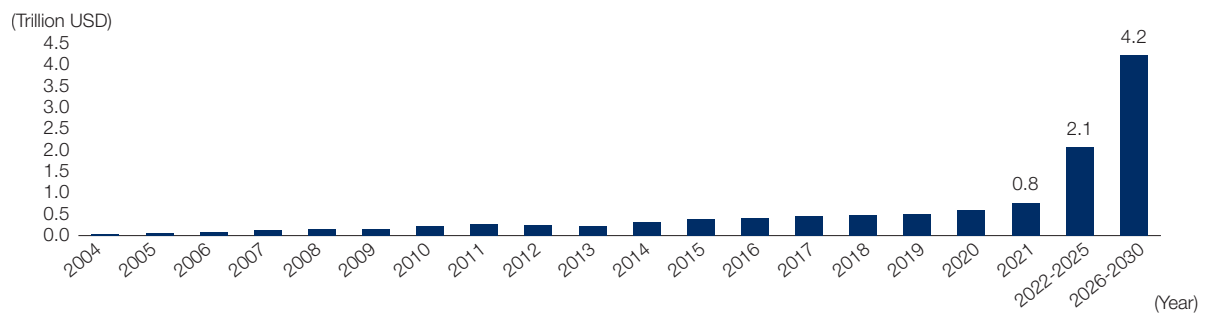
Decarbonization Technologies Investment Trends

To achieve net zero, a transition to low carbon-intensity business models will be needed in a wide range of industries. This will require the large-scale deployment of decarbonization technologies. Among such technologies, there are examples like solar and wind power generation, where prices have fallen thanks to technological progress and that are already starting to replace conventional technologies. However, the deployment of large-scale decarbonization technologies will require enormous amounts of investment. According to BNEF analysis, \$755 billion was invested in energy transition in 2021 (Figure 8). This accounts for 0.84% of the world's GDP in 2021, and investment is consistently breaking new records

at a growth rate of 10% a year. Investment in China, in particular, grew to \$285.5 billion in 2021, representing an increase of more than 60% over 2020. (Figure 9). With China leading the way, new record highs are being achieved in investments in the areas of renewable energy and electric vehicles (Figure 9).

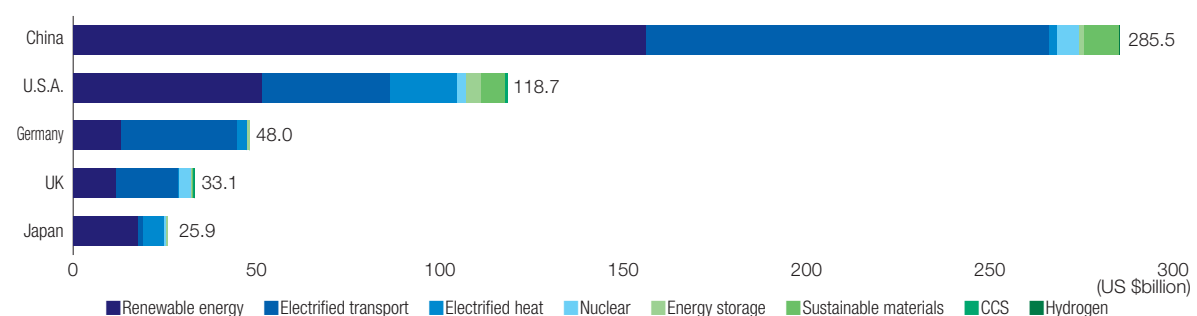
According to the International Energy Agency (IEA), global investments in clean energy will need to reach approximately \$4 trillion a year, three times current levels, by 2030 if carbon neutrality is to be achieved in 2050. A further rapid growth in investment in these areas can be expected.

Figure 8. Decarbonization Technologies Investment Trends¹



(Note) Amounts for 2022-2025 and 2026-2030 are the averages of estimates based on the three scenarios in BloombergNEF's New Energy Outlook (NEO). Investment amounts shows the total investments represented in Figure 9.
(Source) BloombergNEF, GPIF

Figure 9. Investment Amounts in Decarbonization Technologies in 2021 (by Country and Technology)



(Note) Investment amounts in 2021
(Source) BloombergNEF, GPIF

In this part, revenue data from business activities in 2020 is used to analyze the impacts of global demand for decarbonization technologies on company revenues, using market growth rate forecasts in each business segment until 2050. The change in revenue of businesses with high carbon intensity and those with

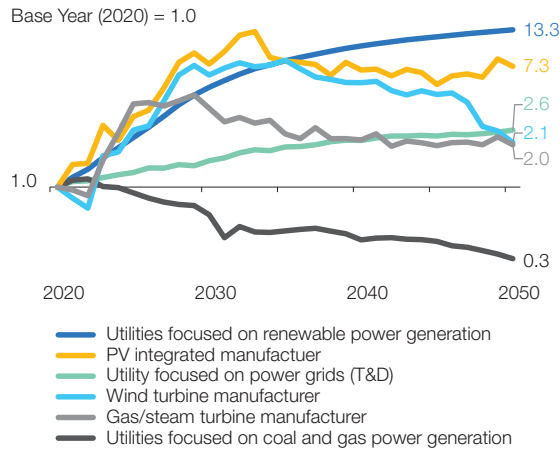
low carbon intensity in the power and transport sectors show that, in both sectors, companies with large exposure to high carbon-intensive activities will experience a reduction in revenues (Figures 10 and 11).

¹ Capital investment by private-sector and government subsidies (total of amounts granted)

As shown in Figures 10 and 11, in the larger transition toward decarbonization, companies that are unable to adapt will be left behind and may become less competitive due to

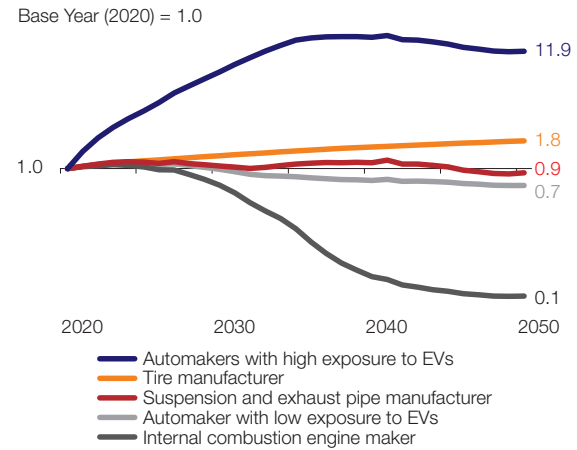
regulations. Declaring a decarbonization target is a major step forward, but the next requirement is concrete action, such as active investments towards transition.

Figure 10. Outlook of Revenue Structure Changes for Representative Companies in the Power Sector



(Note) Based on Green Scenario in BloombergNEF's New Energy Outlook (NEO).
(Source) BloombergNEF

Figure 11. Outlook of Revenue Structure Changes for Representative Companies in the Transport Sector



(Note) Based on Net Zero Scenario in BloombergNEF's New Energy Outlook (NEO).
(Source) BloombergNEF

Interview with Research Project Leads

BloombergNEF Albert Cheung, Head of Global Analysis
Ali Izadi Najafabadi, Head of APAC Research

1 Will the resurgence in demand for fossil fuels caused by the invasion of Ukraine become an impediment to achieving the 2050 carbon neutrality targets? Also, what kind of impact has it had on BNEF's energy outlook?

The apparent increase in fossil fuel demand in 2022 is primarily due to the rapid recovery from artificially low demand levels caused by the Covid-19 pandemic. Aside from lowering demand, the pandemic had also caused significant uneven disruption in supply chains. Russia's invasion of Ukraine has further exacerbated these challenges, and will likely prolong them. As European countries and their allies try to reduce fossil fuel imports from Russia, their increased demand for non-Russian energy supplies is further disrupting traditional fossil fuel trade routes, resulting in higher prices. Still, we have not observed any major pullback from long-term energy transition goals and commitments from major economies due to Russia's war in Ukraine.

2 Will the recent surge in energy prices affect development investment and capital investment in fossil fuels and renewable energies? Are the effects different in the short and long term?

In the past, sharp rises in energy prices led to increases in capital investment related to fossil fuels. However, this time, fears of an economic downturn, resurgence of Covid and longer term concerns about demand destruction due to the energy transition are all leading to a more conservative approach from companies. In contrast, we predict that investment in solar and wind power generation will increase toward 2030. Although there is a risk of rising capital investment costs, implementation is accelerating in Europe and Asia, and policies are driving growth. However, at the current rate of investment, it will be difficult to achieve net zero in 2050. In the long term, investment in fossil fuels will need to be kept at an "appropriate size," and investment in clean energies will need to increase rapidly.

Corporate Initiatives in Anticipation of Transition to a Carbon-free Society and Their Evaluation

Corporate initiatives and target setting in anticipation of transition to a carbon-free society were analyzed in three areas: (1) relationship between the quality of corporate management and changes in carbon intensity; (2) state of companies' setting of targets for the reduction of greenhouse gas emissions; and (3) warming potential resulting from the setting of targets by investee companies and other factors.

Evaluation of Management Quality of Companies Toward Transition to a Carbon-free Society (MQ Score)

In the previous section, movements in net zero were examined from macro perspectives, but in this section, we will ascertain the status of action toward transition to a low-carbon economy with a bottom-up approach from the level of individual companies, using TPI Management Quality (MQ) Scores, targeting the world's major companies.

MQ Score was developed by the Transition Pathway Initiative (TPI), which supports climate change initiatives. Using companies' disclosed information, TPI calculates MQ Score to rate their management of greenhouse gas (GHG) emissions and the quality of their responses to risks and opportunities related to the transition to a low-carbon economy. MQ Scores are divided into six levels, from Score

0 to Score 5, in order of lowest to highest evaluation of companies' climate change initiatives (Figure 1). The disclosure themes recommended by the TCFD are reflected in the evaluation of MQ Scores, and companies must disclose their GHG emissions and reduction targets to obtain a score of 3 or above. For this reason, companies working on TCFD responses tend to have higher MQ scores.

MQ Score was used as an evaluation criterion in the selection of the constituent stocks for the FTSE Blossom Japan Sector Relative Index, which GPIF has newly selected as an ESG index in FY2021 (please refer to Page 19 for details), as a way of determining whether stocks with high carbon intensity are preparing for transition to decarbonization.

Figure 1. Evaluation Indicators Used in Measurement of MQ Score

Score 0 Unaware of (or not acknowledging) Climate Change as a Business Issue	Q1: Does the company acknowledge climate change as a significant issue for the business?
Score 1 Acknowledging Climate Change as a Business Issue	Q2: Does the company recognise climate change as a relevant risk and/or opportunity for the business? Q3: Does the company have a policy (or equivalent) commitment to action on climate change?
Score 2 Building Capacity	Q4: Has the company set greenhouse gas emission reduction targets? Q5: Has the company published information on its operational (Scope 1 and 2) greenhouse gas emissions?
Score 3 Integrating Into Operational Decision-Making	Q6: Has the company nominated a board member or board committee with explicit responsibility for oversight of the climate change policy? Q7: Has the company set quantitative targets for reducing its greenhouse gas emissions? Q8: Does the company report on Scope 3 emissions? Q9: Has the company had its operational (Scope 1 and/or 2) greenhouse gas emissions data verified? Q10: Does the company support domestic and international efforts to mitigate climate change? Q11: Does the company have a process to manage climate-related risks? Q12: (Applicable to some sectors only) Does the company disclose materially important Scope 3 emissions?
Score 4 Strategic Assessment	Q13: Does the company disclose its membership and involvement in organisations or coalitions dedicated specifically to climate issues? Q14: Has the company set long-term quantitative targets for reducing its greenhouse gas emissions? Q15: Does the company's remuneration for senior executives incorporate climate change performance? Q16: Does the company incorporate climate change risks and opportunities in their strategy? Q17: Does the company undertake climate scenario planning? Q18: Does the company disclose an internal price of carbon? Q19: Does the company ensure consistency between its climate change policy and the positions taken by trade associations of which it is a member?
Score 5 Satisfies all indicators	Satisfies all indicators

(Source) Prepared by GPIF based on *The Transition Pathway Initiative*, FTSE Russell

Analysis of Relationship Between MQ Score and Carbon Intensity

If MQ score accurately rates the quality of a company's action toward transition to a carbon-free society, it is expected that the rank of its MQ score will affect its carbon intensity.

First, based on the annual MQ Scores for 2018, 2019, and 2020, we observed single year changes in carbon intensity by calculating the average rate of change in carbon intensity for each score one year later for each year (Figure 2(1)). For example, this classifies the companies for each 2018 MQ Score and examines how carbon intensity has changed on average one year later for each group of companies. Here, the analysis was performed for the three periods of 2018, 2019, and 2020, and the average of the three results is shown on the graphs below. As a result, the groups of companies with low MQ Scores of 0, 1 and 2 showed increases in average carbon intensity, whereas it decreased in the groups of companies with high MQ Scores of 3, 4 and 5. The difference in results between the group of Score 2 companies, evaluated as "Building Capacity," and the group of Score 3 companies, evaluated as "Integrating Intro Operational Decision-Making" is particularly distinctive.

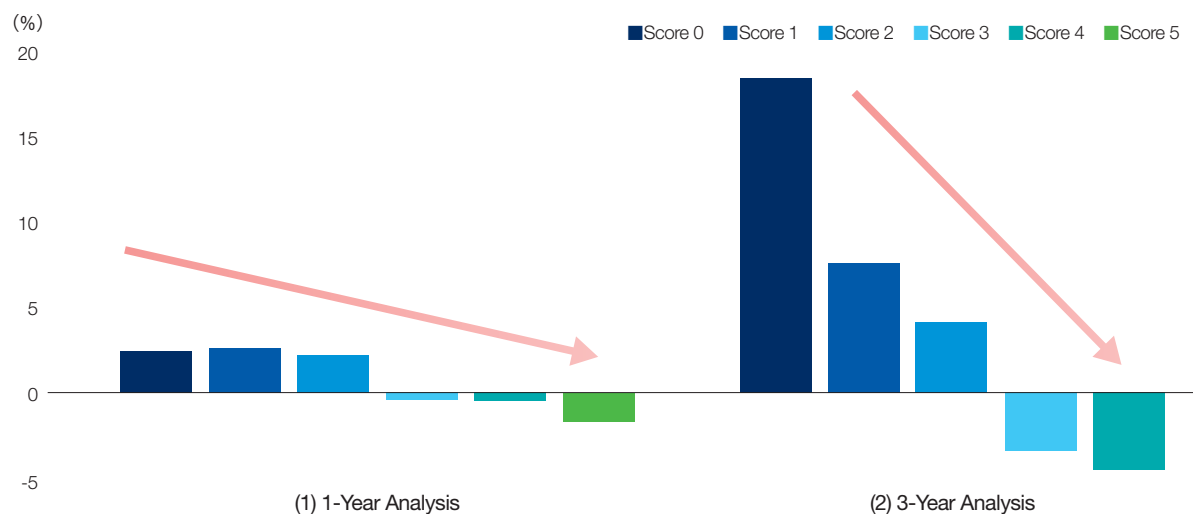
By rights, rather than believing that improving the quality of response to the risks and opportunities of transition to a

low-carbon economy would bring an improvement in carbon intensity after one year, it would be more natural to consider that such effect would manifest over several years.

Therefore, to ascertain the change over a slightly longer period, based on the 2018 MQ Scores, we examined the average rate of change in carbon intensity of the groups of companies at each Score level after three years, until 2021 (Figure 2(2)). The groups of companies with higher MQ scores in 2018 showed a tendency for carbon intensity to decline on average after three years. Further, that tendency was more conspicuous in the results in (2) for the longer period than for the single-year results in (1).

As shown above, although it should be noted that this analysis is for an extremely limited period, in that period, the carbon intensity of companies with high MQ Scores tended to fall, and these results confirm that such a tendency becomes more evident when viewed over longer periods. Consequently, companies with MQ Scores of 3 or above are expected to lower their carbon intensity over the long term. On the other hand, because companies with MQ Scores of 2 or below account for around 60% of the companies analyzed, we expect them to strengthen their TCFD initiatives.

Figure 2. Average Rate of Change in Carbon Intensity for Each MQ Score



(Note) (1) 1-Year Analysis in the graph shows the average of the three single-year analyses of changes in companies' carbon intensity after one year, from the MQ Scores for each of 2018, 2019, and 2020. (2) 3-Year Analysis shows the change in companies' carbon intensity after three years until 2021 based on the 2018 MQ Scores.

(Note) Score 5 was used only in analysis from 2020 onward, when it became available.

(Source) FTSE Russell

Target Score Card Analysis

In this section, the existence of companies' greenhouse gas emissions targets (GHG reduction targets) and the coverage rate of companies' GHG reduction targets to GHG emissions ("emissions coverage rate") is analyzed using MSCI's Target Score Card.

The analysis examined individual companies that constitute indexes in three regions, namely Japan (MSCI Japan IMI), developed markets (MSCI Kokusai IMI), and emerging markets (MSCI EM IMI).

For the aggregating of data, based on the GHG emissions of individual companies, data for each scope (1) was calculated, and GHG emissions reduction target data (2) for each company was totalled. The extent of the scopes targeted in disclosures was confirmed and, based on (1) and (2), the emissions coverage rate (3) was calculated. The data in (1) to (3) has been added up by sector for each index.

The results show that, for both Japanese companies and companies in developed markets included in MSCI Kokusai IMI (developed-market companies) and companies in emerging markets included in MSCI EM IMI (emerging-market companies), emissions coverage rate was highest in the utilities sector. In all three regions, the financial sector had the lowest or second lowest ESG emissions coverage rate,

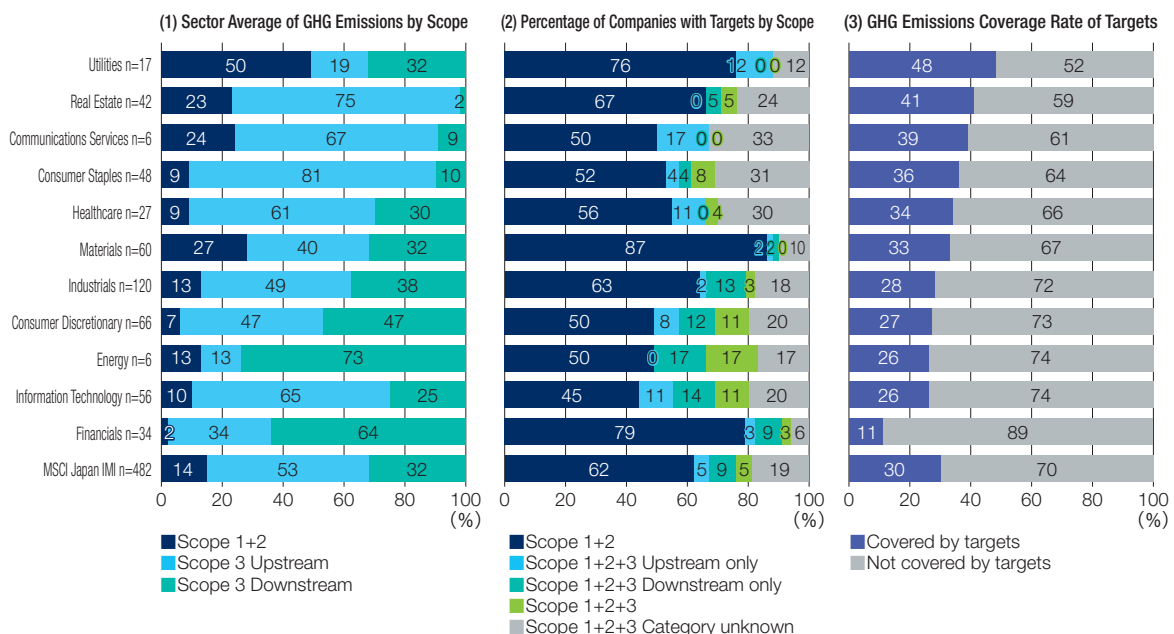
indicating a common trend.

On the other hand, there were also some distinctive differences. First, the second highest emissions coverage rate among Japanese companies was in the real estate sector, whereas it was in the materials sector for the developed-market companies and emerging-market companies. Emissions coverage in the healthcare sector was toward the top for Japanese companies and emerging-market companies but low for developed-market companies.

One likely factor behind these variations in emissions coverage rates is that, even though the proportion of each company's GHG emissions from Scope 3 is relatively large, there tends to be a high percentage of companies whose disclosure of GHG reduction targets covers only up to Scope 1+2. This is why, as seen in financials, sectors with a markedly high percentage of GHG emissions from Scope 3 have considerably low emissions coverage rates.

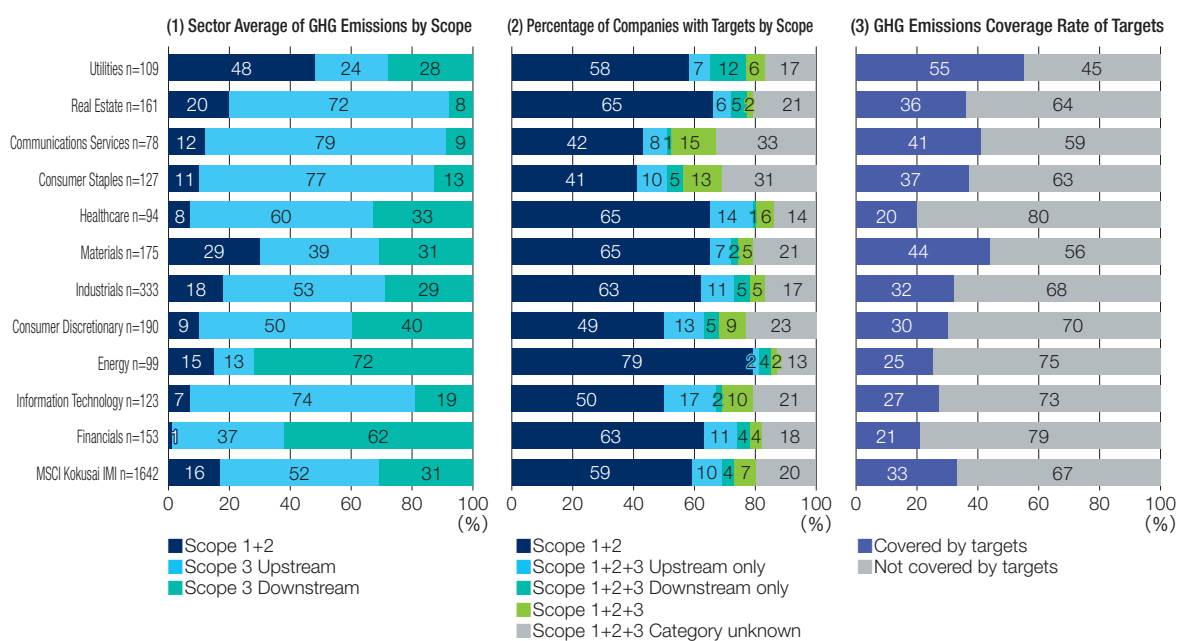
The MSCI Target Score Card reveals that the GHG emissions coverage rate of companies' GHG reduction targets depends greatly on the status of their Scope 3 target disclosures. For this reason, as more progress is made in Scope 3 target disclosures, it is expected that targets will become more aligned with the actual state of GHG emissions.

Figure 1. GHG Emissions and Reduction Targets by Japanese Companies



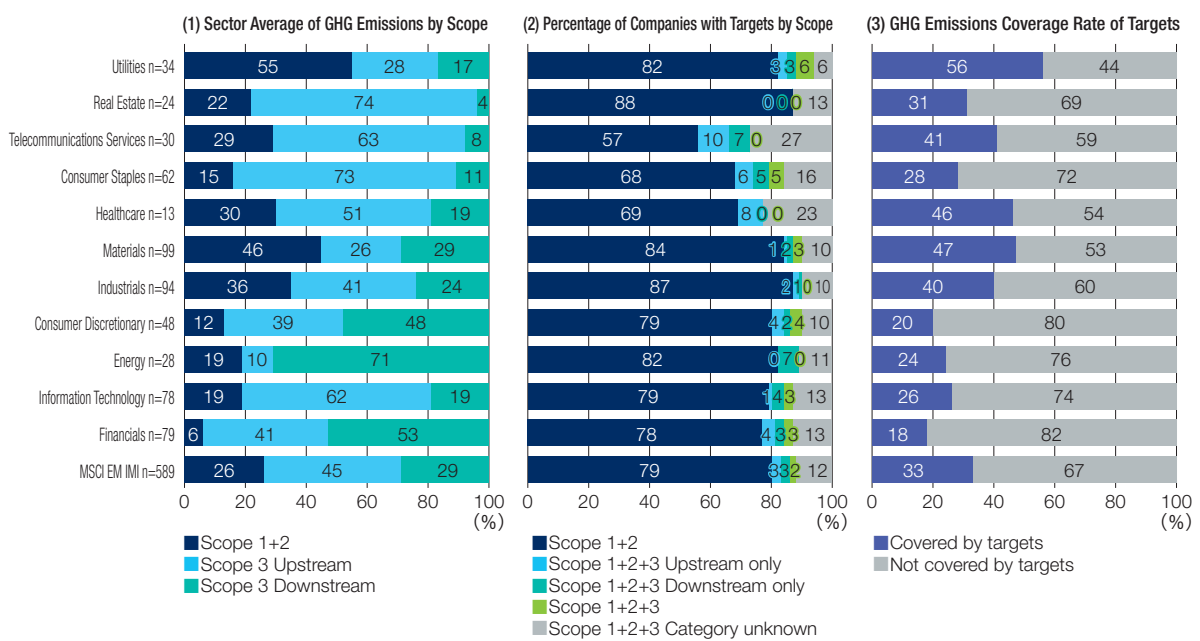
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Figure 2. GHG Emissions and Reduction Target by Developed-market Companies



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Figure 3. GHG Emissions and Reduction Target by Emerging-market Companies



(Note) In all three figures, the categories in the middle graph are defined as companies that have set targets to the following extents.

- Scope 1+2: Scopes 1 & 2. Also includes companies with targets in Scope 1 or Scope 2 only.
- Scope 1+2+3 Upstream only: In addition to Scope 1+2, also has targets in all or some of the 8 upstream categories of Scope 3. Also includes companies with targets in Scope 3 Upstream only.
- Scope 1+2+3 Downstream only: In addition to Scope 1+2, also has targets in all or some of the 7 downstream categories of Scope 3. Also includes companies with targets in Scope 3 Downstream only.
- Scope 1+2+3: In addition to Scope 1+2, also has targets in all or some of the upstream and downstream categories of Scope 3. Also includes companies with targets in Scope 3 Upstream and Downstream only.
- Scope 1+2+3 Category unknown: Targets are set for Scope 1+2+3, but the extent is not clearly stated. Also includes companies with targets in Scope 3 only but the extent is not clearly stated.

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Analysis of Portfolio’s Implied Temperature Rise

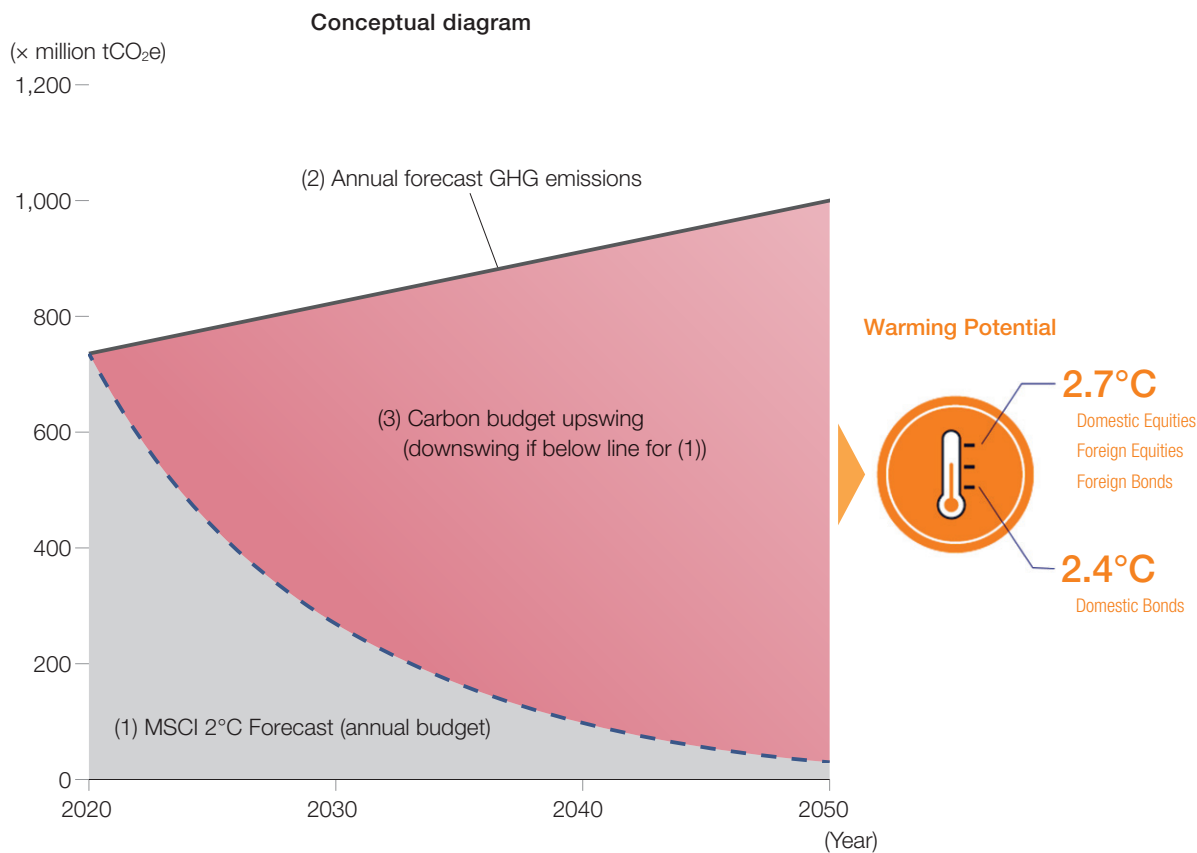
MSCI’s Implied Temperature Rise (ITR) was used for this analysis. It evaluates the extent of potential to cause global warming from a target company’s forecast greenhouse gas (GHG) emissions, shown as an increase in temperature.

In the calculation of temperature increase potential, (1) the carbon budget¹ available to limit temperature rise to 2°C announced by the Intergovernmental Panel on Climate Change (IPCC) is allocated in fair share based on factors such as the company’s current revenue and carbon intensity levels. (2) The company’s forecast future GHG emissions are calculated from its current GHG emissions and declared GHG emissions reduction targets, and the difference from (1) is calculated on an emissions basis. After dividing that difference by the allocated carbon budget to determine (3)

to what extent emissions exceed or are below budget, (3) is multiplied by (1) and then, by multiplying the Transient Climate Response to Cumulative Emissions (TCRE) factor² based on scientific findings, the estimated GHG emissions are converted into a measurement of temperature increase (Figure 1).

The results of the analysis showed that the temperature rise potential across GPIF’s portfolio was 2.7°C for domestic equities, 2.4°C for domestic bonds, 2.7°C for foreign equities, and 2.7°C for foreign bonds (Figure 1). In all asset classes, forecast temperature rise exceeds 2°C. Looking at trends by asset class, temperature rise potential is relatively low for domestic bonds, while potential in all three other asset classes is at around the same level.

Figure 1. Temperature Rise Potential in GPIF Portfolio



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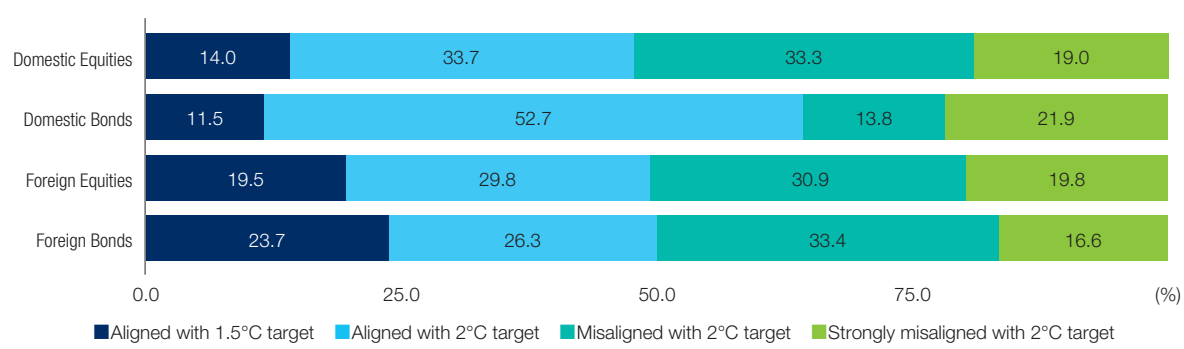
1 Carbon budget is the upper limit of how much GHG emissions would be allowed until the temperature increase reaches a certain value due to global warming.
2 This factor indicates the contribution to temperature rise of the release of 1Gt of GHG emissions.

We also checked the status of companies in each asset class (Figure 2). This analysis classifies each company into four categories according to its temperature rise potential: “aligned with 1.5°C target,” “aligned with 2°C target,” “misaligned with 2°C target,” and “strongly misaligned with 2°C target,” and shows the percentage of companies in each category³. The results of the analysis showed that the ratio of companies with a temperature rise potential of 2°C or below, namely, companies classified as “aligned with 1.5°C target” or “aligned with 2°C target,” was 47.7% for domestic equities, 64.2% for domestic bonds, 49.3% for foreign equities, and 50.0% for foreign bonds. The ratio for domestic equities was slightly higher than those for the other three asset classes, which were all around 50%. However, because each

asset class had a smattering of companies classified as “strongly misaligned with 2°C target,” with their potential rises spread widely from over 3.2°C to 10°C, the overall result is higher than 2°C (Figure 3 shows the distribution for domestic equities).

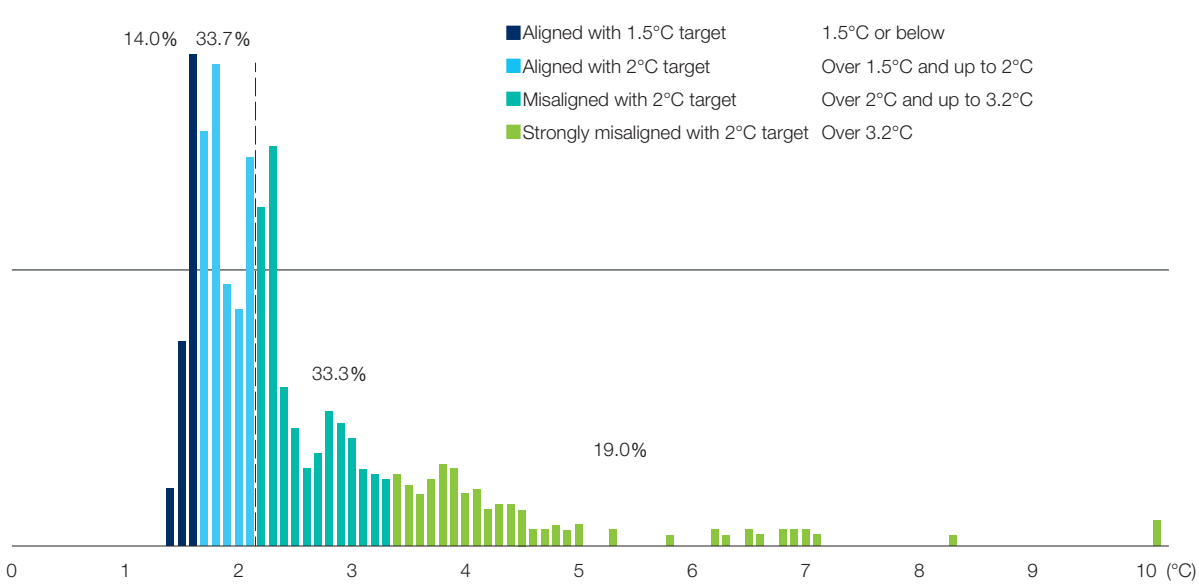
The ratio of “aligned with 1.5°C target” for foreign equities and foreign bonds is larger than that for domestic equities. The Target Score Card analysis in the previous section shows that the rate at which reduction targets of developed-market companies cover GHG emissions is, on the whole, greater than that of Japanese companies. Because developed-market companies account for many of those foreign equities and bonds, this is generally consistent with the results obtained for temperature rise potential.

Figure 2. Temperature Rise Potential in GPIF Portfolio by Category (Only for issues of companies with available data)



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Figure 3. Company Distribution of Global Warming Potential of Domestic Equity Portfolio



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³ These percentages do not include companies that are not included in evaluations and whose temperature rise potential has not been evaluated.

Analysis of Risks and Opportunities Using Climate Value-at-Risk

Climate Value-at-Risk (CVaR) is a method of measuring how climate policy changes and disasters caused by climate change impact corporate value. It is an integrated approach that assesses both the risks and opportunities vis-à-vis corporate value stemming from climate change.

CVaR Analysis by Climate Scenario

GPIF conducts climate-change risk analysis on our portfolio in line with the TCFD recommendations. CVaR comprises “transition risks,” which combine “technology opportunities” that indicate income opportunities made possible from technologies that have a competitive advantage under tightened regulations, and “policy risks” that indicate the impact from greenhouse gas (GHG) emission regulations, and “physical risks,” which combines the opportunities and risks from the impact of changes in the natural environment and disasters caused by climate change.

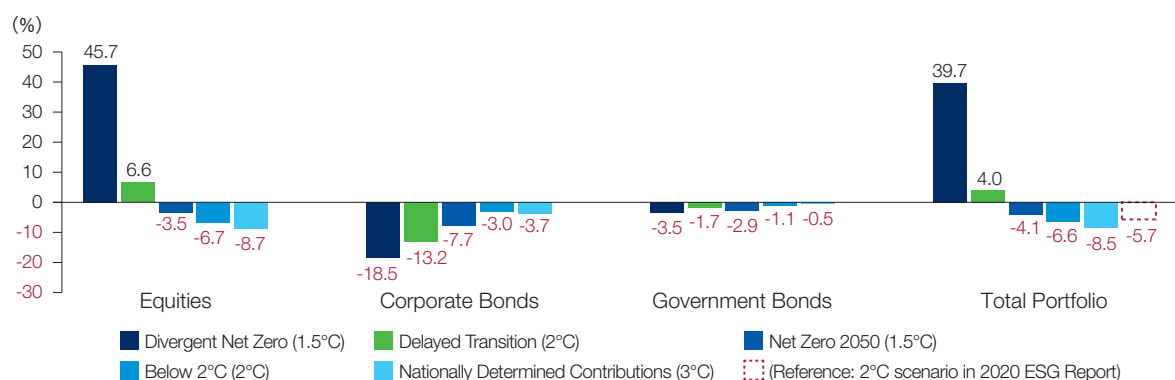
Following the ESG Report 2020, we made changes to our analysis models in this report. The major change made to the model this fiscal year was the reflection of the climate scenarios announced in June 2021 by the Network of Central Banks and Supervisors for Greening the Financial System (NGFS), which is an international network of central banks and financial supervisory authorities that considers responses to climate change risk from a financial supervision viewpoint

(Please refer to Page 54 for details of the NGFS climate scenarios).

The results of CVaR vary significantly depending on the climate scenario adopted. In this section, to identify the overall trends of each scenario, we calculated Aggregated CVaR, combining the technology opportunities, policy risks, and physical risks, based on portfolio data as of March 31, 2022. Then, after dividing this into the four categories of “equities,” “corporate bonds,” “government bonds,” and “total portfolio,” we compared the analysis results of five climate scenarios, namely “Net Zero 2050,” “Divergent Net Zero,” “Below 2°C,” “Delayed Transition,” and “Nationally Determined Contributions (NDCs)” (Figure 1). To assist with understanding the characteristics of the scenarios, the temperature increase range defined by MSCI is provided next to the name of each scenario. For example, the Net Zero 2050 scenario shows that the scenario is consistent with the 1.5°C pathway.

Divergent Net Zero and Delayed Transition, which are

Figure 1. Comparison of Aggregated CVaR by Portfolio



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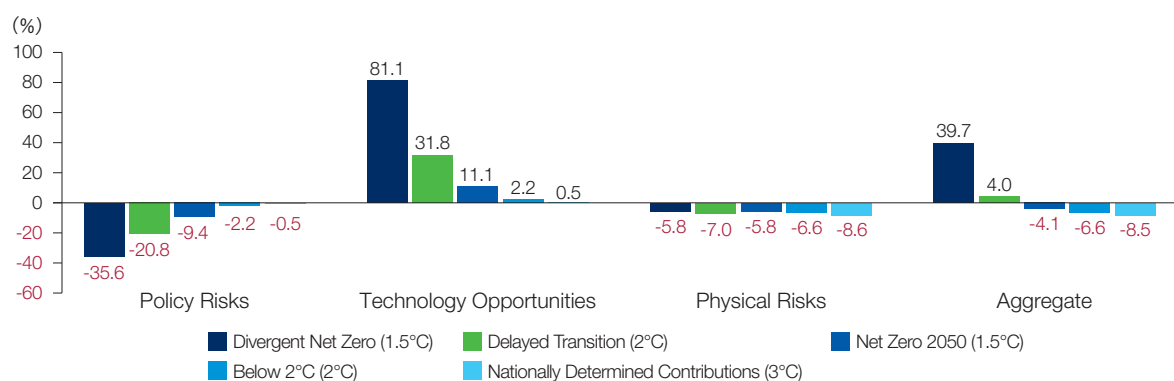
classified as disorderly scenarios, are seen as having a large positive impact in the equities category and a large negative impact in the corporate bonds category, with the overall net impact on the portfolio being positive. Comparing the other three scenarios, similarly to the previous fiscal year's model, in the corporate bonds category, the risks of temperature rise-curbing scenarios are great, while on the other hand, in the equities and total portfolio categories, the greater the curbing of temperature rise in the scenario, the smaller the risks became. This fiscal year, we conducted CVaR analysis on government bonds for the first time. The characteristics in this category were generally similar to those of the corporate bonds. For the total portfolio, there was no major difference between this fiscal year's Below 2°C scenario (-6.6%) and the data calculated for the 2°C scenario in the 2020 ESG Report (AIM/CGE)¹ (-5.7%).

Next, we categorized the aggregate CVaR for the total portfolio from the previous section into the three individual CVaR, namely policy risks, technology opportunities, and physical risks, and conducted a comparative analysis for each climate scenario (Figure 2). In Divergent Net Zero and Delayed Transition, which are classified as disorderly scenarios, policy

risks presented large risks, and technology opportunities showed a major positive impact, the result of which was a net positive "aggregate" impact. Comparing the other three scenarios, Net Zero 2050, Below 2°C, and NDCs, we found that, the scenarios with the largest curbing of temperature rise had larger policy risks. On the other hand, technology opportunities were found to have a larger positive impact the greater the curb on temperature rise in the scenario. These results are likely due mainly to the fact that the Net Zero 2050 scenario is one of curbing temperature rise through the implementation of stringent climate policies and the achievement of technological innovations. Further, the scenarios with the greater curbing of temperature rise resulted in smaller physical risks, and, as a result, in the aggregate category, the scenarios with larger curbing of climate rise generally involved smaller risks.

Based on the results of these various analyses, it could be concluded that there is a high chance that initiatives to curb temperature rise will result in more technology opportunities and fewer physical risks, leading to a fall in aggregate risk for the total portfolio.

Figure 2. Comparison of CVaR by Scenario



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¹ AIM-CGE (Asia-Pacific Integrated Model/Computable General Equilibrium Model) is a model developed by Japan's National Institute for Environmental Studies (NIES) and others.

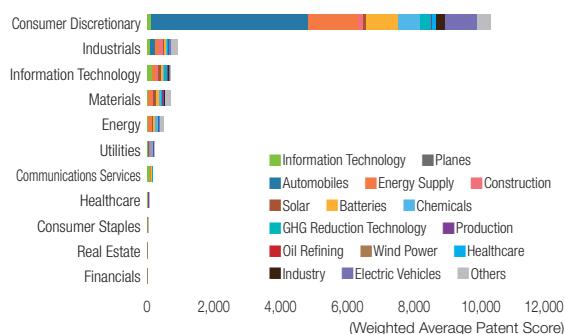
Technology Opportunities: Remarkably high scores for domestic equities

Here, we investigate the patent scores used to calculate technology opportunities for companies included in GPIF’s equity and corporate bond portfolios. While analysis results are affected by the amounts invested in individual companies, the portfolio at the time of this analysis is generally in line with the policy asset mix. As such, in terms of equities, the portfolios do not deviate significantly from policy benchmarks. The patent score calculation totals all low-carbon technology patents held by a given company and reflects any change in the number of such patents². Compared with the previous year, despite there being no major change in the composition, patent scores have increased significantly in all asset classes. In particular, the patent score of the domestic equity portfolio increased substantially than the other asset classes, with domestic companies in the automotive and energy supply

sectors scoring exceptionally high.

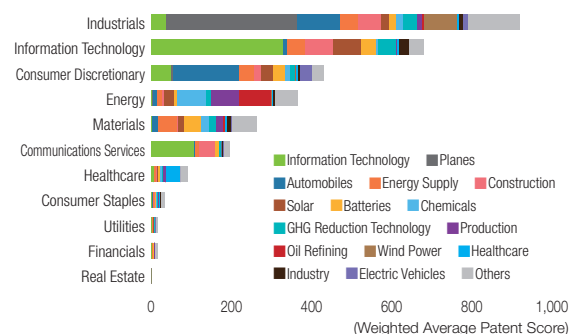
Looking at patent scores by sector, the consumer discretionary sector, which includes automotive manufacturers, scored markedly higher compared with other sectors in the domestic equity and domestic corporate bond portfolios. Within these sectors, “automobiles” had the highest patent scores, followed by “energy supply” (Figure 1 & 3). Meanwhile, in the case of foreign equities and foreign corporate bonds, the scores for industrials are the highest, with patents related to planes major contributions. In the information technology and industrials sectors, “information technology” scored highly, while “automobiles” scored highly in the consumer discretionary sector, similar to domestic equities and bonds (Figure 2 & 4).

Figure 1. Technology Opportunities: Domestic Equity Portfolio



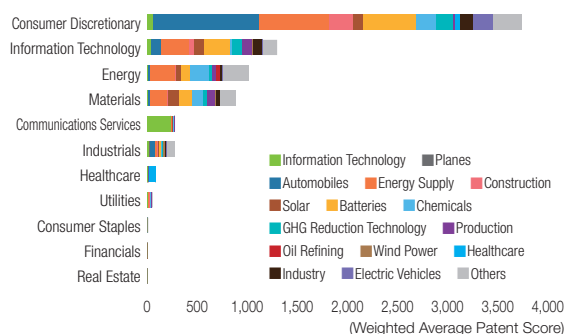
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Figure 2. Technology Opportunities: Foreign Equity Portfolio



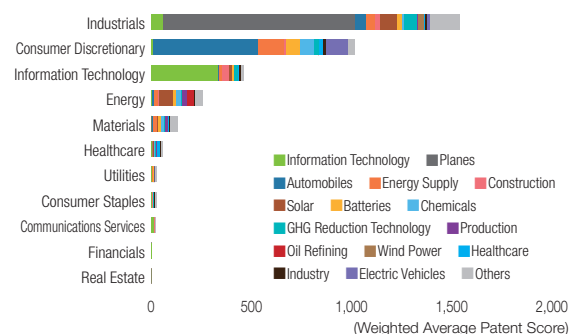
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Figure 3. Technology Opportunities: Domestic Corporate Bond Portfolio



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Figure 4. Technology Opportunities: Foreign Corporate Bond Portfolio



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² The evaluation of patent scores is based on “forward citations,” which is the number of patents cited in other parties’ patent applications, “backward citations,” which is the number of other parties’ patents cited when filing one’s own patent application, “market coverage,” or the total GDP of countries to which the patent application was filed, and the number of tagged CPC patent groups as “cooperative patent classification (CPC) coverage.” Please refer to Analysis of Climate Change-Related Risks and Opportunities in the GPIF Portfolio (a supplementary guide to the ESG Report 2021) for details.

Policy Risks: Overall, risks were large in the energy, utilities, and materials sector

For policy risks, which, along with technology opportunities, form part of transition risks, we conducted analysis based on the (1) Net Zero 2050 scenario. Similar to the previous fiscal year, the analysis looked mainly at four asset classes in GPIF's portfolio: domestic corporate bonds, foreign corporate bonds, domestic equities, and foreign equities. The risks in Scope 1 & 2, Scope 3, and total risks were analyzed for the major industry sectors in each asset class. Changes from the previous fiscal year were also analyzed (Figures 1-4).

For overall policy risk CVaR, including Scope 3, results for domestic equities showed that there were greater risks in the utilities sector (which includes electric power and other companies), the energy sector (which includes companies such as fossil fuel mining companies), and the materials sector, while risks in the healthcare, communications services, and financial sectors remain low. This followed a similar trend to the previous fiscal year. In terms of change from the previous fiscal year across all sectors, risks in the energy sector decreased by 4.2 percentage points. Stocks in the energy sector have relatively high policy risks,

which means potential for the sector's risk to change significantly due to changes in individual stocks. These individual stock-related factors are likely to be behind this result. Meanwhile, Scope 3 risks tend to be smaller than those of Scopes 1 & 2 in all sectors. This is due to the fact that, although absolute Scope 3 greenhouse gas emissions are generally large, this is not necessarily the case when companies' assumed burden rates are taken into account. By sector, risks in the utilities and energy sectors remained high, showing a similar trend to Scope 1 & 2.

Foreign equities showed the same trend as the previous fiscal year, with risks in the utilities, energy, and materials sectors remaining high. In changes from the previous fiscal year, risks in the energy sector also decreased in a similar trend to domestic equities.

In the corporate bond analysis, similarly to equities, the three sectors with the highest risks remain the utilities, energy, and materials, both domestically and overseas. In changes from the previous fiscal year, there was a decrease in risks in the materials sector.

Figure 1. Policy Risk: Domestic Equity Portfolio (%)

Sector	Policy Risk			Change from previous fiscal year (percentage points)
	CVaR	Scope 1+2	Scope 3	
Healthcare	-2.0	-1.1	-0.9	0.1
Communications Services	-2.5	-1.4	-1.0	-0.2
Financials	-2.6	-1.1	-1.6	0.1
Information Technology	-2.7	-1.6	-1.2	0.2
Real Estate	-5.2	-3.1	-2.2	0.4
Consumer Discretionary	-12.3	-2.7	-9.5	0.3
Consumer Staples	-12.5	-7.2	-5.3	0.1
Industrials	-13.2	-8.5	-4.7	-1.7
Materials	-38.8	-31.7	-7.1	0.8
Energy	-82.4	-40.9	-41.5	4.2
Utilities	-89.3	-58.2	-31.2	-2.5

(Note) Changes from the previous fiscal year are changes in CVaR for policy risks from the previous fiscal year calculated for the same model/scenario.

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Figure 3. Policy Risk: Domestic Corporate Bond Portfolio (%)

Sector	Policy Risk			Change from previous fiscal year (percentage points)
	CVaR	Scope 1+2	Scope 3	
Financials	-0.1	0.0	0.0	0.0
Communications Services	-0.1	0.0	0.0	0.0
Real Estate	-0.1	-0.1	-0.1	0.0
Information Technology	-0.2	-0.1	-0.1	-0.1
Healthcare	-0.3	-0.2	-0.1	0.2
Consumer Staples	-1.1	-0.7	-0.4	-0.3
Consumer Discretionary	-2.1	-0.2	-1.8	0.3
Industrials	-2.3	-2.0	-0.4	-1.2
Materials	-17.1	-16.1	-0.9	5.3
Energy	-38.7	-17.4	-21.3	0.2
Utilities	-49.4	-47.5	-1.9	-1.2

(Note) Changes from the previous fiscal year are changes in CVaR for policy risks from the previous fiscal year calculated for the same model/scenario.

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Figure 2. Policy Risk: Foreign Equity Portfolio (%)

Sector	Policy Risk			Change from previous fiscal year (percentage points)
	CVaR	Scope 1+2	Scope 3	
Information Technology	-0.9	-0.5	-0.4	0.2
Financials	-1.9	-1.3	-0.6	0.1
Healthcare	-1.9	-1.2	-0.7	0.1
Communications Services	-2.3	-1.9	-0.4	0.2
Real Estate	-2.6	-2.1	-0.5	1.0
Consumer Discretionary	-4.0	-1.5	-2.4	0.4
Consumer Staples	-8.3	-5.7	-2.6	0.0
Industrials	-9.2	-7.7	-1.5	0.1
Materials	-29.8	-23.5	-6.3	2.7
Utilities	-43.1	-37.8	-5.3	2.1
Energy	-45.5	-29.7	-15.8	4.3

(Note) Changes from the previous fiscal year are changes in CVaR for policy risks from the previous fiscal year calculated for the same model/scenario.

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Figure 4. Policy Risk: Foreign Corporate Bond Portfolio (%)

Sector	Policy Risk			Change from previous fiscal year (percentage points)
	CVaR	Scope 1+2	Scope 3	
Financials	-0.1	0.0	0.0	0.0
Communications Services	-0.4	-0.4	-0.1	0.0
Real Estate	-0.1	-0.1	0.0	0.2
Information Technology	-0.1	0.0	0.0	0.0
Healthcare	-0.2	-0.1	0.0	0.1
Consumer Staples	-1.5	-1.2	-0.3	0.8
Consumer Discretionary	-1.5	-0.5	-1.0	0.2
Industrials	-1.9	-1.8	-0.1	1.9
Materials	-7.7	-6.8	-1.0	5.7
Energy	-9.9	-7.3	-2.6	-1.4
Utilities	-17.9	-17.3	-0.5	5.7

(Note) Changes from the previous fiscal year are changes in CVaR for policy risks from the previous fiscal year calculated for the same model/scenario.

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Physical Risks: Coastal flooding risk notable, risk of tropical cyclones also up

Finally, we conducted an analysis of the physical risks³ in GPIF’s portfolio. In the physical risk analysis, we examined potential deterioration in corporate revenues arising from asset damage and productivity declines caused by climate change-induced extreme weather events, such as floods and heat waves. We also analyzed the potential for increased revenues resulting from such extreme weather. For example, improvements in operating rates and reductions in heating costs in cold regions due to rising temperatures would represent positive results in the physical risk analysis.

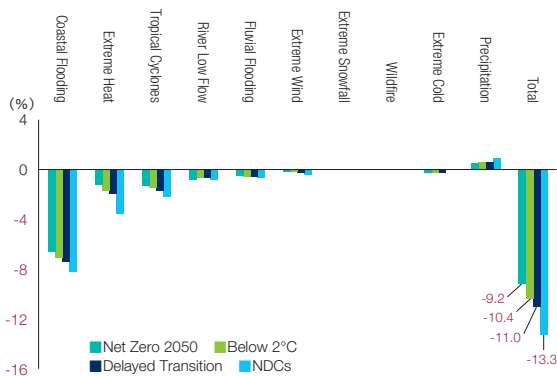
This fiscal year, we added “river low flow” and “wildfire” to the natural disasters included in the risk analysis. For “river low flow,” we assumed that thermal power plants close to rivers and hydropower plants are exposed to the risk of falling river levels and, using a model for decreases in water volumes and accompanying power losses, calculated the change in costs. For “wildfire,” we estimated factors such as weather conditions,

probability of fires starting, probability of impact on specific locations, fire duration, and fire damage to assets to determine the wildfire risk to assets.

Further, this fiscal year, we trialed analyses based on multiple NGFS scenarios. Specifically, we used the four scenarios of Net Zero 2050, Below 2°C, Delayed Transition, and NDCs (Please refer to Page 54 for details of individual scenarios).

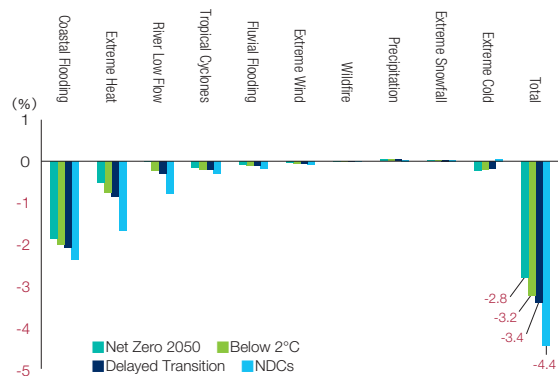
In this section, we first compared the risks of these four scenarios in terms of the damage from each type of natural disaster for each asset portfolio (Figures 1-4). The same trends were observed for all asset portfolios from almost all types of natural disaster, with no marked difference. However, we did find that the risks became smaller in the order of NDCs, Delayed Transition, Below 2°C, and Net Zero 2050. In other words, this suggests that the more initiatives progress to achieve high targets against climate change, the smaller the physical risks will be for each asset class in the portfolio.

Figure 1. Physical Risks by Scenario: Domestic Equity portfolio



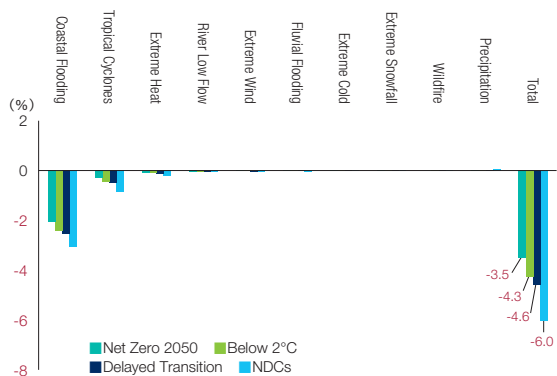
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Figure 2. Physical Risks by Scenario: Foreign Equity Portfolio



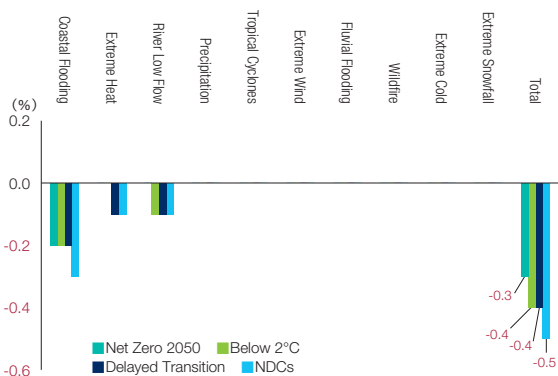
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Figure 3. Physical Risks by Scenario: Domestic Corporate Bond Portfolio



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Figure 4. Physical Risks by Scenario: Foreign Corporate Bond Portfolio



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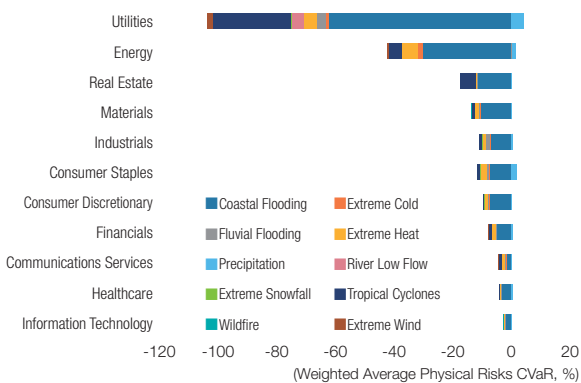
³ This section refers to “physical risks,” but as stated in the main text, the positive and negative effects on corporate earnings have been offset.

Next, we conducted an analysis of the physical risks in each portfolio asset class by sector based on the Net Zero 2050 scenario (Figures 5 to 8). As was the case in the previous fiscal year, the trends observed differed from policy risk trends. First, in the domestic equity portfolio, the utilities and energy sectors were shown to have significant physical risks in addition to policy risks, followed by the real estate sector. On the other hand, the risk in the financials sector, which was high in the previous fiscal year's analysis, has decreased due to an increase in the ratio of investment in companies with relatively low physical risks. In the foreign equity portfolio also, similar to the domestic equity portfolio, the utilities, energy, and real estate sectors were shown to have high physical risks. The causes of these high risks are coastal flooding, tropical cyclones, and extreme heat. In the previous fiscal year's analysis, the risk of tropical cyclones was relatively small, but this fiscal year, we were able to assess the risks in a form that better approximates actual

damage by updating the vulnerability factors in the tropical cyclone hazard model. For this reason, risks in the North American and Southeast Asian regions increased. Regarding coastal flooding as well, due to improvements in flood protection data, the risk models for urban areas and non-urban areas have been differentiated, but the impact of this was limited.

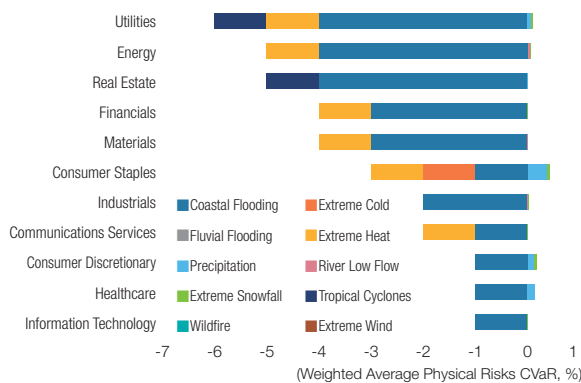
For domestic corporate bonds, risks were found to be highest in the utilities, energy, and materials sectors, while for foreign corporate bonds, the consumer staples, real estate, and consumer discretionary sectors had the highest risk. Overall, coastal flooding risk was high, while in the consumer staples sector of the foreign corporate bonds portfolio, the risk of precipitation was markedly high. For precipitation, a high risk coefficient was set for the retail industry, which is one constituent of the consumer staples sector. Thus a relatively high weighting of the precipitation in this sector may be a factor behind this result.

Figure 5. Physical Risks by Sector: Domestic Equity portfolio



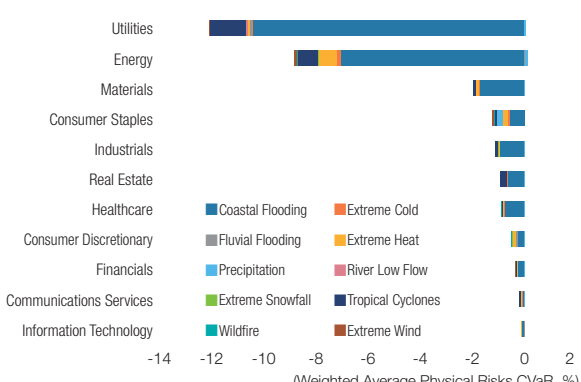
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Figure 6. Physical Risks by Sector: Foreign Equity Portfolio



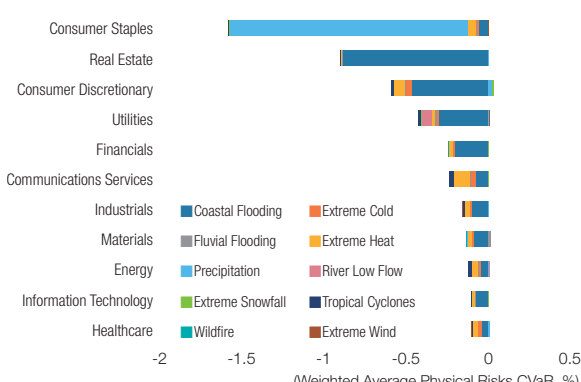
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Figure 7. Physical Risks by Sector: Domestic Corporate Bond Portfolio



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Figure 8. Physical Risks by Sector: Foreign Corporate Bond Portfolio



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Analysis of Government Bond Portfolio Using Sovereign Bond Climate Value-at-Risk

Understanding how the risks related to climate change will affect government bond prices is extremely difficult. However, if we consider the fiscal burden and other impacts from the response to climate change-related transition and physical risks, climate change risks do have the potential to affect GPIF's government bond portfolio through interest rate rises.

Analysis of Government Bond Portfolio Using Sovereign Bond Climate Value-at-Risk

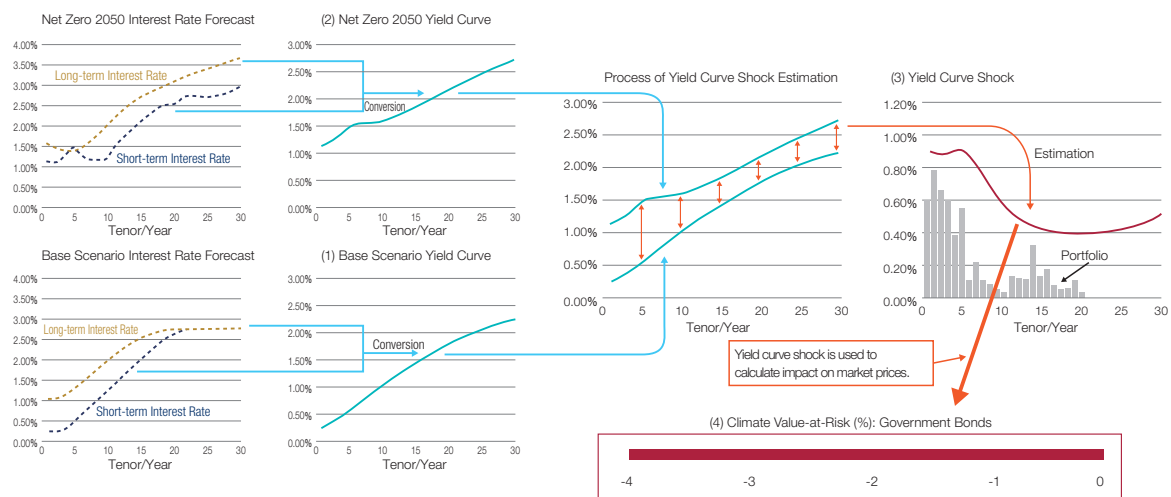
This section uses Sovereign Bond CVaR to analyze climate change risk to government bonds. This was done based on the question of how interest rates, which are a constituent of government bond prices, change in each of the various climate change response scenarios.

As an assumption to this analysis, we used the 30-year interest rate forecasts based on the NGFS framework and scenarios (Figure 1). Firstly, we produced (1) a 30-year yield curve to serve as the baseline scenario for the countries being analyzed, using the interest rate forecasts for the scenario that does not factor in the impact of climate change. Next, we adopted five of NGFS's six climate scenarios, namely "Net Zero 2050," "Below 2°C," "Divergent Net Zero," "Delayed Transition," and "Nationally Determined Contributions (NDCs)" as the scenarios to be compared with the base scenario (Please refer to Page 54 for details of the

individual scenarios). We then produced (2) 30-year yield curves for each scenario for the countries being analyzed, using the same method as (1).

After that, comparing (1) and (2), we estimated (3) yield curve shock, which indicates how much the interest rate forecasts would change when transition from the base scenario to each individual scenario is assumed. Next, using (3), we calculated (4) the price of the target countries' government bonds. Finally, comparison of (4) with the current prices of the same bonds indicates to what extent returns will increase or decrease (Figure 1). It should be noted that, while the chronic impact of changes in climate patterns has been factored into physical risks in each scenario to a certain extent, acute impacts, such as disasters caused by extreme weather events, have not been taken into account.

Figure 1. Conceptual Diagram of Calculation of CVaR of Government Bonds



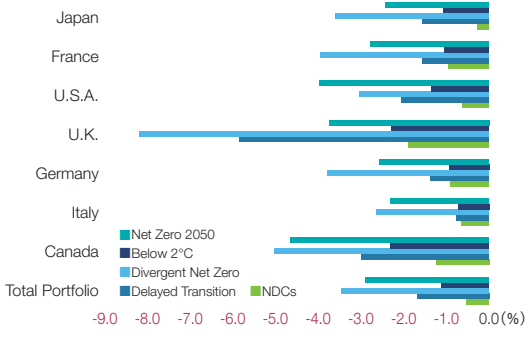
(Source) GPIF, Reproduced by permission of MSCI ESG Research LLC©2022.

Using the analysis method described above, we calculated and compared CVaR by country for the government bond portfolio as of March 31, 2022 (Figure 2). The comparison was conducted across eight categories—Japan, France, United States, United Kingdom, Germany, Italy, Canada, and total portfolio. In the Net Zero 2050 scenario, the CVaR of Canada, United States, and United Kingdom was calculated at a relatively high level. In the Divergent Net Zero and Delayed Transition scenarios, the United Kingdom's CVaR was markedly high in relative terms, followed by that of Canada. However, government bond CVaR is affected by the duration of the investment in bonds held. In other words, if the size of the yield curve shock is the same, it is possible to say that the longer the duration of a government bond, the larger the negative CVaR impact will be. However, it should be noted that the price risk is generated by two factors, namely the duration of the government bond and the size of the yield shock at maturity (for example, in the Net Zero 2050 scenario, the yield curve shock is greater in the short term in some countries).

Based on the above perspective, we conducted a comparison of three yield curve shocks, namely for one year (short-term), ten years (long-term), and 25 years (ultra-long-term) until maturity under the Net Zero 2050 scenario (Figure 3). Because yield curve shock is estimated from the difference in interest rates between the baseline scenario and the climate scenarios, we can compare the difference in interest rates for individual years (Figure 1). In the United States, for cases of one year until maturity, the yield curve shock is relatively large. This is because, in the period of the Net Zero 2050 scenario, of which is close to the present day, it is envisaged that the U.S. inflation rate will become relatively high. A similar trend was observed for the United Kingdom. On the other hand, in the other countries, yield curve shock tended to be the lowest for one-year periods until maturity. In Japan, the yield curve shocks were smaller compared to the other countries.

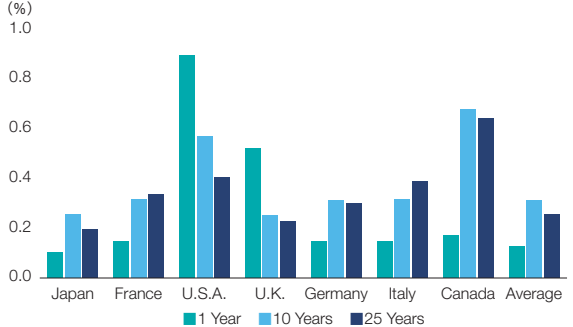
Next, we estimated the impact of yield curve shock on government bond prices (Figure 4). For convenience, we assumed zero-coupon bonds for each maturity period to approximate the impact of yield curve shock in the period until maturity and estimate the rate of decline in government bond prices. Figure 4 shows that the highest rate of decline was 16.1% in the price of 25-year Canadian government bonds. In this scenario, Canada had the greatest difference in interest rates over the 25 years until maturity. Longer discount periods are a factor in these results. From this simple simulation, it may be possible to summarize that, under specific climate scenarios, government bonds with longer maturity periods will be exposed to greater price risk.

Figure 2. CVaR of Government Bonds by Countries



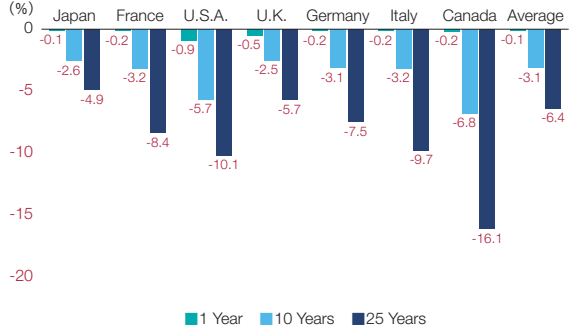
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Figure 3. Country-to-country Comparison of Yield Curve Shock (1-Year, 10-Year, and 25-Year Maturity)



(Note) The average is a simple average of 46 countries, including the above seven countries. (Source) GPIF, Reproduced by permission of MSCI ESG Research LLC©2022.

Figure 4. Country-to-country Comparison of Rate of Decline in Government Bond Prices (1-Year, 10-Year, and 25-Year Maturity)



(Note) The average is a simple average of 46 countries, including the above seven countries. (Source) GPIF, Reproduced by permission of MSCI ESG Research LLC©2022.

Evaluation of Alignment with SDGs

This section evaluates the extent to which the constituent companies in GPIF’s portfolio are aligned with the Sustainable Development Goals (SDGs) defined by the United Nations.

Evaluation of Alignment with SDGs

In previous sections, we analyzed the risks and opportunities in the context of climate change, but this section expands the discussion beyond climate change by evaluating the extent to which GPIF’s equity portfolio are aligned with the 17 Sustainable Development Goals (SDGs) defined by the United Nations.

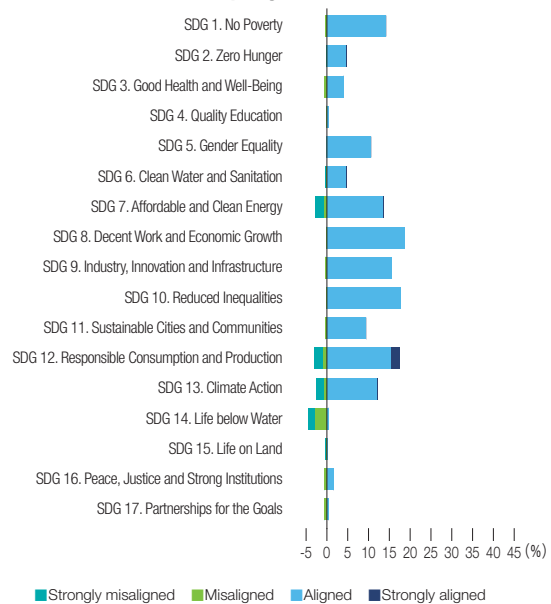
Alignment with the SDGs in this section is evaluated for each constituent company based on MSCI’s SDG Alignment data. Specifically, four elements of each constituent company are identified, namely, the positive and negative impacts of their products and services and the positive and negative impacts of their business activities on each of the SDGs. These results are then totalled, and those impacts are given a score from -10 to +10. Further, the companies are then assessed in five categories—“strongly aligned,” “aligned,” “neutral,” “misaligned,” and “strongly misaligned” depending on their score. Based on the results of the analysis and total obtained with the method described above, the extent to which the constituent companies of GPIF’s domestic equity and foreign equity portfolios correspond to each category (excluding “neutral”) is indicated for each individual SDG (Figure 1 & 2).

A comparison of these SDG alignment results revealed a number of distinctive characteristics for each goal.

Firstly, the percentage of companies that are “aligned” with Goal 5: Gender Equality was approximately 42% for constituent companies in the foreign equity portfolio, a significantly higher percentage than the approximately 11% of the constituent companies in the domestic equity portfolio. This is believed to reflect the proactive gender equality initiatives being pursued by overseas companies. Similarly, the percentage of companies that are “aligned” with Goal 8: Decent Work and Economic Growth was approximately 30% for constituent companies in the foreign equity portfolio, much higher than the approximately 19% of the constituent companies in the domestic equity portfolio.

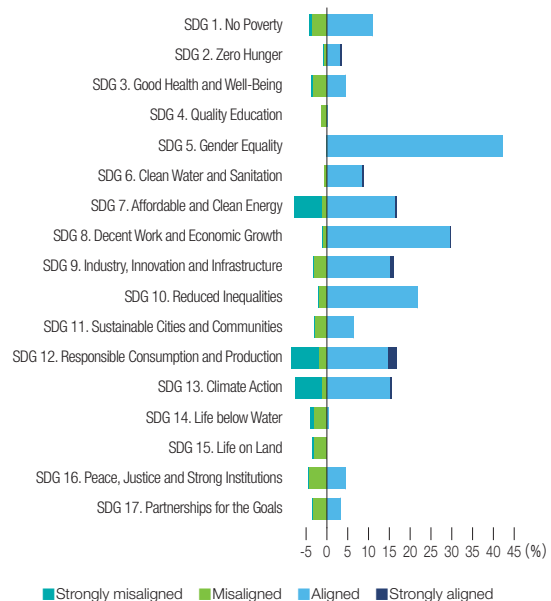
Further, when the percentages of companies categorized as “aligned” and “strongly aligned” with the other goals are combined, those percentages tended to be lower for the constituent companies in

Figure 1. Evaluation of Alignment with SDGs: Domestic Equity Portfolio



(Source) GPIF, Reproduced by permission of MSCI ESG Research LLC©2022.

Figure 2. Evaluation of alignment with SDGs: Foreign Equity Portfolio



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the domestic equity portfolio than those in the foreign equity portfolio. On the other hand, when the percentages of companies categorized as “misaligned” and “strongly misaligned,” for many of the goals, those percentages tended to be lower for the constituent companies in the domestic equity portfolio than those in the foreign equity portfolio.

Many of the companies in both the domestic and foreign portfolio were categorized as “neutral,” a trend that was particularly prevalent among Japanese companies. This could be interpreted as there being plenty of room for these companies to align with the SDGs as they move forward with their initiatives.

Column

Economic Impact of Corporate Activities on Individual SDGs

This section evaluated companies from the perspective of alignment with SDGs. All investors, including GPIF, want to measure the impact of companies' activities on the individual SDGs (“SDGs impact”) using a financial scale. Various attempts have been made to propose solutions to these needs, but at present, partly due to the small number of target companies, there are still many challenges in verifying trends in the overall portfolio. Accordingly, in this report, instead of evaluating the total portfolio, we present a brief introduction of some challenging initiatives that are currently being undertaken.

The analysis of SDGs impact totals the economic impact in three categories, namely natural capital, human capital, and produced capital. For example, natural capital consists of factors such as GHG emissions and atmospheric pollution.

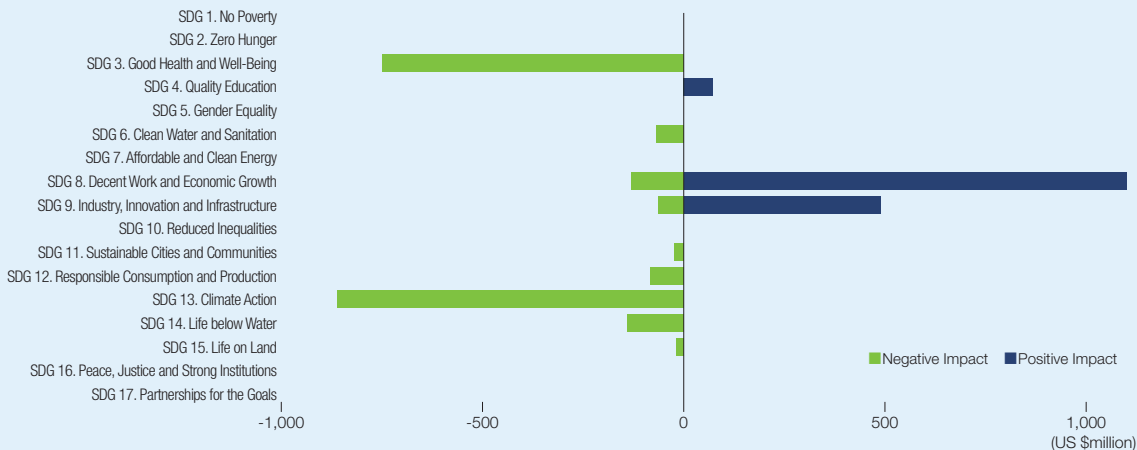
Because the targeted data differs for each constituent factor, the specific calculation method is explained using “atmospheric pollution” as an example. Firstly, we output the data that will form the foundation of the evaluation, such as wind speed and direction and atmospheric pollutants such as sulfur oxides. Next, we add in data such as population density and the costs of atmospheric pollution-related illness and calculate the economic

impact of atmospheric pollution from that company's business. From the economic impacts of each constituent element, the economic impact of natural capital is calculated and distributed proportionally to each of the relevant SDGs. For example, the economic impact of natural capital is distributed among the relevant SDGs from among Goals 3, 6, and 11-15.

The following is the example of one company's economic impact. The positive impact and negative impact are shown for each of the SDGs (Figure 3). For this company, both positive and negative impacts on “SDG 8. Decent Work and Economic Growth” and “SDG 9. Industry, Innovation and Infrastructure” are estimated.

These results suggest that corporate activities do not necessarily have only either a positive or negative impact on the SDGs. As mentioned at the top of this column, we are not yet at the stage of being able to use this information in analysis on a large scale, such as for the total GPIF portfolio. However, there are hints to be obtained from the examples of individual companies, and the calculation of the relationship between the SDGs and companies in the form of economic impact is an initiative that we hope to watch closely going forward.

Figure 3. Examples of SDGs Impact by Individual Goal



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Analysis of Businesses Contributing to Climate Change Action

As described in “Public- and Private-Sector Support for Achieving a Net-Zero Economy” (Pages 59-64), progress is being made on companies’ climate action initiatives. In evaluating companies’ initiatives, it is important to identify the extent to which companies’ business activities contribute to the transition to a green economy including climate action. FTSE Russell defines revenues from green businesses that contribute to climate action as “green revenues” and uses its Green Revenues Classification System to measure such revenues of listed companies. This system classifies business activities that fall under green revenues into ten green sectors (Energy Generation, Environmental Resources, Transport Equipment, Food & Agriculture, etc.) and further classifies them into 64 subsectors and 133 micro-sectors. It also evaluates the degree of positive impact of companies’ business activities on the environment at the micro-sector level and grades them as Tier 1, Tier 2, and Tier 3, with Tier 1 having the most positive impact. For example, in the Energy Generation sector, wind and solar power are classified as Tier 1 activities, defined as having the clearest, most marked benefit on the environment. Meanwhile, biogas is classified as a Tier 2 activity, defined as having a positive environmental impact, albeit a more limited one than Tier 1. Tier 3 activities, which include nuclear power, are considered to be neutral overall, in that their environmental benefits are potentially accompanied by material environmental risks. (Figure 1).

Based on these classifications, we analyzed the percentage of green revenues to all business revenues (“green revenues ratio”) of companies covered by the MSCI ACWI. The green revenues ratios of each company were weighted by market capitalization to calculate the green revenue ratios for each country and tier (Figure 2). Among the G7 nations, Germany had the highest green revenue ratio at around 13%. The country had high proportions of Tier 1 and Tier 2 green revenues. Japan’s green revenue ratio was around 10%, with a high proportion found in Tier 1. This is because revenues from (strong) hybrid vehicles, in which Japan’s automotive manufacturers are strong, are currently classified in Tier 1. However, it should be noted that this evaluation may change, given recent moves in Europe for hybrid vehicles to no longer be considered as green revenue.

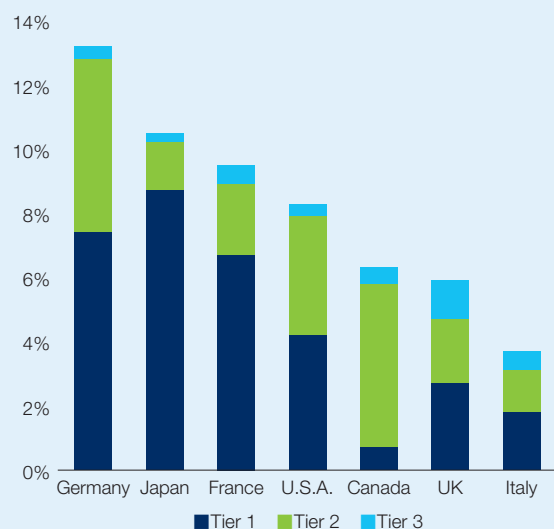
It should be noted that this analysis was conducted based on data that relies on limited information sources. Indeed, information disclosure by companies regarding their green revenues is limited, and in cases where disclosure is insufficient, revenues have been estimated using additional, non-revenue data. Also for the sake of identifying green revenue opportunities for companies in relation with the climate crisis, it is hoped that information disclosure about companies’ green revenues will increase and that understanding of the opportunities for companies of the green economy will advance.

Figure 1. Green Revenue Classification in Energy Generation Sectors

Sector	Subsector	Micro-sector	Tier
Energy Generation	Bio Fuels	Bio Fuels (General)	Tier3
		Bio Gas	Tier2
		Bio Mass (Grown)	Tier3
		Bio Mass (Waste)	Tier2
	Cogeneration	Cogeneration (General)	Tier2
		Cogeneration (Biomass)	Tier1
		Cogeneration (Renewable)	Tier1
		Cogeneration (Gas)	Tier2
	Fossil Fuels	Fossil Fuels (General)	—
		Clean Fossil Fuels	Tier1
	Geothermal	Geothermal	Tier1
	Hydro	Hydro (General)	Tier2
		Large Hydro	Tier2
		Small Hydro	Tier1
	Nuclear	Nuclear (General)	Tier3
	Ocean & Tidal	Ocean & Tidal (General)	Tier1
	Solar	Solar (General)	Tier1
	Waste to Energy	Waste to Energy (General)	Tier1
	Wind	Wind (General)	Tier1

(Note) Classifications based on Green Revenues Classification System (GRCS)
 (Source) Prepared by GPIF based on data from FTSE Russell

Figure 2. Green Revenue Ratio by Country



(Note) Only results for constituents of MSCI ACWI in G7 countries as of March 31, 2021 are shown.
 (Source) Prepared by GPIF based on data from FTSE Russell

Editor's Note

The Challenges of Balancing Sophisticated Analysis with Ease of Reading and Broadening the Scope of Analysis

This is GPIF's fifth ESG Report since it was first published in 2018 – one year after we began passive investment based on ESG indexes. The reason we started producing ESG Reports was that we believe that the effect of ESG investments cannot be measured by short-term investment performance alone; in addition to risk and return, many other different aspects need to be evaluated. Moreover, investment methods and ESG rating methods for ESG investments are still in their infancy, and we believed that, even after the start of investment, they should be constantly reviewed.

For GPIF, which makes investments that look several decades into the future, the approximately five years since we selected ESG indexes could be seen as the very early stage of investment. Even so, a certain level of improvement has started to emerge in investment performance and the portfolio's ESG rating in that time. Other than the direct effects of GPIF's investment behavior, we are seeing positive moves toward the expansion of companies subject to ESG rating, improvements in ESG rating methods, and the strengthening of index governance by index providers, thanks to the hard work of the ESG ratings agencies, index providers and our external asset managers. To ensure that these moves become firmly entrenched, GPIF's ESG team will continue to cooperate with all parties concerned.

On the other hand, we also have some concerns from the perspective of information disclosure in the ESG Report. For this year's report, the ability to analyze the portfolio's climate change risks and revenue opportunities for equities, corporate bonds and government bonds all at once with the same scale, based on the highly objective scenarios used in stress testing by central banks, has been a major success. On the other hand, analysis methods are becoming more

sophisticated every year, and we worry that the contents may have become more difficult to understand for our stakeholders, including the Japanese public. Creating a balance between sophisticated analysis and ease of reading will be a major challenge going forward. We are considering the disclosure of information in easy-to-understand formats such as YouTube videos in the future.

Although GPIF does not conduct investment with the purpose of creating social impact, a growing number of people are interested in what kind of secondary effects are being created by our investment behavior. In this report, we disclosed for the first time the extent to which renewable energy projects in domestic infrastructure investments are having an effect on the reduction of greenhouse gas emissions, but this covers only a very small portion of the GPIF portfolio. We hope to gradually increase this kind of analysis in the future.

In future, it is set to become mandatory for companies in Japan to disclose information about human capital in annual securities reports. Once companies start to enhance both the quantity and quality of their disclosures, the onus will be on investors to make proper use of that disclosed information. Doing so will provide an incentive for more companies to disclose information, creating a virtuous cycle in capital markets. Compared with our information disclosures related to the environment (E), GPIF has been slower in social (S) and governance (G) disclosures. We hope to improve this situation in terms of the breadth of our information disclosures and the depth of analysis.

SHIOMURA Kenji

Editor-in-Chief of ESG Report (ESG Team Head)

Annual Report 2021



ESG Illustrated



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Investment Principles

1

Our overarching goal should be to achieve the investment returns required for the public pension system with minimal risks, solely for the benefit of pension recipients from a long-term perspective, thereby contributing to the stability of the system.

2

Our primary investment strategy should be diversification by asset class, region, and timeframe. While acknowledging fluctuations of market prices in the short term, we shall achieve investment returns in a more stable and efficient manner by taking full advantage of our long-term investment horizon. At the same time, we shall secure sufficient liquidity to pay pension benefits.

3

We formulate the policy asset mix and manage and control risks at the levels of the overall asset portfolio, each asset class, and each investment manager. We employ both passive and active investments to attain benchmark returns (i.e., average market returns), while seeking untapped profitable investment opportunities.

4

Based on the idea that sustained growth of companies being invested in and the market as a whole is required for long-term investment returns on assets under management, we promote investments that take into account the non-financial elements of environmental, social and governance (ESG), in addition to financial elements, with a view to ensuring long-term returns for the benefit of pension recipients.

5

We promote a variety of activities (including ESG-conscious initiatives) that fulfill our stewardship responsibility of promoting long-term aims and sustainable growth of our investments and the market as a whole with a view to increasing long-term investment returns.



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