Discussion Paper on Corporate Disclosure of GHG-related Information For the Japanese Financial Sector

March 2023

PCAF Japan coalition

PCAF Partnership for Carbon Accounting Financials

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PCAF

1. Overview of PCAF/PCAF Japan

PCAF (Partnership for Carbon Accounting Financials)

- International initiative launched in 2015
- Develop a methodology to measure greenhouse gas emissions associated with financial activities
- Currently, more than 380 financial institutions from over 60 countries, including commercial banks, investment banks, institutional investors and insurance companies, are participants. The total assets of member institutions exceed approximately USD 85 trillion

PCAF Japan coalition

- Launched in November 2021 by Japanese financial institutions
- Promoting collaboration among participants and knowledge sharing of best practice in measuring greenhouse gas emissions associated with lending and investment portfolios
- Consists of 25 participants (as of December 2022, alphabetical order):
  - Aozora Bank
  - Asset Management One
  - Chiba Bank
  - Concordia Financial Group
  - Daiwa Securities Group
  - Japan Post Bank
  - Japan Post Insurance
  - Kyushu Financial Group
  - Meiji Yasuda Life Insurance
  - Mitsubishi UFJ Financial Group
  - Mizuho Financial Group
  - MS&AD Insurance Group Holdings
  - Nippon Life Insurance
  - Nissay Asset Management
  - Nomura Asset Management
  - Nomura Holdings
  - Sanin Godo Bank
  - Shinsei Bank
  - Shizuoka Financial Group
  - SOMPO Holdings
  - Sumitomo Life Insurance
  - Sumitomo Mitsui Financial Group
  - Sumitomo Mitsui Trust Holdings
  - The Norinchukin Bank
  - Tokio Marine & Nichido Fire Insurance

1. Importance of GHG measurement and corporate disclosure information

Measuring the GHG emissions associated with lending and investment activities (financed emissions)

- Decarbonisation is a major structural shift in the economy and society, and financial institutions need to capture the associated risks and opportunities together with the companies which it has loaned and invested in portfolio. **For financial institutions' role in promoting decarbonisation,** it is important to clarify the relationship between their own business and GHG emissions by **calculating GHG emissions associated with lending and investment (= Scope 3 category 15 - Financed Emissions, FE).**
- The quality and disclosure of the emissions data provided by the investee or borrower are essential factors in calculating FE. The PCAF Standard REQUIRES FIs to use the highest quality data available and improve the quality of the data over time. Directly reported emissions from investees are crucial information required for FIs **to assess their portfolio emissions and engage with their investees in the transition.**
- While directly reported emissions is the goal of data quality, it is vital for companies to start their journey of GHG emission accounting, reporting on it and gradually working with the partner companies to achieve their decarbpnisation.

Basic formula and data scores in the PCAF Standard

- Allocate the GHG emissions of the investees and borrowers by the financial institution's proportional share (attribution factor).

$$\text{Financed emissions (FE)} = \sum_{c} \text{(1) Attribution factor}_c \times \text{(2) Company emissions}_c$$

$$\text{(1) Attribution factor} = \frac{\text{Outstanding amount}}{\text{Clients' corporate value (total equity + debt)}}$$

(2) Company emissions = Clients' disclosed values for Scope 1, 2, and 3 emissions. Estimates used when disclosures not available.

- Scoring from 1 to 5 according to data quality

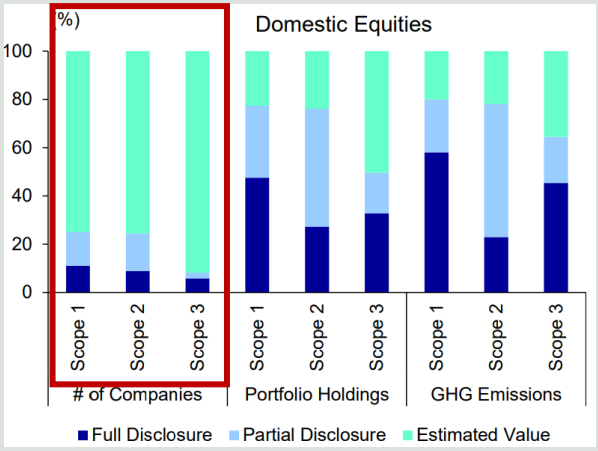
Certain ↑ Uncertain ↓

Data quality	Option		Overview
Score 1	Reported emissions		Emissions data from company disclosures (with third-party certification)
Score 2	Reported emissions		Emissions data from company disclosures (without third-party certification)
Score 2	Estimated emissions	Physical activity-based	Emissions data estimated from company energy consumption and emission factor
Score 3	Estimated emissions	Physical activity-based	Emissions data estimated from company production and emission factor
Score 4	Estimated emissions	Economic activity-based	Emissions data estimated from company sales and emission factor
Score 5	Estimated emissions	Economic activity-based	Emissions data estimated from company financing and investment balance and emission factor

2.(1) Status of corporate GHG emissions disclosure (i)

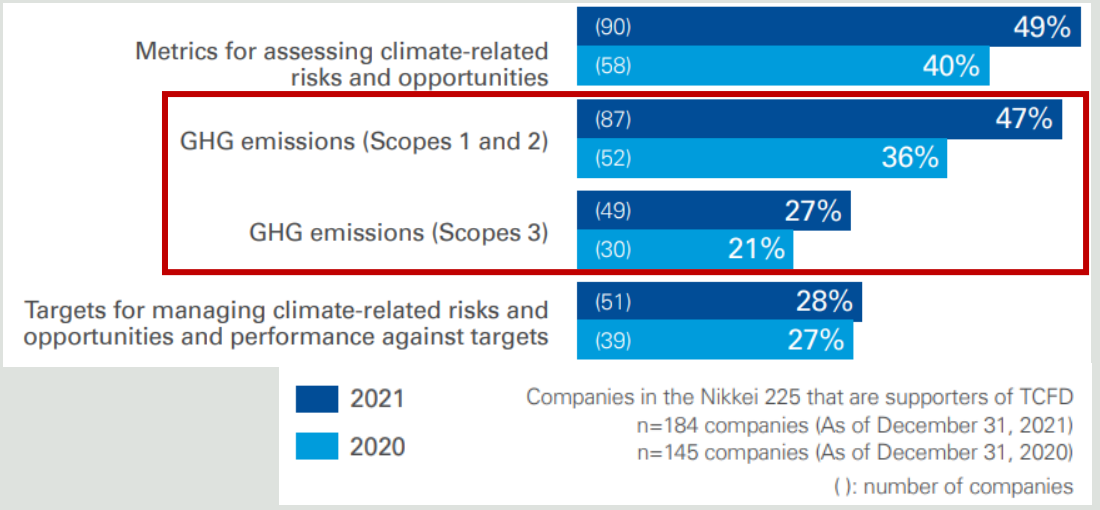
- 'In Japan, while interest in measuring and disclosing corporate GHG emissions is growing, the number of companies actually reporting remains a small portion.
  - According to an analysis of emissions disclosure by domestic companies in the investment portfolio of the Government Pension Investment Fund (GPIF), **around 20% of companies disclose scope 1 and 2 emissions, and scope 3 emissions are disclosed by only about 10% companies.** If there is no data disclosed by the company, the estimated value would be used to calculate the emissions.
  - The survey of companies consisting Nikkei 225 or expressing support to the TCFD indicated that **scope 1 and 2 was disclosed by around 50% companies in Japan and scope 3 was disclosed by around 30%.** The disclosure of the emission data is limited even by companies supporting the TCFD.

Disclosure of GHG emissions by domestic companies (excerpts from GPIF data)



Source: Government Pension Investment Fund, FY2021 Analysis of Climate Change-Related Risks and Opportunities in the GPIF Portfolio' , September 2022

Disclosure status of indicators and targets in line with TCFD recommendations in integrated reports by Japanese companies (excerpts from KPMG survey)

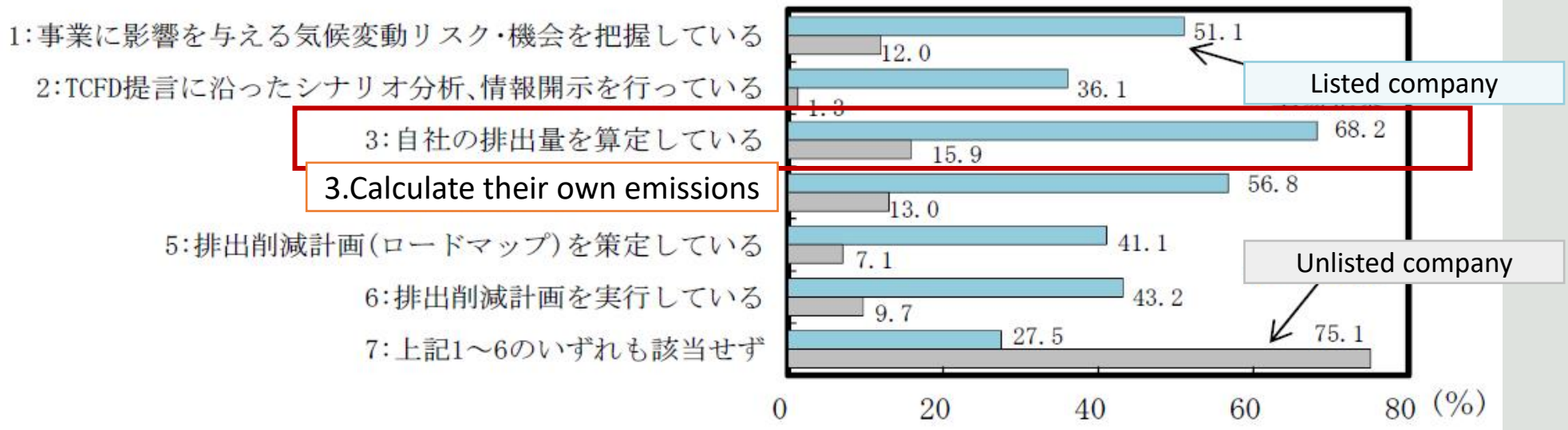


Source: KPMG Japan, Survey on Corporate Reports in Japan 2021 , April 2022

2.(1) Status of corporate GHG emissions disclosure (ii)

- According to a Cabinet Office survey of Japanese companies, only about **68% of listed companies and 16% of unlisted companies** calculate their emissions.

Status of efforts by Japanese companies to decarbonise (excerpts from Cabinet Office data)



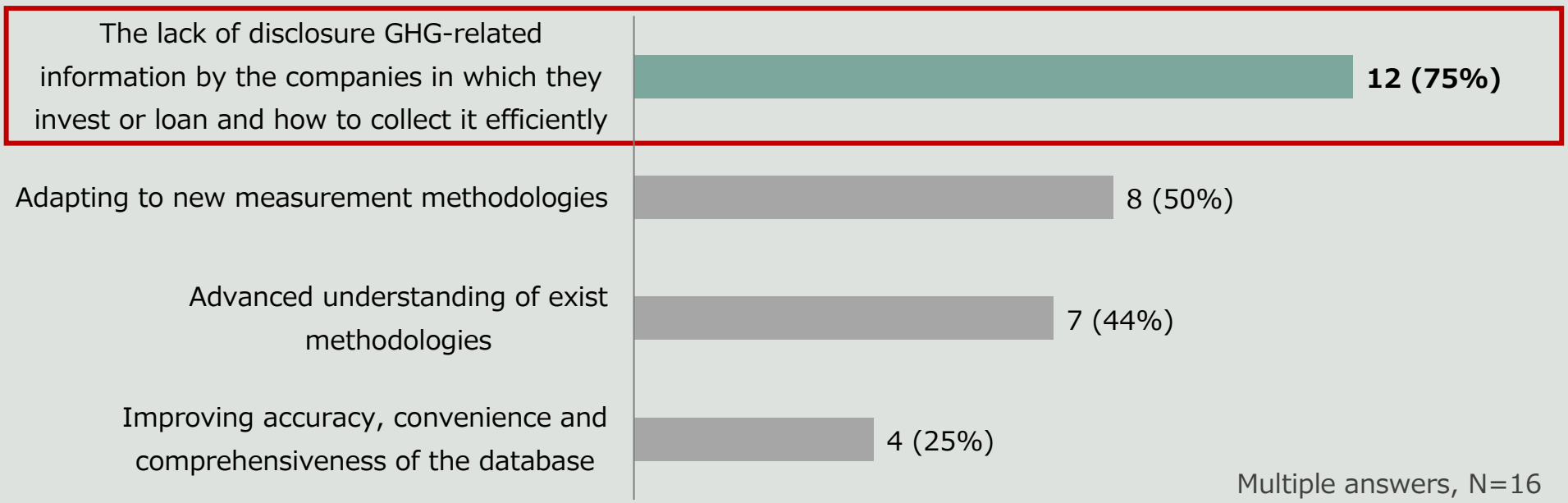
(備考) 内閣府「カーボン・ニュートラルが企業活動に及ぼす影響について」により作成(以下、全ての図表で同様)。
回答企業数は 1,693 社。複数回答。

Source: Cabinet Office, "Economic and Fiscal Analysis Discussion Paper: The State of Efforts by Japanese Companies to Decarbonise - Overview of the Results of the Questionnaire Survey" , June 2022.
Status of efforts towards decarbonisation of Japan's enterprises - Summary of results of analysis of questionnaire survey" , June 2022

2.(1) Status of corporate GHG emissions disclosure (iii)

- In a questionnaire survey among PCAF Japan participants, the most frequently cited issue was **the lack of disclosure GHG-related information by the companies in which they invest or lend to and how to collect it efficiently.**

PCAF Japan internal survey among participants: 'Recognized issues in measuring Financed Emissions'.



PCAF Japan Questionnaire within participants:

- April-May 2022 survey.
- The survey covered: 17 financial institutions participating in PCAF Japan as of April 2022.
- Number of respondents: 17 institutions (response rate: 100%)

2.(2) Data obtained, and indicators focused on by PCAF Japan **participants** (by sector)

- All financial institutions, regardless of industry, attach importance to corporate GHG emissions (Scope 1, 2, 3).
- In addition to emissions data, banks also focus on activity and production data (e.g. electricity generation, oil and gas production, oil refining, transport, etc.)
- Life and non-life insurers and asset managers also focus on emissions per invested amount and emissions per company turnover (WACI) indicators.

Extracts from survey results within PCAF Japan participants

		Q: Scope to measure (Scope1,2,3)		**Q. What data do you obtain from your data provider?** (Multiple answers allowed)				**Q. If data on activity volumes** (energy consumption, production, etc.) **are obtained, how to obtain them?**			**Q: Which emissions intensity values will you continue to monitor in the future, either by setting targets or as reference values?** (Multiple answers allowed)			
		Scope 1,2,3 all	Scope 1,2 only	Financials data	GHG emission	Activity amount	Transition risk scenarios	External data	Collected internally from disclosed data	Not obtained	Carbon Intensity per invested amount	Carbon Intensity per production volume	Weighted Average* Carbon Intensity (WACI)	Other
Respondents	(N=17)	8	8	16	15	4	2	1	6	10	10	7	8	3
%		47%	47%	94%	88%	24%	12%	6%	35%	59%	59%	41%	47%	18%
Bank	Respondents	3	2	6	**6**	**4**	0	0	4	2	1	**4**	1	2
	% within sector	50%	33%	100%	**100%**	**67%**	0%	0%	67%	33%	20%	**80%**	20%	40%
Securities	Respondents	1	1	2	**1**	**0**	0	0	1	1	**2**	**2**	0	0
	% within sector	50%	50%	100%	**50%**	**0%**	0%	0%	50%	50%	**100%**	**100%**	0%	0%
Life insurance	Respondents	1	2	3	**3**	**0**	0	0	0	**3**	**3**	1	**2**	1
	% within sector	33%	67%	100%	**100%**	**0%**	0%	0%	0%	**100%**	**100%**	33%	**67%**	33%
Non-life insurance	Respondents	2	1	3	**3**	**0**	1	1	0	**2**	**2**	0	**3**	0
	% within sector	67%	33%	100%	**100%**	**0%**	33%	33%	0%	**67%**	**67%**	0%	**100%**	0%
Asset management	Respondents	1	2	2	**2**	**0**	1	0	1	**2**	**2**	0	**2**	0
	% within sector	33%	67%	100%	**100%**	**0%**	50%	0%	33%	**67%**	**100%**	0%	**100%**	0%

* WACI: a weighted average of the ratio of GHG emissions to sales of each company in the loan portfolio, weighted by the share of each company's holdings.

2.(3) Target requirements of key Net Zero Initiatives for FIs in Japan

- NZAOA: Within sub-portfolio emission targets, set reduction targets covering -22% to -32% by 2025.
- NZAM: Set targets by using one of the three methods. The indicators set and data used vary depending on the method.
- NZBA: Set targets for each of the nine high-emission sectors. Focus on sector-specific indicators and data.

Asset Owner

NZAOA

Net-Zero
Asset Owner Alliance

- Established in 2019
- Number of institutions: 83
- Assets: USD 11 trillion

- For Investment portfolios
- At least three of the following four targets must be set

(i) Sub-portfolio emission targets: -22% to -32% carbon reduction by 2025

(ii) Sector targets: Intensity reduction targets for multi-emission sectors*1

(iii) Engagement targets

(iv) Financing transition targets: Investment targets in climate positive areas

Asset Manager

NZAM

Net Zero
Asset Managers Initiative

- Established in 2020
- Number of institutions: 291
- Assets: USD 66 trillion

- For AUM investment portfolios
- Target setting is recommended for one (or a combination) of the following three methodologies

(i) PAII Net Zero Investment Framework: [Portfolio targets] or [Asset class targets]

(ii) SBT for Financial Institutions: [Sectoral Decarbonization Approach], [SBTi Portfolio Coverage Approach], [The Temperature Rating Approach]

(iii) NZAOA Target Setting Protocol (see left)

Banks

NZBA

Net-Zero
Banking Alliance

- Established in 2021
- Number of institutions: 122
- Assets: USD 72 trillion

- For Investment and loan portfolios
- Absolute emissions and/or sector-specific emissions intensity (e.g. CO2e/ metric) must be set
- All or most of the sectors with high carbon intensity*2 must be set

Insurance Company

NZIA

Net-Zero
Insurance Alliance

- Established in 2021
- Number of institutions: 29
- Assets: -

- For re/insurance portfolios

(Target setting requirements not yet finalised, to be decided in January 2023)

(Insurance-associated emissions = Attribution factor × Emissions of insured company or asset is target indicator)

Source: compiled by PCAF Japan coalition based on disclosed information
(Surveyed based on information as of 12 December 2022)

*1 High emitting sectors as defined by the NZAOA: oil and gas, utilities (including coal), transport (aviation, shipping, land transport), materials (steel, cement, aluminium), agriculture and others, chemicals, construction and buildings, water, textiles and leather.
*2 Carbon intensive sector as defined by the NZBA: agriculture, aluminium, cement, coal, commercial/residential property, steel, oil and gas, power generation, transport.

2.(4) Emissions-related data on which FIs focus and why

- **The emissions-related data** that PCAF Japan participants **focus on** is summarised below, based also on "the Code of Conduct for ESG Evaluation and Data Providers*1".
- The progress of corporate information disclosure will enable **FIs to measure and track Financed Emissions, understand the realities of the companies they invest or loan and enhance their engagement in the transition to a decarbonised economy**.

What data is important? (Desirable data disclosed by corporations)	What purpose is it used for and why important?	Supplementary information and background
● **Emissions by scope 1, 2 and 3** according to the GHG Protocol	● It is **the most important fundamental data** for FIs to measure and capture Financed Emissions	• We recommend that emissions are reported by **scope 1, 2 and 3 following the GHG Protocol** rather than just following the Global Warming Act*2. – It is also consistent with the draft ISSB standards. By **reporting based on global standards**, companies can respond to requests from their business partners, improve their reputation with investors, and increase their corporate value. • Only a few companies disclose scope 3 emissions compared to scope 1 and 2. Particularly in sectors where scope 3 has a high weighting, active disclosure is desirable. On the other hand, we understand that the burden on companies for calculation is high. • Where companies do not disclose their data, FIs calculate their emissions based on estimates, which risks not giving an accurate view of the company's actual situation. • Emissions will not decrease reliably every year but may increase due to various factors (e.g. more sophisticated and targeted measurement methods, business expansion, and investments for medium-term transition). • Proactive disclosure of emissions reduction targets and strategies and initiatives to achieve them is also desirable.
➢ If **scope 3** is important, data showing the correspondence of categories (1-15)	➢ Scope 3 emissions allow FIs to identify where GHGs are being generated in the value chain associated with companies' business activities.	
➢ If several business units are in operation, emissions in business units significant in terms of their emissions structure	➢ Detailed data disclosure provides a deeper understanding of a company's business structure and where risks and opportunities lie.	
➢ For consolidated groups of companies, the scope of the entity being measured		
➢ Scope of GHG types being measured (CO_2, methane, dinitrogen monoxide, etc.)	➢ To confirm that material GHGs are covered	
➢ Increase or decrease in emissions from previous years and explain how the company sees the reasons for them	➢ To understand the actual situation - is the emissions reduction effort working, or are other factors contributing to the increase or decrease?	
● **Sector-specific activity data** e.g. Electricity sector: electricity generation and emissions by source mix and emissions intensity per unit of electricity generated. Oil and gas sector: oil and gas production, refining volumes, and emissions intensity per unit of activity.	● To measure and capture **emissions intensity** based on sectoral activities ➢ Enable a deeper understanding of where the risks/opportunities lie based on the physical emissions intensity of a company's operations	• As GHG emission structures and drivers for emission reductions vary from sector to sector, it is desirable to disclose the activity data that is important for the industry to understand the reality correctly. • As for emissions intensity, the purchase of credits should be calculated and disclosed separately from emissions.

*1: 15 December 2022, Financial Services Agency, "Finalization of "the Code of Conduct for ESG Evaluation and Data Providers"" (https://www.fsa.go.jp/en/news/2022/20221215/20221215.html) . Organised on the recommendation that the basic approach to how investors use ESG assessments and data should be made clear to the public. Reference material on p.18. *2: Act on Promotion of Global Warming Countermeasures

2.(4) Towards efficient collection of information on emission-related data

- As for disclosed corporate emissions data, each FIs is also making considerable efforts to collect data independently.
- The construction of an information platform to aggregate ESG data, including corporate emissions data, which is under discussion in Japan, would benefit FIs and companies aiming to decarbonise their supply chains. PCAF Japan participants would like to collaborate and contribute to the platform to make it more convenient for users.

Issues identified by PCAF Japan participants (excerpts efficiency-related issues)

Main practical problem: efficient collection of disclosure data

- It is difficult to collect data efficiently because disclosure formats are not standardised.
- Formats provided by data vendors do not sufficiently adapt to PCAF.

Challenges in building an efficient measurement process:

- We have been running the Financed Emissions measurement project through trial and error throughout the year in the relevant departments of the Group. However, it is a labour-intensive process, with measurement standards and data still developing.

Optimization of information-gathering processes on companies

Lack of disclosure of emissions data and production data of investee and borrower, and uniformity of disclosed information

Efficient collection of accurate emissions data (by Scope 1, 2 and 3) for investees and borrowers, including unlisted companies

Trends in ESG data information platforms
(The Second Report by the Expert Panel on Sustainable Finance)

3. Progress and challenges in sustainable finance initiatives
(3) Capital market functions.
d) Information platforms [p. 20].

As for the platform, it is desirable to gradually expand the scope of data aggregation to other financial products, such as ESG-related investment funds, not just ESG bonds, while improving user convenience (UX). As for corporate information, the Expert Panel expects that **ESG data of companies, such as greenhouse gas emissions, will also be aggregated sequentially** and the platform to become the hub for Japan's ESG investment.

In particular, with regard to corporate sustainability information, it is expected that disclosure will be enhanced in the future, taking into account discussions at the ISSB, SSBJ, and the Financial System Council's Working Group on Corporate Disclosure (see p12). Based on these developments, **it is expected that corporate data will be aggregated on the platform**, in cooperation with disclosure information systems.

(5) Overarching issues

e) Chollection and publication of data [p. 29]

The importance of climate change data is increasing, as discussions on sustainability disclosure by companies in Japan and overseas are advancing, and **it is becoming important to understand emissions including business partners (Scope3),** for example, in FI's initiatives to achieve net-zero.

With regard to data published by companies, as mentioned above, it is expected that JPX will develop a data infrastructure with high user convenience (UX) in conjunction with the disclosure information system.

Source: The Second Report by the Expert Panel on Sustainable Finance, July 2022
(bold emphasis added by quoter (PCAF Japan)

3. Good practice in companies' disclosures related to GHG emissions

- Based on recommendations from PCAF Japan participants, we collected good examples of companies with GHG emissions-related information disclosure.

Page Numbers	Company Name (legal personality abbreviated)	Strengths and reason for selection
P13	OMRON Corporation	The GHG reductions are broken down by factor which contribute to reduce the GHG and explained so that readers can assess the effectiveness of the company's efforts.
P14	JERA	The emissions data is disclosed in multiple layers, such as by coverage (non-consolidated/consolidated, domestic/international), by business (emissions from power generation business) and by scope 3 categories.
P15	Daikin Industries	Amount of contribution to emission reduction are disclosed and reviewed by third-party assurance organisations to enhance credibility.
P16	Marubeni Corporation	Data is disclosed for each scope 3 category, with reasons given for categories not covered. In addition, performance against the reduction targets for scope 3 category 15 is disclosed for each business.
P17	Mitsubishi Corporation	The company discloses emissions by segment, which helps to understand and assess its business structure. Also, disclosure of activity data by projects including energy and power generation is detailed and easy to understand

3. Good practice: OMRON Corporation

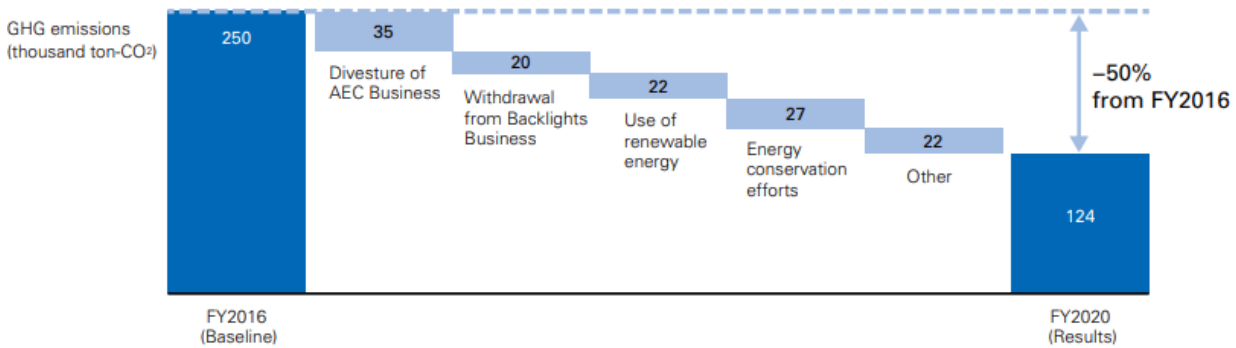
- The GHG reductions are broken down by factor which contribute to reduce the GHG and explained so that readers can assess the effectiveness of the company's efforts.

Indicators and Targets

OMRON has designated GHG emissions as an indicator for climate change, and has set the OMRON Carbon Zero target, which aims to reduce GHG emissions to zero by fiscal 2050. Using the Scope 1 and 2 GHG emissions quantities of fiscal 2016 as a baseline, we backcast from fiscal 2050 to set reduction targets for fiscal 2030 and fiscal 2020*1 and are promoting various reduction efforts to achieve these goals. Specifically, in fiscal 2018, we began procuring electricity from renewable energy sources in Japan. In fiscal 2019, we started Analysis of Energy Conservation Potential*2 for our operating sites in Asia-Pacific, which is the second largest energy-consuming region after Japan and China. At our Indonesia Plant, we identified scope for energy conservation equivalent to 23% of its annual energy consumption and are implementing measures under the medium-term energy conservation plan.
In fiscal 2020, in addition to promoting energy conservation measures at each site and installing new solar power systems, we conducted analysis of energy conservation potential remotely at our Malaysia Plant, where energy consumption was high. As a result of these efforts, we reduced GHG emissions to 124 thousand ton-CO_2 on a company-wide basis in fiscal 2020, a 50% reduction compared to fiscal 2016. OMRON will continue its efforts to reduce greenhouse gas emissions, aiming to reduce the emissions to zero by 2050.
Currently, we are considering setting new targets, including for Scope 3, for the next long-term vision.

*1 Greenhouse gas emissions calculated from sales forecasts, including the Automotive Electronic Components Business (AEC) that was sold off in October 2019. In considering targets to align with the SBT criteria in fiscal 2017, we set 2016, the year of the latest values, as the reference year. (SBT: Science Based Targets. Science-based, medium- to long-term targets for reducing greenhouse gases.)
*2 OMRON's unique approach to identifying energy loss risks and opportunities for improving energy efficiency at production locations, formulating specific measures with estimates of impacts and costs.

GHG Emissions in Fiscal 2020



Source: OMRON Corporation Integrated Report 2021 (Year Ended March 31, 2021), p 73

3. Good practice: JERA

- The emissions data is disclosed in multiple layers, such as by coverage (non-consolidated/consolidated, domestic/international), by business (emissions from power generation business) and by scope 3 categories.

Environmental Data

Item*1	Unit	FY2018*2	FY2019	FY2020
Fuel consumption for power generation				
Coal	million t	16.26	14.83	13.07
Petroleum	million kL	0.54	0.37	0.02
LNG, LPG, utility gas	million t	33.10	31.21	27.40
Biomass	thousand t	190	390	390
Sending-end power	billion kWh	283.4	265.3	244.6
Gas sales volume	million t	2.66	3.06	3.12
Total energy consumption (crude oil equivalent)	million kL	59.68	55.25	50.70
Total thermal power generation efficiency (low heating value)	%	49.7	50.1	49.7
Thermal Power Generation Efficiency Benchmark Index A*3 (Act on the Rational Use of Energy)	—	0.994	1.002	1.000
Thermal Power Generation Efficiency Benchmark Index B*3 (Act on the Rational Use of Energy)	%	46.3	46.8	46.8
Electric power consumption at offices, etc.	million kWh	11.60	10.92	9.51
Intensity of energy consumption at offices, etc.	MJ/m²	25.87	16.86	14.37
Industrial water intake	million m³	19.08	18.12	17.71
Tap water intake	thousand m³	390	870	810
Groundwater usage	thousand m³	20	20	180
Greenhouse gas (GHG) emissions associated with power generation business (Scope 1)	thousand t-CO_2	134,908	124,63 0	114,950
CO_2 emissions	thousand t-CO_2	134,850	124,500	114,830
CH_4 (methane) emissions	thousand t-CO_2	—	10	10
N_2O (nitrous oxide) emissions	thousand t-CO_2	120	110	100
SF_6 (sulfur hexafluoride) emissions*4	thousand t-CO_2	7	4	6
HFC (alternative CFC) emissions*4	thousand t-CO_2	0.3	0.6	0.4
Domestic/JERA Group CO_2 emissions associated with power generation business (Scope 1)*5	thousand t-CO_2	148,620	139,010	127,440
Global/JERA Group CO_2 emissions associated with power generation business (Scope 1)*5,6	thousand t-CO_2	166,300	161,110	147,920
CO_2 emissions associated with fuel upstream business (Scope 1)*5,6	thousand t-CO_2	150	240	350
CO_2 emissions associated with fuel transportation business (Scope 1)*5,6	thousand t-CO_2	200	300	330
CO_2 emissions from power consumption in buildings associated with business activities (Scope 2)	thousand t-CO_2	5	5	4

*1 Figures for JERA in Japan only and Hitachinaka Generation Co., Inc. unless otherwise noted
*2 Figures for FY2017 and FY2018 (before the consolidation of existing thermal power businesses) calculated based on totals of all JERA facilities as of April 1, 2019
*3 Figures for JERA in Japan only.
*4 Calendar year totals
*5 Joint venture figures calculated based on JERA's share
*6 As a rule, totals for overseas businesses are based on local fiscal years and reporting standards *7 Figures based on sending-end power

Item*1	Unit	FY2018*2	FY2019	FY2020
Other indirect CO_2 emissions (Scope 3)	thousand t-CO_2	25,490	23,910	20,680
Purchased goods and services	thousand t-CO_2	0.08	0.07	0.04
Capital goods	thousand t-CO_2	580	770	710
Activities related to fuel and energy	thousand t-CO_2	24,700	22,970	19,800
Fuel transportation and circulation in upstream departments	thousand t-CO_2	—	—	—
Waste generated by business	thousand t-CO_2	210	160	170
Business travel	thousand t-CO_2	0.6	0.6	0.6
Employee commuting	thousand t-CO_2	1	1	1
Lease assets of upstream departments	thousand t-CO_2	—	—	—
Fuel transportation and circulation in downstream departments	thousand t-CO_2	—	—	—
Processing of sold products	thousand t-CO_2	—	—	—
Use of sold products	thousand t-CO_2	—	—	—
Treatment after disposal of sold products	thousand t-CO_2	—	—	—
Lease assets of downstream departments	thousand t-CO_2	—	—	—
Franchise	thousand t-CO_2	—	—	—
Investment	thousand t-CO_2	—	—	—
CO_2 emission intensity of power generation*7	kg-CO_2/kWh	0.476	0.469	0.469
Domestic/JERA Group: CO_2 emission intensity of power generation business*5,7	kg-CO_2/kWh	0.493	0.492	0.491
Global/JERA Group: CO_2 emission intensity of power generation business*5,6,7	kg-CO_2/kWh	0.499	0.496	0.493
SF6 (sulfur hexafluoride) capture rate (during inspections)	%	99.7	99.8	99.9
SF6 (sulfur hexafluoride) capture ate (during removal)	%	100.0	100.0	99.4
SOx (sulfur oxide) emissions	thousand t	9.24	7.50	5.09
SOx (sulfur oxide) emission intensity*7	g/kWh	0.03	0.03	0.02
NOx (nitrogen oxide) emissions	thousand t	23.2	21.1	17.8
NOx (nitrogen oxide) emission intensity*7	g/kWh	0.08	0.08	0.07
Gross wastewater volume	million m³	7	7.6	7.51
COD (chemical oxygen demand) emissions	t	20	21	20
Industrial waste and byproducts generated	million t	2.39	1.99	2.04
Disposal by reclamation	thousand t	20	10	10
Coal ash effective utilization rate	%	99.98	99.99	99.99
Number of severe leaks	cases	0	0	0
PCB (polychlorinated biphenyl) content Number of transformers and capacitors disposed of	units	111	16	57
Volume of PCB-contaminated insulating oil treated	kL	124	86	510
Cases involving fines and sanctions for violations of environmental laws and regulations	cases	0	0	0

Source: JERA Group Corporate Communication Book2021, p 46

3. Good practice: Daikin Industries

- Amount of contribution to emission reduction are disclosed and reviewed by third-party assurance organisations to enhance credibility.

Sustainability Report

THIRD-PARTY VERIFICATION

To ensure reliability of the content of this report, Daikin contracts with a third-party to verify its data on greenhouse gas emissions, water use, waste water, waste emissions, and chemical substances emissions.

↓ Data Covered by Verification ↓ Scope of Review

Data Covered by Verification

Environmental Impact Data on Business Operations in FY2021

- Scope 1 and Scope 2 greenhouse gas (GHG) emissions, water use, waste water, waste emissions, and chemical substances emissions from business operations of four production bases in Japan of Daikin Industries, Ltd.,, eight production subsidiaries in Japan, and 58 production subsidiaries overseas.
- Category 1 (purchased goods and services), 11 (use of sold products), and 12 (final product disposal) emissions of Scope 3 GHG emissions calculated in line with the GHG Protocol's "Corporate Value Chain (Scope3) Accounting and Reporting Standard."

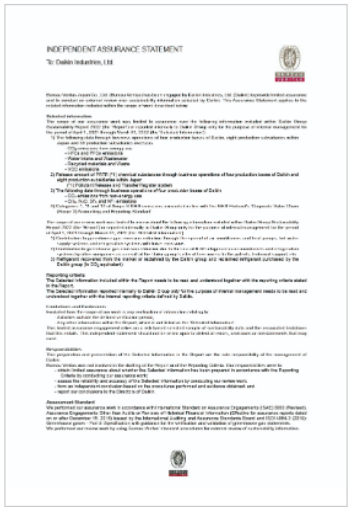
Scope of Review

Contribution to Greenhouse Gas Emission Reduction* through the Use of Products

- Amount of contribution to emission reduction
  - Contribution to greenhouse gas emission reduction through the spread of air conditioners and heat pumps, hot water supply systems and refrigeration systems with lower emissions
  - Contribution to greenhouse gas emission reduction due to the use of R-32 refrigerant in air conditioners and refrigeration systems by other companies as a result of the Daikin group's offer of free access to the patents, technical support, etc.
- Amount of refrigerant recovery and recycling from market
  - Refrigerant recovered from the market or reclaimed by the Daikin group and reclaimed refrigerant purchased by the Daikin group(in CO_2 equivalent)

* Calculated with F-gas recovery rate as 0%.

INDEPENDENT ASSURANCE STATEMENT



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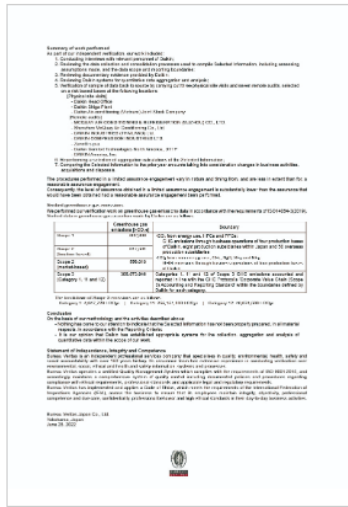

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Contributions to GHG emission reduction OJG

(Thousand tons-CO_2)

		2020	2021
Amount of contribution to emission reduction*	Contribution to greenhouse gas emission reduction through the spread of air conditioners and heat pumps, hot water supply systems and refrigeration systems with lower emissions	1,500	5,000
	Contribution to greenhouse gas emission reduction due to the use of R-32 refrigerant in air conditioners and refrigeration systems by other companies as a result of the Daikin group's offer of free access to the patents, technical support, etc.	9,200	11,260
Amount of refrigerant recovery and recycling from market	Refrigerant recovered from the market or reclaimed by the Daikin group and reclaimed refrigerant purchased by the Daikin group(in CO_2 equivalent)	4,600	4,670

Source: Daikin website: Sustainability Report: third-party verification

3. Good practice: Marubeni Corporation

- Data is disclosed for each scope 3 category, with reasons given for categories not covered. In addition, performance against the reduction targets for scope 3 category 15 is disclosed for each business.

	Category	CO_2 Emission Amount (GHG Emission Amount) Unit: tons of CO_2	Calculation Method, etc.
1	Purchased Goods and Services		Marubeni uses broad business networks, both within Japan and overseas, to conduct importing and exporting (including third country trading), as well as domestic business, encompassing a diverse range of business activities across wide-ranging fields including lifestyle, ICT business & logistics, food, agri business, forest products, chemicals, metals & mineral resources, energy, power, infrastructure project, aerospace & ship, finance, leasing & real estate business, construction, industrial machinery & mobility, next generation business development and next generation corporate development. Additionally, the Marubeni Group offers a variety of services, makes internal and external investments, and is involved in resource development throughout all of the above industries. Being a general trading company dealing with many different types of products, it is very difficult for us to calculate the emission for all products.
2	Capital Goods	278,513	For the reporting fiscal year, the acquisition cost of tangible fixed assets on a consolidated basis was JPY 28,459 million for buildings and structures, and JPY 51,116 million for machinery and equipment. The total of these are multiplied by the emission intensity (total 00- 000) per unit price of capital goods.
3	Fuel and Energy Related Activities Not Included in Scope 1 and 2	230,887	For the calculation, the amount of electric power, steam, and fuel purchased by Marubeni Corporation and its consolidated subsidiaries is multiplied by the emission intensity of the Cradle to Gate method.
4	Transportation and Distribution (Upstream)	13,768	The CO_2 emission of Marubeni Corporation's domestic transportation (upstream/downstream) is calculated based on Japan's Act on Promotion of Global Warming Countermeasures, and includes category 9 emissions. Transportation outside Japan is not included. (Breakdown)Truck : 5,975 t-CO_2, Ship : 7,790t-CO_2, Rail : 3t-CO_2, Air : 0 t-CO_2
5	Waste Generated in Operation	19,721	The amount of waste for the reporting fiscal year is multiplied by the emission factor of wood waste (including those in transportation process), which account for the largest share.
6	Business Travel	5,993	The number of Marubeni Group employees is multiplied by the emission intensity per number of employees.
7	Employee Commuting	10,898	The number of Marubeni Group employees is multiplied by the emission intensity per number of employees/number of work days (office/metropolis) and the number of work days for the reporting fiscal year.
8	Leased Assets (Upstream)	0	All energy usage amounts for assets leased by contract are included in Scope 1 or 2.
9	Transportation and Distribution (Downstream)	0	Emissions for category 9 are included in category 4.
10	Processing of Sold Goods		The products we handle range across various business areas and from upstream to downstream, so it is very difficult to come up with the emission amount for processing of sold goods in a rational way.

Source: Marubeni website: 'Scope 3 emissions in FY2022'

Metrics and Targets

Climate Change-Related Metrics and Targets

The Marubeni Group has formulated the following metrics and targets as part of our response to the opportunities and risks associated with climate change.

Metrics and targets	Progress and status
1. Cut Group's coal-fired power net generation capacity from FYE 3/2019 value of approx. 3GW in half by 2025, with further abatement to approx. 1.3GW by 2030, and aim for zero capacity by 2050	Approx. 2.6GW (as of March 31, 2022)
2. Expand the ratio of power generated by renewable energy source in Group's own net power supply to approx. 20% by 2023	Approx. 15% (as of March 31, 2022)
3. Expand "Green Revenue" to around ¥1,300 billion by FYE 3/2024	Approx. ¥1,080 billion (FYE 3/2022)
4. Achieve net-zero GHG emissions*1 by 2050 By 2030: (1) Reduction of 50% in Scope 1 & 2 CO_2 emissions from FYE 3/2020 level (about 1 million t-CO_2) (2) Reduction of 20% in Scope 3 CO_2 emissions (Category 15: Investment) from FYE 3/2020 level (estimated CO_2 emissions about 36 million t-CO_2*2)	(1) Scope 1 & 2 CO_2 emissions: approx. 1.12 million t-CO_2 (FYE 3/2022) (2) Scope 3 CO_2 emissions (Category 15: Investment) *3: approx. 25 million t-CO_2 Breakdown Power generation approx. 21 million t-CO_2 Resource projects approx. 2 million t-CO_2 Other businesses approx. 1 million t-CO_2 (FYE 3/2022)

*1. Includes Scope 1, Scope 2, and Scope 3 (Category 15: Investment) emissions
*2. This emissions volume comprises the FYE 3/2020 performance of existing investees plus the estimated emissions from projects already contracted as of March 2021 (as for power generation projects, projects for which associate investees of the Marubeni Group have entered into power purchase agreements but have not yet achieved commercial operations)
*3. The sum of breakdowns may not match totals due to rounding.

Source: Marubeni Corporation: Disclosure in Line with the Recommendations of the TCFD, September 2022.

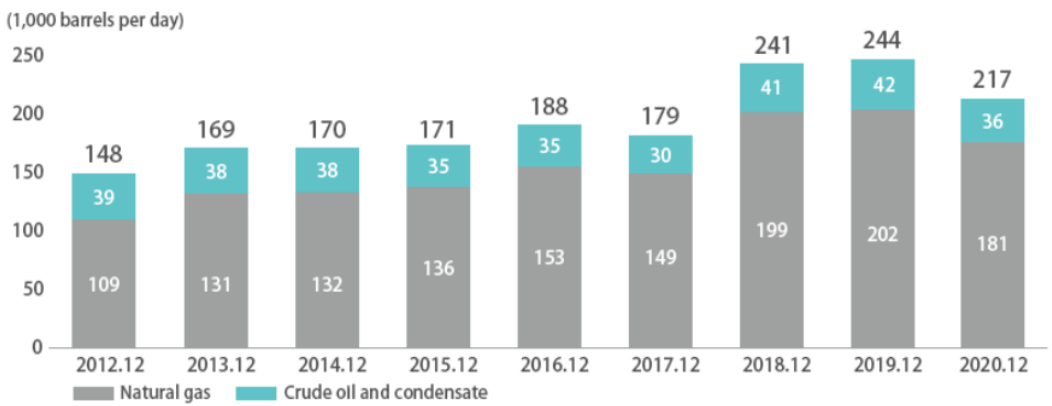
3. Good practice: Mitsubishi Corporation

- The company discloses emissions by segment, which helps to understand and assess its business structure.
- Also, disclosure of activity data by projects including energy and power generation is detailed and easy to understand.

Emissions by Segment (Unit: Thousand t-CO_2e)

	2020.3	2021.3	2021.3
Natural Gas Group	245	350	3,172
Industrial Materials Group	149	125	407
Petroleum & Chemicals Solution Group	165	123	1,222
Mineral Resources Group	2,872	2,782	3,201
Industrial Infrastructure Group	83	86	126
Automotive & Mobility Group	20	15	140
Food Industry Group	1,195	1,135	1,430
Consumer Industry Group	1,523	1,442	241
Power Solution Group	3,168	3,111	12,889
Urban Development Group	6	5	20
Corporate Staff Section	11	9	4

Equity Share of Oil and Gas Upstream Production (Annual Average)*1



Gas-Fired Projects

(As of March 31. 2022)

Country	Power plant	Net equity basis (Net, 10,000 kW)
USA	Frontier	23.2
USA	Wildflower/ Indigo	13.6
USA	Wildflower/ Larkspur	9.4
USA	Mariposa	20.0
USA	Sentinel	42.4
USA	CPV Valley	36.0
USA	Westmoreland	35.3
Mexico	Tuxpan II	24.8
Mexico	Tuxpan V	24.8
The Netherlands	Gas generation owned by ENECO	75.4
Jordan	IPP-3	20.1
Qatar	Facility D	50.4
Philippines	Ilijan	26.5
Thailand	Gas generation owned by EGCO	20.2
Japan	Naoetsu Energy Center	10.7

Source: Mitsubishi Corporation: Sustainability website

[Ref] “the Code of Conduct for ESG Evaluation and Data Providers” (2022.12)

Bold emphasis is by the quoter (PCAF Japan).

Recommendations to investors [p. 38]

Recommendations: Investors should carefully examine and understand the purpose, methodologies, and limitations of ESG evaluation and data they utilize for their investment decisions. When there are issues in the evaluation results, they should engage in dialogue with ESG evaluation and data providers or companies. In addition, investors should publicly clarify the basic approach of how they utilize ESG evaluation and data in their investment decisions.

Specific recommendations

1. Investors should understand the basic objectives and policies of ESG evaluation and data they utilize for their investment decisions. They also should understand the evaluation and data’s methodologies and limitations such as:

   ● sources and timing of data used for evaluation, and estimation methodologies, ● degree of quantitative and qualitative judgments, verifiability, consistency with other evaluation criteria,

   ● considerations and limitations when using such evaluation and data

   If there is an unreasonable gap between the evaluation’s policies and the results, investors should hold a dialogue with evaluation providers and the companies.

2. Investors should clarify how they utilize ESG evaluation and data, the way of use investment decisions in the case of active investing, and the way of selection of target indices in the case of passive investing, specifically such as:

   ● **what kind of ESG evaluation and data are used for what purpose in order to make investment decisions,** ● **importance of the ESG evaluation and data in investment decisions,**

   ● **data that is emphasized or matters that are particularly noted, if any,** ● **reasons for selecting specific ESG indices for passive investing.**

   Similarly, when an investor conducts and utilize in-house ESG evaluation in investment decisions, they should similarly disclose, along with above points, the criteria, purpose, and usage of the in-house evaluations, also in consideration with their fiduciary responsibilities.

Recommendations to companies [p. 41]

Recommendations: Companies should disclose ESG information in an easy-to-understand manner, taking into account regulatory and other updates.

Specific recommendations

1. Companies should organize and disclose their ESG-related information in an easy-tounderstand manner by, for example, organizing important matters for the entire company from the perspectives of both risks and opportunities and providing them in a form that is easy for market participants to identify the essentials. Companies should ensure the quality of the ESG information they disclose under an appropriate system.

[Ref] The platform for corporate disclosure data (The Second Report by the Expert Panel on Sustainable Finance 22.7.13)

Bold emphasis is by the quoter (PCAF Japan).

3. Progress and challenges in sustainable finance initiatives
(3) Capital market functions.
d) Information platforms [p. 20]

As an infrastructure for the effective functioning of the market as a whole, the First Report identifies issues such as building an information platform for ESG-related bonds, gathering corporate sustainability-related data, and establishing a framework for objectively certifying the eligibility of ESG-related bonds.

In response to the First Report, **JPX set up the Sustainable Finance Platform Development Working Group** in October last year, then compiled and the Interim Report of the Working Group in January this year .

The Interim Report points out that ESG investment requires a wide range of ESG-related information, in addition to transaction information such as issue prices, compared to general stock and bond investments, but that such information is fragmented at present. Based on this, JPX **plans to launch an "Information Platform" by around the middle 2022** to aggregate issuance information on bonds, etc., ESG strategies of issuers, information on external review, and ongoing reporting information including impact.

Additionally, the Interim Report clarifies that JPX aims to expand the provision of educational content on Information Platform for better understanding of practitioners and broader scope of the content. The Interim Report also states that JPX will, as one of the essential elements of the future Platform, **consider compiling corporate ESG-related information and data.**

As for the platform, it is desirable to gradually expand the scope of data aggregation to other financial products, such as ESG-related investment funds, not just ESG bonds, while improving user convenience (UX). As for corporate information, the Expert Panel expects that **ESG data of companies, such as greenhouse gas emissions, will also be aggregated** sequentially and the platform to become the hub for Japan's ESG investment.

In particular, with regard to corporate sustainability information, it is expected that disclosure will be enhanced in the future, taking into account discussions at the ISSB, SSBJ, and the Financial System Council's Working Group on Corporate Disclosure (see p12). Based on these developments, **it is expected that corporate data will be aggregated on the platform**, in cooperation with disclosure information systems.

3. Progress and challenges in sustainable finance initiatives
(5) Cross-cutting issues.
(v) Collection and publication of data [p. 33]

Data on climate change is becoming increasingly important as discussions on sustainability disclosure by companies both within and outside the country progress, and as **it becomes more important to understand emissions (Scope 3), including those of trading partners**, such as financial institutions' efforts towards net-zero emissions.

With regard to **data published by companies and others**, as mentioned above, **it is expected that the JPX will develop a data infrastructure with high user-friendliness (UX) that is also linked to disclosure information systems and other systems.**