

# Mizuho Avoided Emissions Focus Report

## *Unlocking a Sustainable Future with Avoided Emissions*

Mizuho Financial Group  
Mizuho Bank  
Mizuho Trust & Banking  
Mizuho Securities  
Mizuho Research & Technologies  
Mizuho-DL Financial Technology

October 2024



Innovating today. Transforming tomorrow.

***By providing financial and non-financial solutions that utilize the “Avoided Emissions”, Mizuho will proactively support clients and other stakeholders in creating a positive impact and transitioning to net zero, thereby contributing to the realization of a sustainable society.***

Since the adoption of the Paris Agreement, a legally binding international treaty on climate change, in 2015, efforts to address climate change have been accelerated globally.

Countries and companies have set carbon-neutral goals and have developed roadmaps and transition plans to achieve these goals. Mizuho and other financial institutions have also joined global net zero alliances and are expanding the provision of financial and non-financial solutions to clients while setting the net zero goals and transition plans which are required of the financial institutions. Under the circumstances, legislation and assurance systems for climate-related disclosure, which had been voluntary, have also been considered globally.

Greenhouse gas (GHG) emissions are the most widely measured and disclosed metric for net zero goals, transition plans, and climate-related disclosures. Most of these GHG emissions are classified into Scope 1, 2, and 3 in corporate supply chains and disclosed based on the GHG Protocol, a comprehensive global standardized framework for measuring and managing GHG emissions.

On the other hand, as the world is rapidly responding to climate change, the challenge of GHG emissions, a key metric of climate-related disclosure, has been pointed out. In many cases, a company's GHG emissions increase when its economic activities and corporate production/sales volume increase and the corporate value is enhanced; especially when a company sells new products and services, or when its own products replace other companies'. Mizuho not only focuses on aspects of climate-related risks such as GHG emissions, but also assesses climate-related opportunities, aiming to grow and enhance corporate value together with its clients and become the most trusted partner for them.

As a climate-related metric that complements the challenge of GHG emissions, **"Avoided Emissions"** are drawing attention around the world. Avoided emissions are the amount of contribution to the reduction of GHG emissions by the user through the use of the company's products and services. In other words, it quantifies the contribution of the client to the reduction of GHG emissions in society as a whole.

In March 2023, the World Business Council for Sustainable Development (WBCSD), one of the convening bodies of the GHG Protocol, published "Guidance on Avoided Emissions". In addition, industry groups are developing methods for measuring and disclosing avoided emissions that take into account the characteristics of each industry.

In order to realize a decarbonized society worldwide, it is the most important to set a net zero goal for GHG emissions and a transition plan, but we believe that utilizing multiple metrics, including avoided emissions, will lead to appropriate evaluations of clients.

For this reason, Mizuho has been focusing on avoided emissions from an early stage, and has implemented unique initiatives in sustainable finance and consulting related to avoided emissions. This report was prepared in response to clients' comments that although they were interested in avoided emissions, there were not many materials that summarized avoided emissions from the perspective of financial institutions. We believe that this report will show the potential for avoided emissions in terms of climate-related opportunities, positive impacts, and transitions (transition to a net zero economy).

In collaboration with our clients and other stakeholders, Mizuho will continue to contribute to the realization of a sustainable society by providing financial and non-financial solutions that utilize avoided emissions.



4th October, 2024

A handwritten signature in black ink that reads "Y. Ushikubo".

**Mizuho Financial Group, Inc.**  
**Senior Executive Officer**  
**Group Chief Sustainability Officer (Group CSuO)**

## »» “Avoided Emissions” Becoming Focus of Global Attention

- Avoided emissions is a metric that complements GHG emissions analyses and can be used to assess climate-related opportunities, positive impacts, transitions, etc.
- Many stakeholders, including governments, global initiatives, financial institutions, and companies, are paying attention to avoided emissions, and methods for measuring and disclosing them have been developed.
- The world's largest asset owners are becoming more interested in avoided emissions, and there is a move in Europe to build a global database of avoided emissions.
- Disclosure of avoided emissions by Japanese companies is on the rise. In addition to avoided GHG emissions metric, some companies are disclosing their avoided metrics for water, waste, and pollutants.

## »» Mizuho's Achievements in Avoided Emissions

- Mizuho has established a model of collaboration within the group that contributes to expanding the use of the avoided emissions. In addition to contributing to the establishment of rules, guidelines, and evaluation models for avoided emissions, we provide full support to clients, from prior assessment of avoided emissions, to measurement and disclosure support and financing.
- Mizuho has set a sustainable finance target of JPY 100 trillion, including JPY 50 trillion for environment and climate-related finance, for FY2030 (cumulative since FY2019).
- Mizuho has extensive experience in sustainable finance and consulting related to avoided emissions.
- Mizuho published the “Impact Business Compass”, which shows the potential of Mizuho's impact businesses and its approach. Mizuho also established a working group for avoided emissions across the group and launched new activities to further utilize the metric.

## »» Future Potential of Avoided Emissions and Mizuho’s Initiatives

- Avoided emissions is one of the most suitable metrics for evaluating clients' contribution to decarbonization and climate-related opportunities (enhancement of corporate value), and it has the potential to be used in various financial and non-financial solutions in the future.
- Mizuho will make maximum use of its experience and expertise in avoided emissions, as well as its management resources within the group, work in cooperation with various stakeholders to further disseminate and promote this metric, and expand financial and non-financial solutions that utilize them.



### Mizuho’s Strengths

- ✓ Identity that has contributed to the development of industry and business since its foundation
- ✓ Expertise on industry, environment, society and technology
- ✓ Liaison with diverse stakeholders and comprehensive financial capabilities to support them

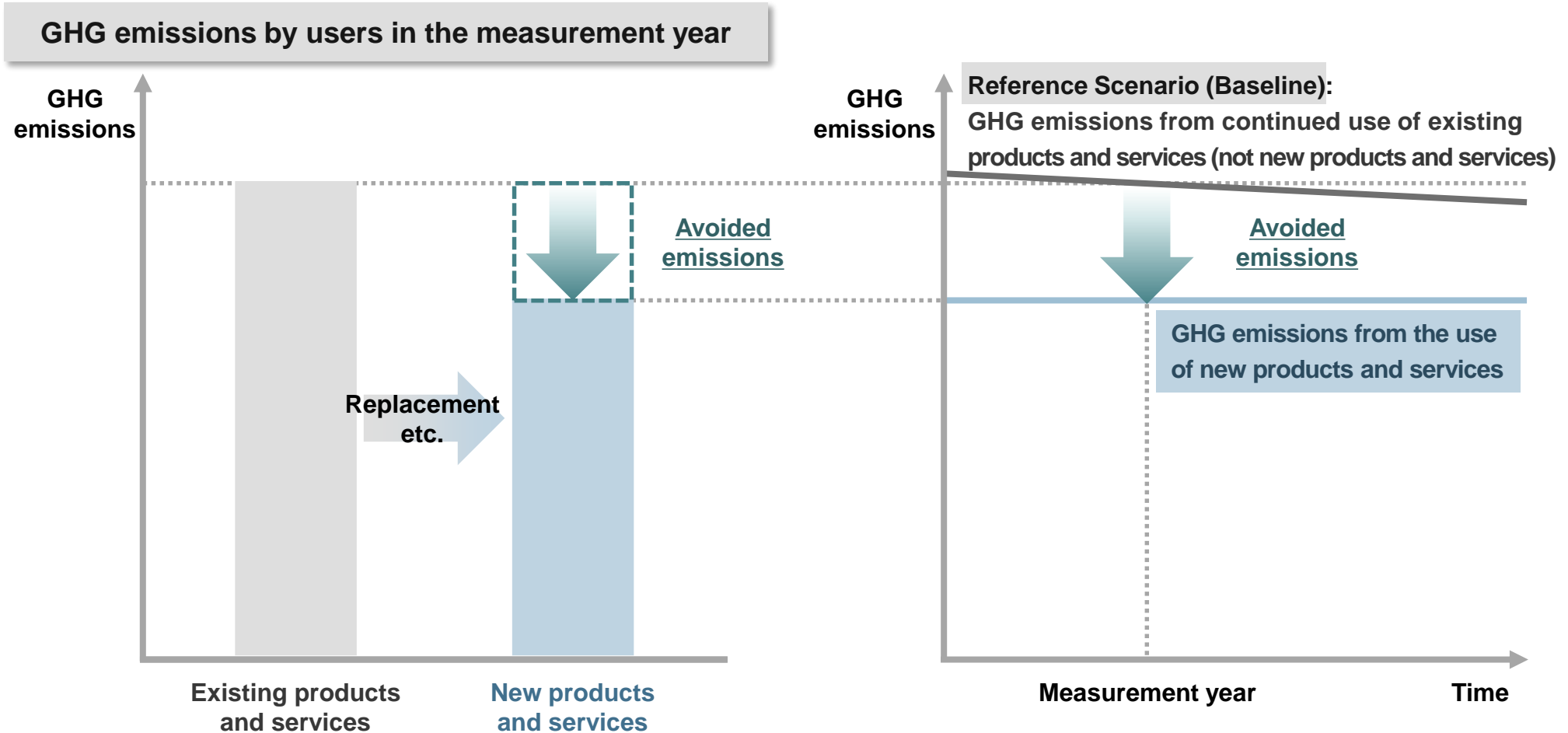


# **1. “Avoided Emissions” Becoming Focus of Global Attention**

## What is “Avoided Emissions”?

- “Avoided Emissions” (AE) is a quantitative measure of how much a company contributes to reducing GHG emissions on the user side through the use of its new products and services, compared with the existing one.

### Outline Drawing of Avoided Emissions

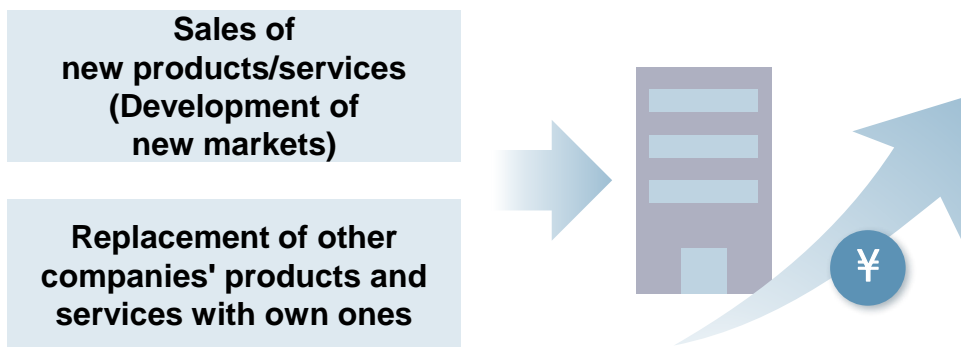


## GHG Emissions Challenges (1/2)

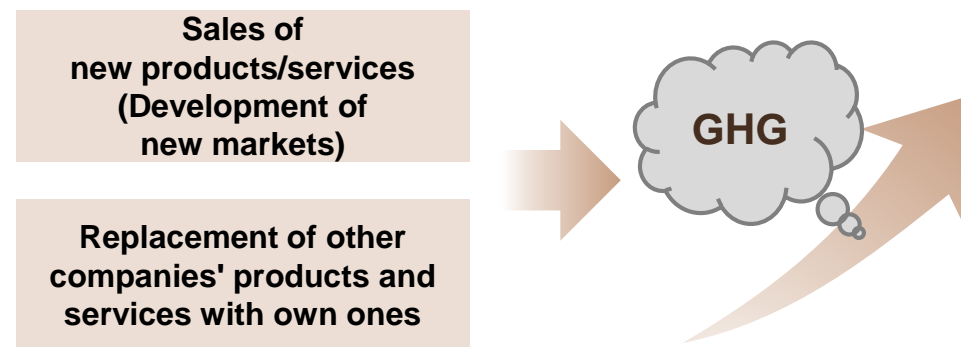
- GHG emissions are a metric that often increases when corporate production and sales volumes increase.
- GHG emissions are a good metric for assessing climate-related risks, but there are challenges in evaluating opportunities.

Changes in **Financial Accounting** due to Increased Sales of Products/Services

Changes in **Carbon Accounting** due to Increased Sales of Products/Services



**If sales of the company's products and services increase, the company's sales, profits, cash flow, corporate value, etc. can be expected to increase.**



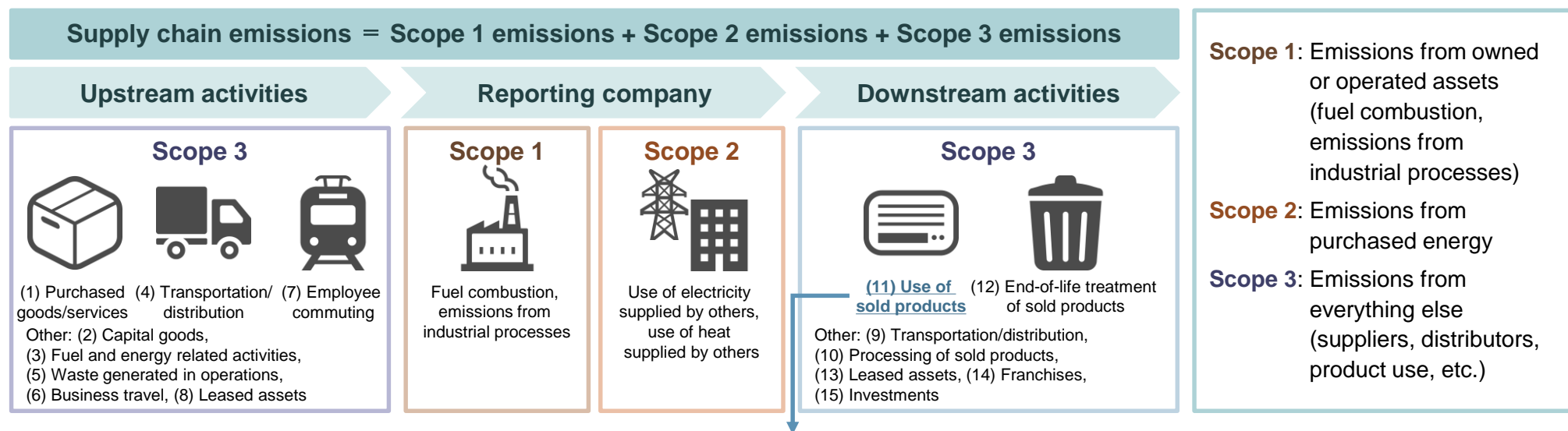
**If sales of the company's products and services increase, its own GHG emissions often increase.**

- An increase in sales of a company's products and services or an increase in its market share would normally enhance a corporate value. Therefore, analyzing responses to climate change only in terms of GHG emissions may not lead to an appropriate corporate assessment for financial institutions.
- While GHG emissions are an appropriate metric for assessing climate-related risks such as the introduction of carbon taxes and emissions trading, there are challenges in assessing climate-related opportunities (enhancement of corporate value).

## GHG Emissions Challenges (2/2)

- In the Scope 3 of companies (especially manufacturing), Category 11 (use of sold products) accounts for its majority.
- Category 11 calculations include data that is beyond the company's control or that is contrary to its corporate value.

### Supply Chain Emissions and Scope 3 Category 11



### Example Formula for Scope 3 Category 11: GHG Emissions Associated with the Use of Electric Appliances Sold

#### GHG emissions associated with the use of electric appliances sold

= **Average annual power consumption per product**

Energy consumption can be reduced through corporate energy conservation efforts.

× **Emission intensity of electricity used**

Companies cannot control the power source that consumers use.

× **Quantities sold during the reporting period**

GHG emissions increase as product sales volume increases.

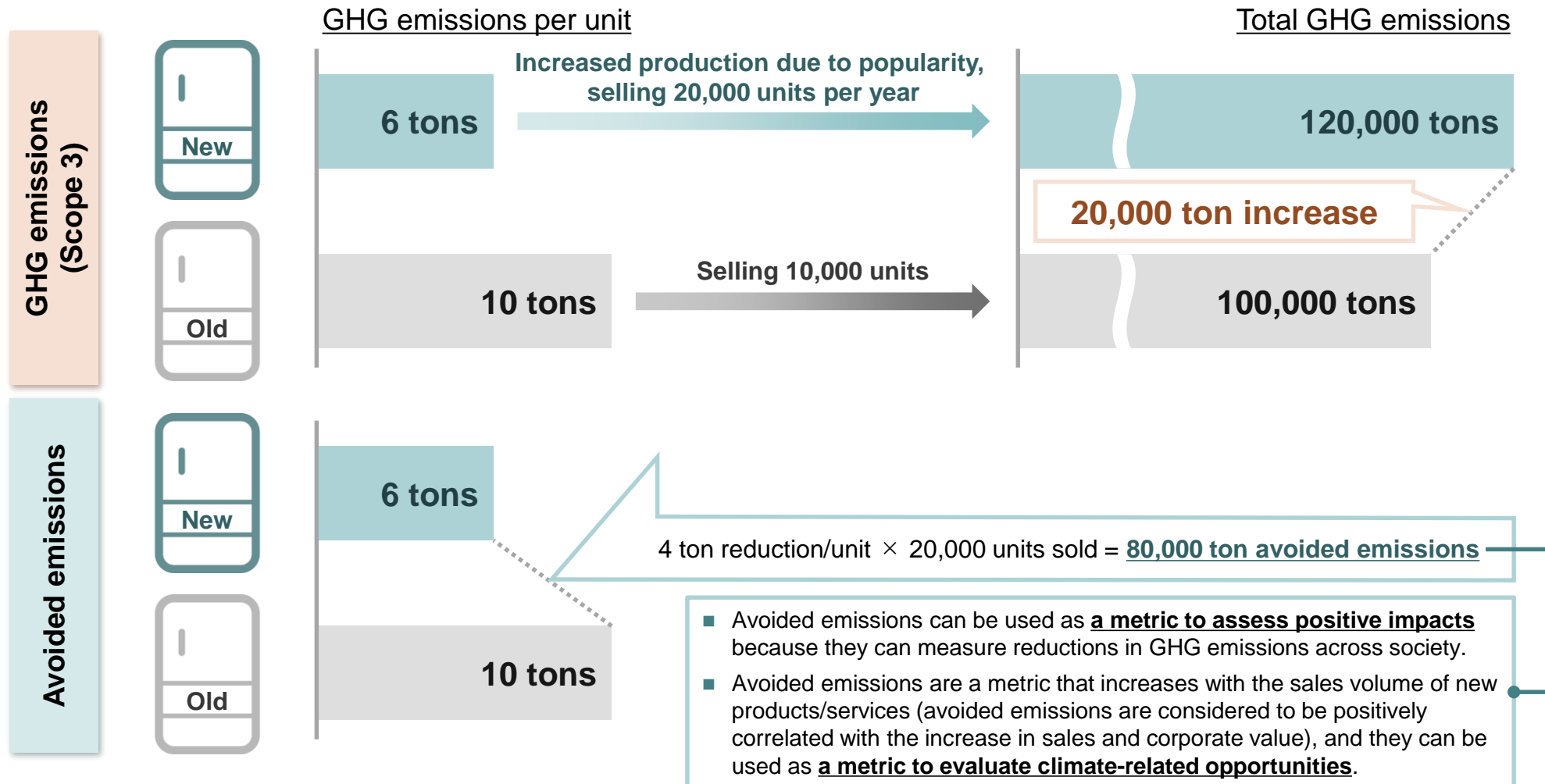
× **Average life of the product**

GHG emissions increase as manufacturing products have longer life.

## Avoided Emissions that can be Used as Metrics of Positive Impacts/Climate-related Opportunities

- AE is a different concept from GHG emissions (Scope 1, 2, 3) and cannot be deducted from them.
- Contribution of companies to reductions through increased sales of new products/services can be evaluated by AE.

### Comparison of GHG Emissions (Scope 3) and Avoided Emissions





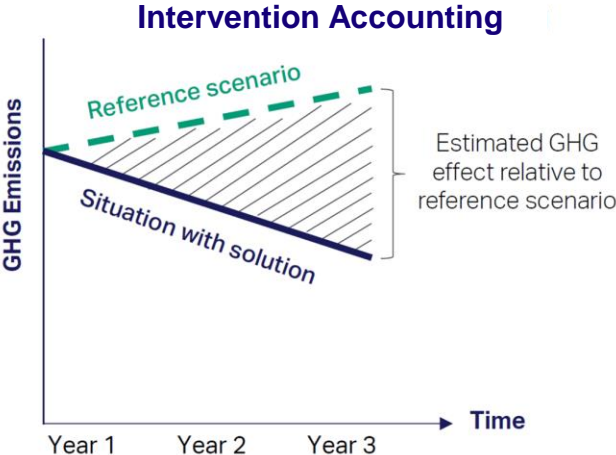
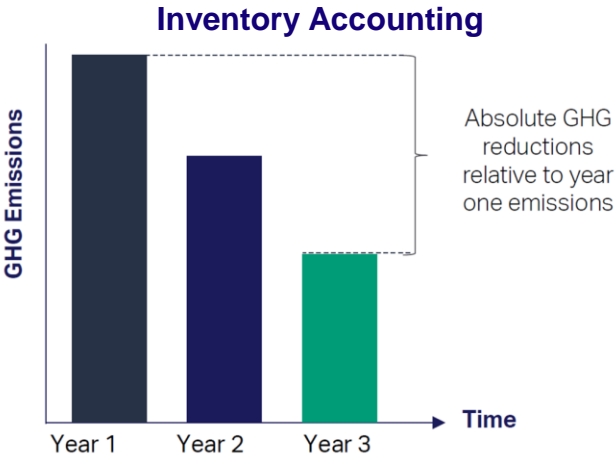
# Difference between Inventory Accounting and Intervention Accounting

- The concept of GHG emissions (Scope 1, 2, 3) in inventory accounting is different from that of AE in intervention accounting.

## Difference between Inventory Accounting (GHG Emissions) and Intervention Accounting (Avoided Emissions)

Category	Inventory Accounting (GHG Emissions)	Intervention Accounting (Avoided Emissions)
<b>Scope</b>	GHG emissions from a company's activities	GHG emissions in society
<b>Principle</b>	An assessment of annual absolute emissions from a company and its value chain	An assessment of the GHG impact of a solution provided by a company, compared to what would have occurred if the solution wasn't used (e.g., standard market solution)
<b>Time</b>	An assessment is made between two chronological points in time	An assessment is also made between two points in time, but made by comparing the solution's use to a hypothetical situation within the same time period
<b>Reference</b>	GHG emissions reductions are quantified against actual absolute emissions in a historical base year	Avoided emissions are quantified against a reference scenario
<b>Certainty</b>	The reference (historical base year) is real and accurate	The reference scenario is model-based, fictional and thus not verifiable per se
<b>Reality</b>	Emissions reductions compare the variation of a company's reported emissions over time	Avoided emissions compare the climate impact of a solution (what has happened or is expected to happen) and a reference scenario (what would have occurred without the solution)

### Difference between inventory and intervention



## Why Do Avoided Emissions Attract Attention?

- There are four main reasons why AE is the focus of attention, including the issue of GHG emissions and its attractiveness as a metric to simultaneously evaluate enhancement of corporate value and achievement of decarbonization.

### Reasons for Attention to Avoided Emissions

#### Reasons

#### Details

#### 1 Issue of GHG emissions

- GHG emissions are a metric that basically increases as economic activities and corporate business activities (production and sales volume) increase.
- In order to achieve both economic/corporate growth and reduction of GHG emissions, or to properly evaluate corporate value improvement in terms of decarbonization, it is necessary to use metrics that complement GHG emissions analyses and to introduce different time horizons (considering future projections in addition to past actual values).

#### 2 Attractiveness as a KPI and positive impact metric for enhancing corporate value and achieving decarbonization

- Companies can use avoided emissions as a KPI to enhance corporate value and achieve decarbonization at the same time.
- Avoided emissions can be used for impact metrics in impact investment/loan and sustainability performance targets (SPTs) of sustainability-linked products.

#### 3 Potential for achieving the net zero goal

- It has not been widely discussed or verified whether reducing GHG emissions in inventory accounting or increasing avoided emissions in intervention accounting could be more effective toward achieving the net zero goal.
- In addition to reducing GHG emissions, promoting efforts by companies and financial institutions to increase their avoided emissions may increase the probability of achieving the net zero goal.

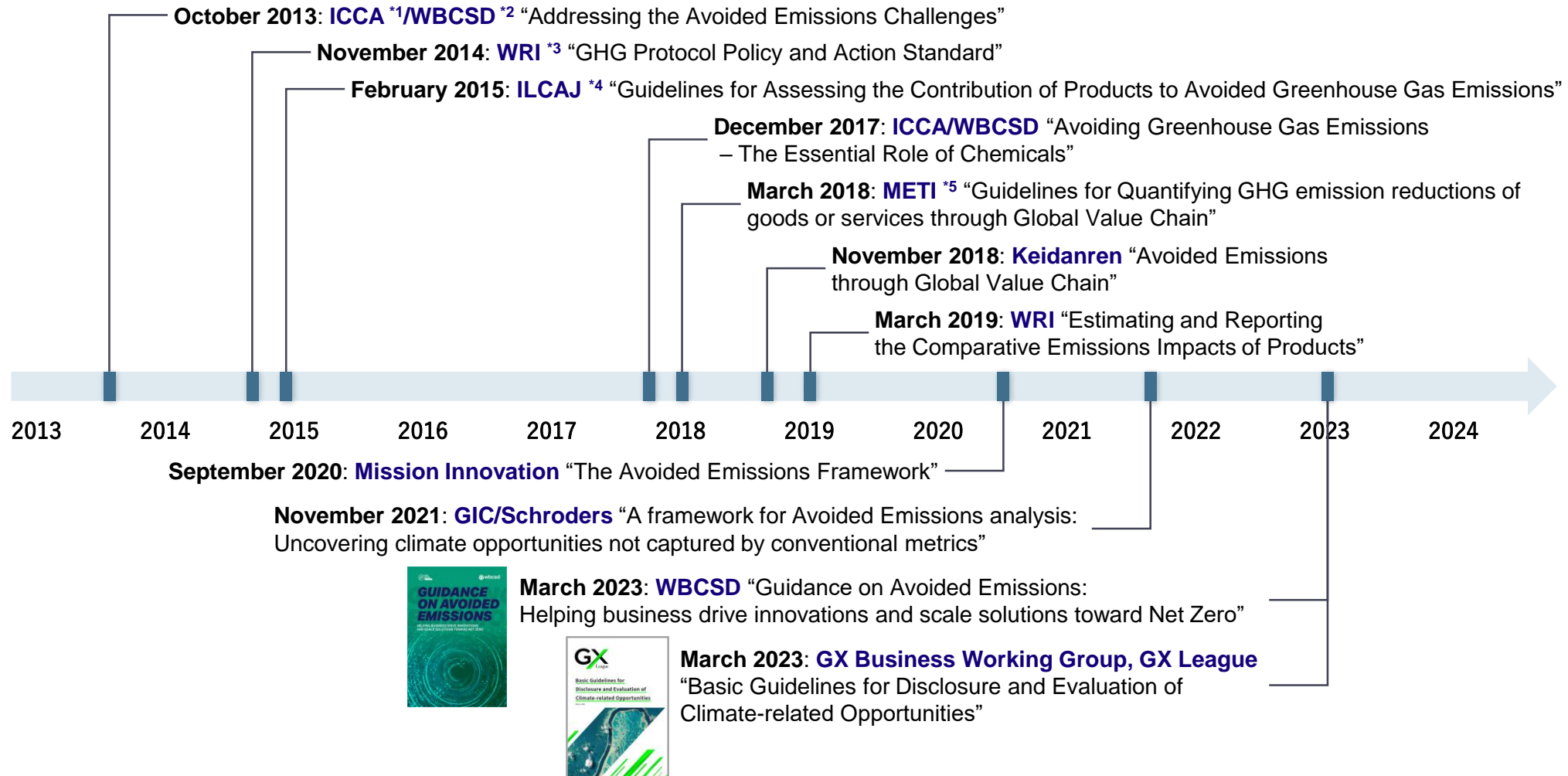
#### 4 The issue is not the "avoided emissions" itself, but the "method for calculating and disclosing avoided emissions"

- "Avoided emissions" itself is considered to be a necessary concept for achieving the net zero goal, assuming accurate measurement and disclosure.
- Constructive discussions should be held among stakeholders to establish appropriate methods for calculating and disclosing avoided emissions.

# History and Guidance/Guidelines on the Avoided Emissions

- Various organizations around the world have formulated and published guidance/guidelines on AE.
- Measurement and disclosure rules for AE considering industry characteristics are also being studied.

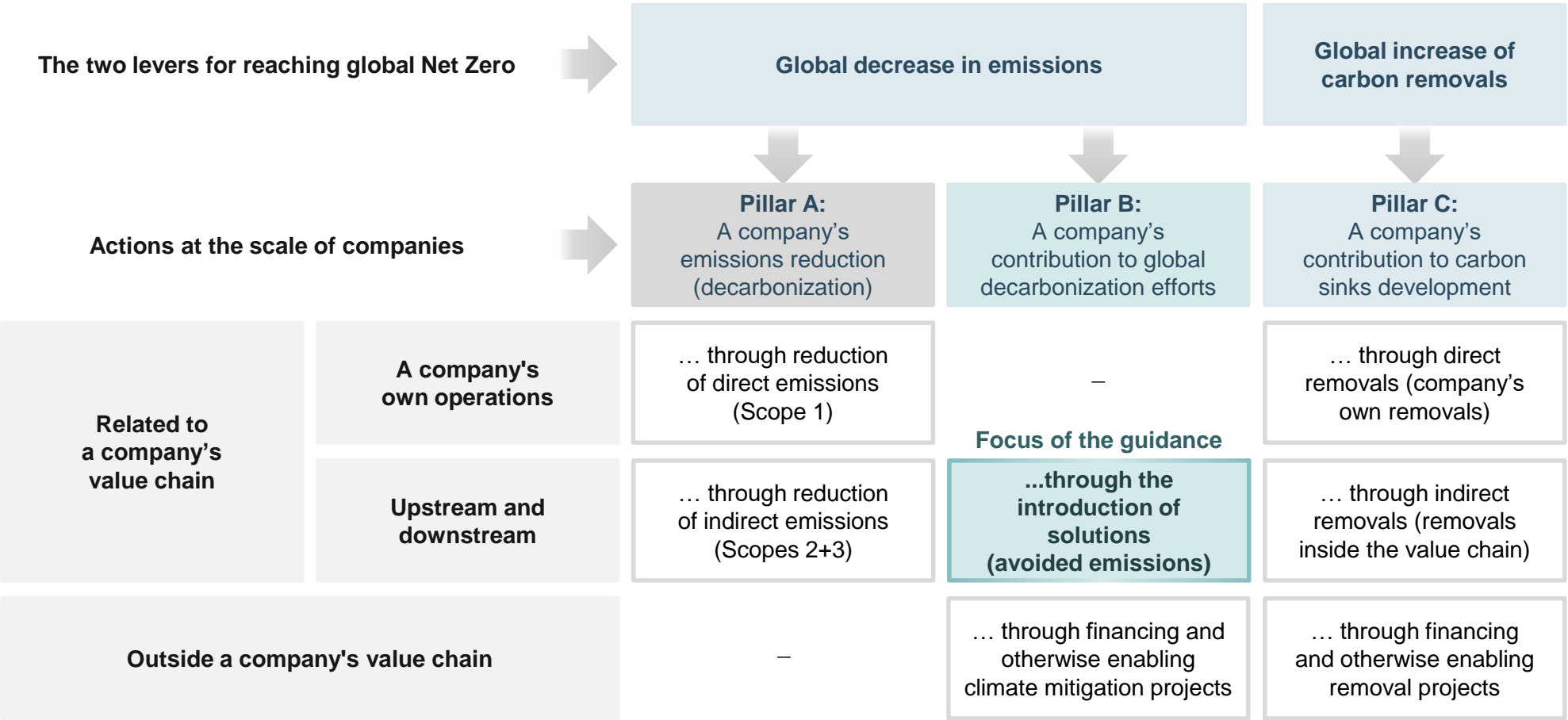
## History and Guidance/Guidelines on the Avoided Emissions



# [WBCSD Guidance] Company's Potential Contributions to the Decarbonization of the Economy

- First priority for companies is to measure and reduce GHG emissions (Pillar A), followed by claiming their contribution to global decarbonization efforts (avoided emissions, Pillar B).

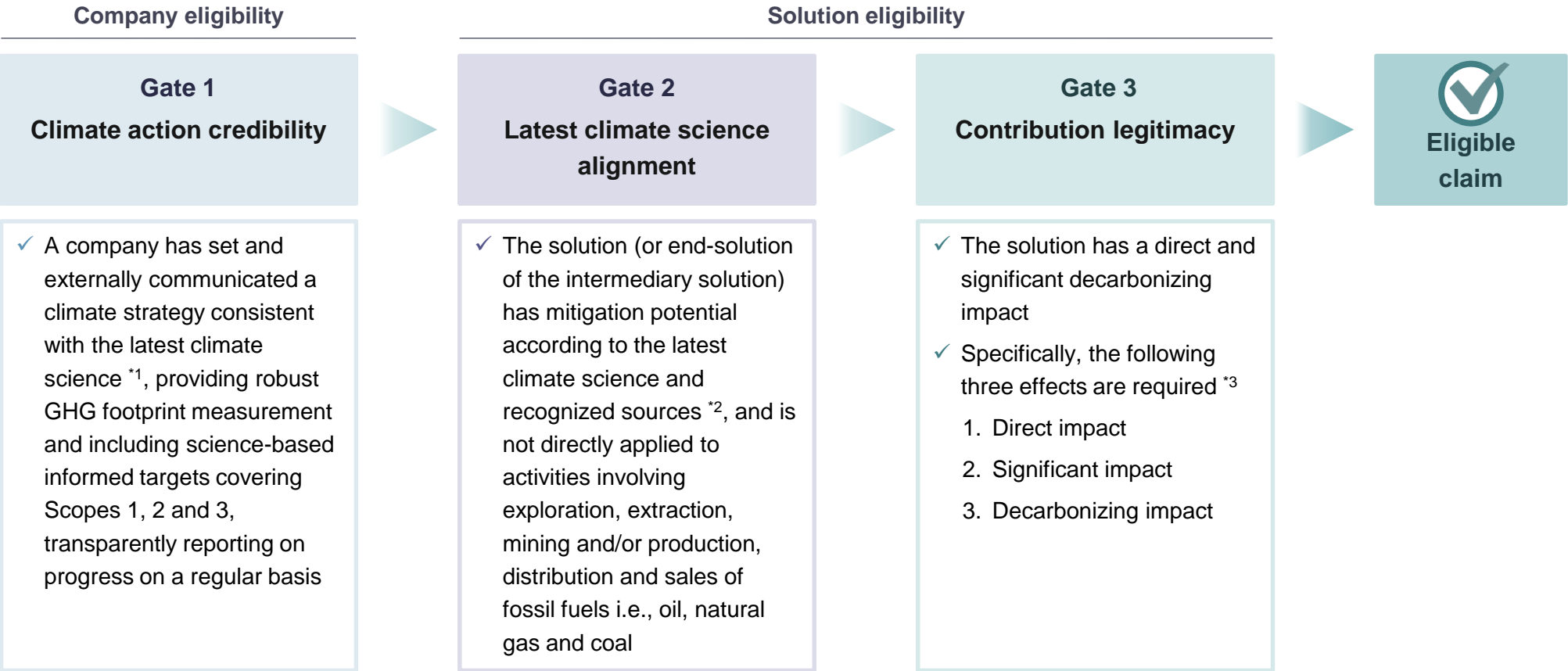
## A Company's Potential Contributions to the Decarbonization of the Economy and Focus of the WBCSD Guidance



# [WBCSD Guidance] Three Gates to Ensure the Eligibility of Avoided Emissions Claims

- Companies need to qualify themselves and their solutions according to the following three gates to claim AE.
- Companies are required to set science-based targets for GHG emissions before claiming AE.

## Three Gates to Ensure the Eligibility of Avoided Emissions Claims



\*1: SBTi Net Zero Standard requirements, UNFCCC Race to Zero and other Race to Zero accredited organizations, 1.5°C Business Playbook by the Exponential Roadmap initiative, International Energy Agency (IEA) Net Zero 2050 scenarios (as long as interim targets have also been established), Net Zero Initiative, Transform to Net Zero, ISO guidance for Net Zero, National or regional decarbonization pathways compatible with 1.5°C, SME Climate Hub Commitment/SBTi requirements for SMEs, etc.

\*2: IPCC Sixth Assessment Report (AR6), EU Taxonomy, etc.

\*3: The WBCSD guidance lists heat pumps, EV chargers supplying 100% renewable electricity, and traffic optimization systems as examples of eligible solutions. On the other hand, examples of non-eligible solutions include conventional car seats for EVs, fertilizers that release 1% less nitrous oxide compared to the average fertilizers on the market for the same results, and average concrete bases for wind turbines.

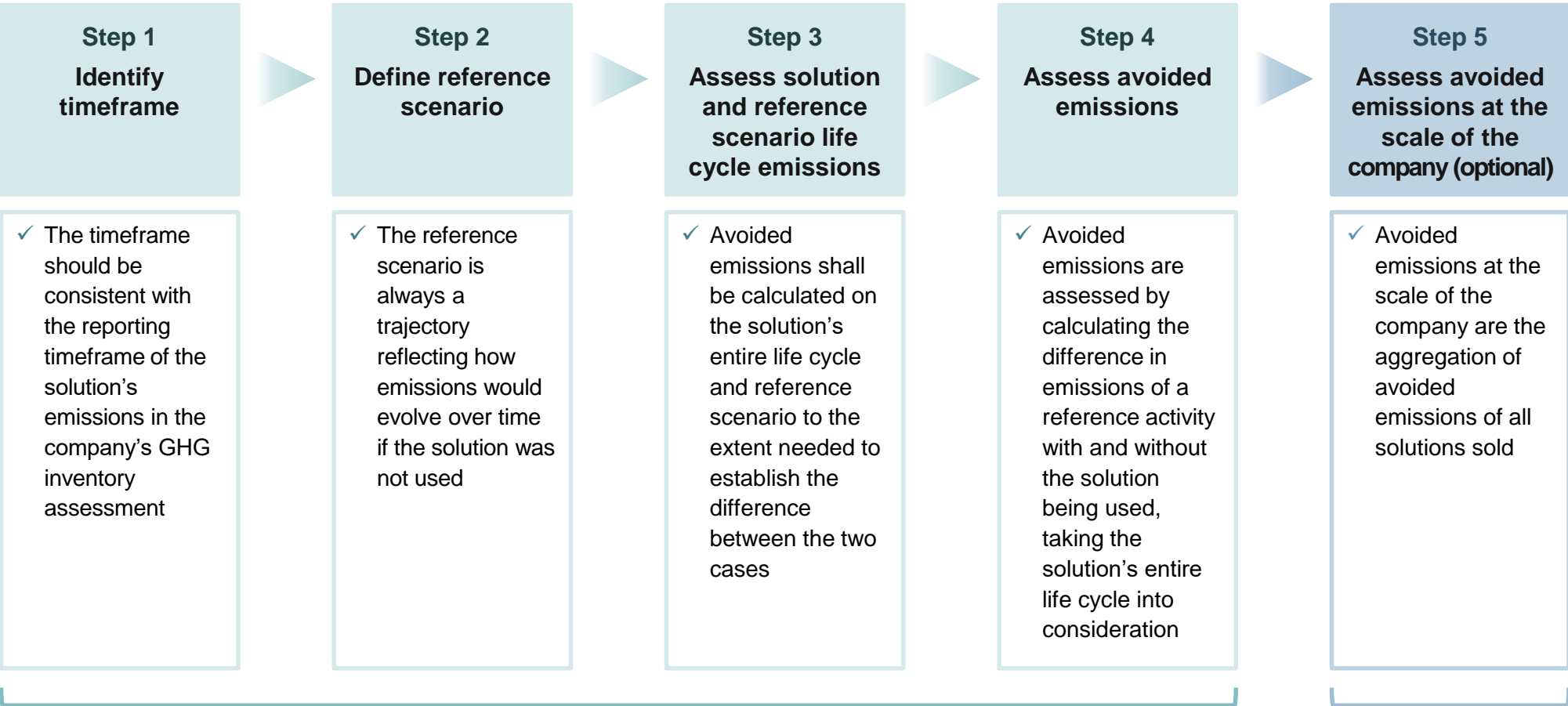
Sources: WBCSD (2024). *Avoided emissions & Sustainable finance → Accelerating decarbonization by aligning the efforts of business and finance.*, WBCSD (2023). *Guidance on Avoided Emissions: Helping business drive innovations and scale solutions toward Net Zero.*

# [WBCSD Guidance] Five Steps to Ensuring a Consistent Approach to Assessing Avoided Emissions

- To claim AE in accordance with the guidance, companies can only quantify them if they pass the three eligibility gates.
- The guidance describes the following five steps for a robust and consistent approach to calculating AE.

## Five Steps to Ensuring a Consistent Approach to Assessing Avoided Emissions

Five steps to assessing avoided emissions



At the scale of one solution

At the scale of the company

- Japanese companies can refer to GX League Basic Guidelines for measurement and disclosure of AE.
- Guidelines require own emission reduction targets, consideration of negative impacts, and transparent disclosure.

### Premises for Disclosing Climate-related Opportunities

- Basic Guidelines for Disclosure and Evaluation of Climate-related Opportunities (GX League Basic Guidelines) requires companies to meet the following requirements (1)-(3) for their emissions reduction efforts as a premises for disclosing climate-related opportunities.
  - (1) **Setting science-based emissions reduction targets**
  - (2) **Developing a transition strategy to achieve targets and ensuring its viability**
  - (3) **Disclosure of targets/strategies and their results**
- GX League Basic Guidelines summarizes the key points for climate-related opportunities disclosure as follows (1)-(5):
  - (1) **Disclose targets, strategies, and own emission reduction efforts**
  - (2) **Explain the relationship between climate-related opportunities and finance**
  - (3) **Disclose financial effect:** In cases where it is difficult to provide quantitative figures, companies may disclose qualitative information.
  - (4) **Consider negative impacts**
  - (5) **Disclose with transparency:** Disclosure that can effectively communicate with financial institutions is a disclosure that satisfies the four elements set out in TCFD; consistency, comparability, reliability, and clarity.

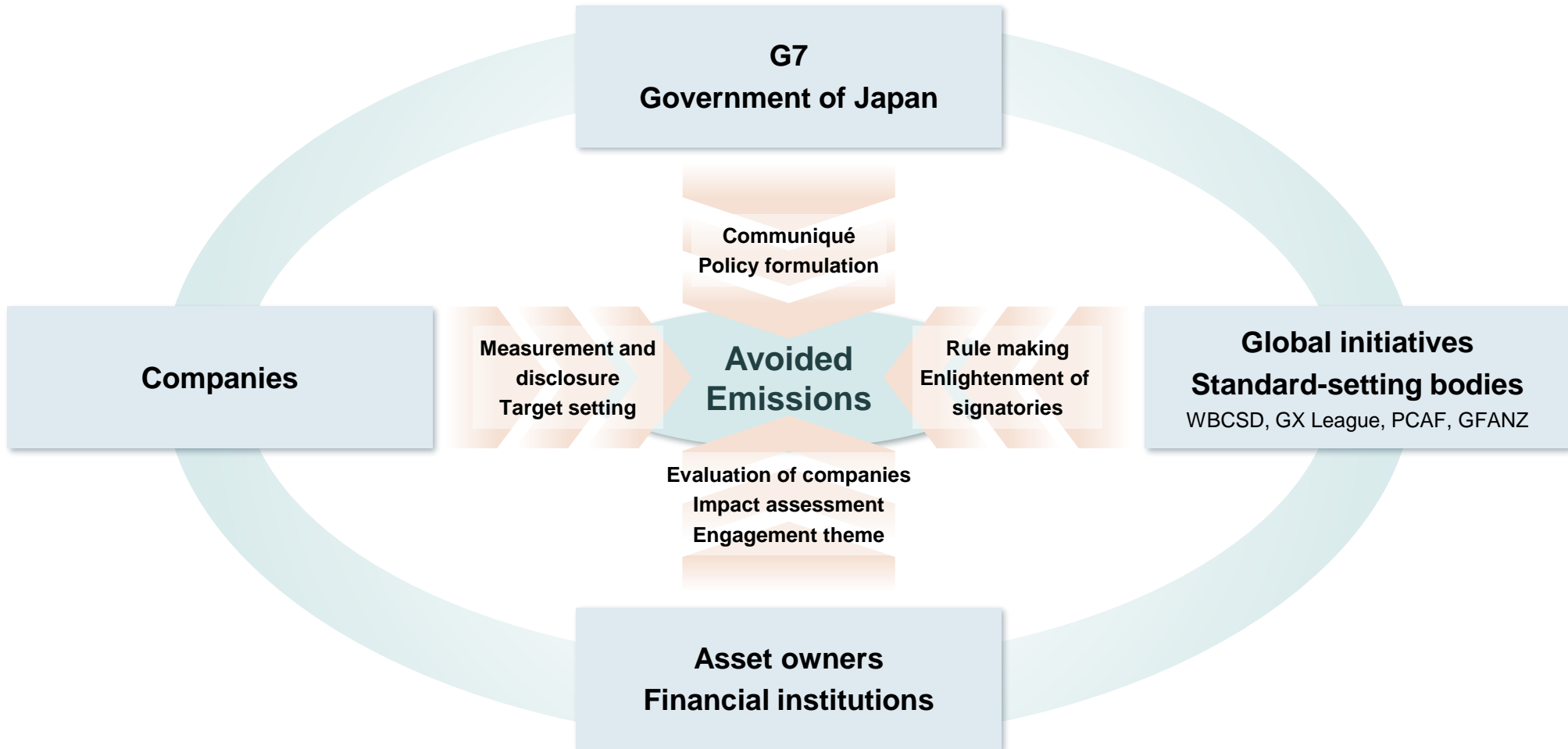
### Concept and Guidelines for AE Target Goods and Services

- The eligibility criteria of goods and services for which avoided emissions may be calculated and disclosed are as follows.
  - (1) **Alignment to the achievement of carbon neutrality:** The goods and services must be in line with the targets of the Paris Agreement or latest climate science.
  - (2) **Goods and services have legitimacy in the reduction:** There should be a clear indication that the goods and services are related to reduction factors of emissions. Avoided emissions not only cover final products, but also the components.
- The following is four principles for disclosing avoided emissions.
  - (1) **Clear distinction from GHG inventories**
  - (2) **Meeting eligibility:** Goods and services, for which avoided emissions are calculated, should meet eligibility, with companies' commitment to their own emissions reduction.
  - (3) **Consideration of negative impacts due to the supply of such goods and services**
  - (4) **Transparent disclosure:** For easier evaluation for financial institutions, it is recommended that methodologies and disclosure locations be kept consistent. However, since methodologies and other frameworks are under development, any changes over time are recommended to be disclosed.\*<sup>1</sup>

## Avoided Emissions Becoming Focus of Global Attention

- Various stakeholders around the world shown in the figure below are raising their interest in AE.
- Expected that further strengthening of cooperation among stakeholders will accelerate the spread and expansion of AE.

### Stakeholders Focusing on Avoided Emissions





- **G7 Ministers' Meeting on Climate, Energy and Environment was held from April 15 to April 16, 2023 in Sapporo City, Hokkaido, Japan, and the Communiqué mentioned "There is also value in acknowledging AE".**

## 2023 G7 Climate, Energy and Environment Ministers' Communiqué

### 51. Perspective to realize emission reduction throughout the value chain:

We stress the importance of and prioritize continuous efforts by various entities to make immediate, rapid and sustained GHG emissions reductions for themselves and throughout the value chains to keep a limit of 1.5°C temperature rise within reach. We encourage more positive climate action, including in the private sector, and encourage entities to commit to GHG net-zero emissions for themselves and throughout the value chains. We recognize the work of the United Nations high-level expert group on the Net Zero Emissions Commitment of non-state entities, including in particular for the credibility of private net zero pledges. **There is also value in acknowledging the contribution of a certain entity to emission reductions of other entities by providing decarbonization solutions in a given system, in other words "avoided emissions".** (see annex "Conclusions regarding the Industrial Decarbonisation Agenda" part B) **We note the World Business Council For Sustainable Development's first version of the guidance on avoided emissions in March as a private sector contribution to the discussion, and that a trusted mechanism may mobilize financial resources to accelerate the deployment of solutions.** We stress that claims on the environmental performance of various entities should be reliable, comparable and verifiable to empower consumers, companies and investors to accelerate efficient emission reductions and reduce the risk of inappropriate use in line with the principles decided in the conclusions of the G7 Industrial Decarbonisation Agenda (IDA).

## "Conclusions regarding the Industrial Decarbonisation Agenda" Part B

### Part B: Appropriate evaluation of avoided emissions towards net zero society

We stress the importance and recognize as priority continuous efforts by various entities in immediate, rapid and sustained GHG emissions reductions for themselves and throughout the value chains to keep a limit of 1.5°C temperature rise within reach. In order to encourage more positive climate action, including in the private sector, and encourage entities to commit for themselves and throughout the value chains on their path to GHG net-zero emissions, **there is also value in acknowledging the contribution of a certain entity to emission reductions of other entities by providing decarbonisation solutions in a given system, in other words "avoided emissions".**

The discussion of avoided emissions is already arising in the private sector, as a potential mechanism to facilitating innovation and scale-up investment in clean goods and services, which are key for realizing the necessary emissions reductions and achieving our climate goals, but until now there has been no widely recognized standardized method of calculation or reporting such as the GHG Protocol for the measuring of SCOPE1-3 emissions. **A shared, international standard for measuring avoided emissions is recommended to enable a common understanding and reduce the risk of inappropriate use of avoided emissions.**

(...)

[Usage] 2. (In recognizing the potential value of avoided emissions, we acknowledge that this) is expected to be used as an additional perspective to **promote/facilitate/provide recognition of the diffusion of clean goods and services needed globally to reach net-zero. e.g.) Promoting investment from financial sectors by evaluating and unlocking the value from companies/solutions with high contribution to global emission reductions. Financial sectors can make use of this information to assess the company's climate-related opportunities and to formulate financial instruments for promoting investment.** Furthermore, it can also be used as a key metric to support decision-making within a company to prioritize and scale the deployment of solutions in markets with the greatest decarbonisation potential.

(...)

- On June 12, 2024, WBCSD released an AE insight paper “Avoided emissions & Sustainable finance”.
- It comprehensively explains finance, guidance, good practices/issues, regulations/standards related to AE.

## WBCSD “Avoided emissions & Sustainable finance → Accelerating decarbonization by aligning the efforts of business and finance”

- The four purposes of this insight paper are as follows.
  - (1) Provide practical guidance and case examples how companies and financial actors can leverage avoided emissions solutions across asset classes and financial instruments
    - Private equity and venture capital
    - Public equity and bonds
    - Sustainability-linked loans
    - Green bonds and project finance
  - (2) Demonstrate the added value of avoided emissions perspectives in the context of low-carbon solution financing and wider net-zero emissions trajectories
  - (3) Discuss good practices and current challenges in avoided emissions assessments, attribution and reporting for companies and financial institutions
  - (4) Provide an overview of the current regulatory and (voluntary) standards landscape for financial actors and companies in the avoided emissions context
- Another feature of this insight paper is that global climate-related initiatives such as **GFANZ, PCAF, and the GX League are cooperating as knowledge partners.**



## [Global initiatives/Standard-setting bodies] GX League Avoided Emissions Case Studies

- GX Business Working Group, GX League, prepared “AE Financial Institution Case Studies” and announced it at COP28.
- In May 2024, “Hypothetical Cases for AE Disclosure” was published as a reference for business companies.

### Leveraging Avoided Emissions: Financial Institution Case Studies



- The GX League prepared this case studies of financial institutions' use of avoided emissions to further disseminate avoided emissions, one of the disclosure items for assessing climate-related opportunities.
- In addition to introducing four types of examples of how avoided emissions are used by various financial institutions, such as asset owners, asset managers, and banks, in corporate and portfolio evaluations, the case studies also include interviews with financial institutions on the background of their use.
- GX League held discussions with the WBCSD, which published the Guidance on Avoided Emissions in March 2023, to disseminate avoided emissions globally.

### Hypothetical Cases for Avoided Emissions Disclosure



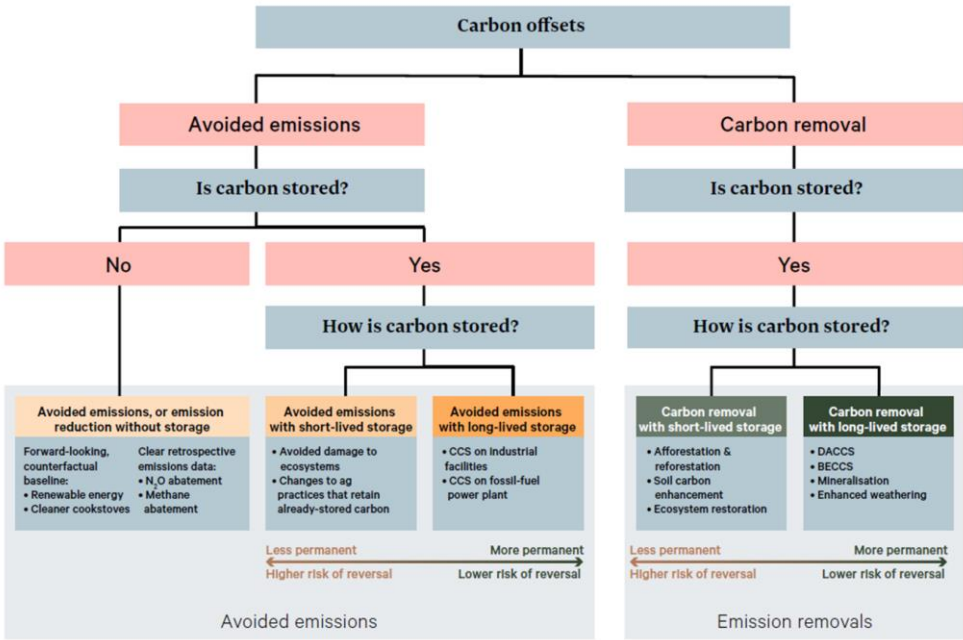
- In order to further promote the disclosure of avoided emissions, the GX League collected and created hypothetical cases for avoided emissions disclosure, referring to their actual disclosure by business companies.
- This hypothetical cases explain the key points when companies measure and disclose avoided emissions in accordance with the Basic Guidelines for Disclosure and Evaluation of Climate-related Opportunities, and is positioned as a supplementary document to the Basic Guidelines.

# [Global initiatives/Standard-setting bodies] Utilization of Avoided Emissions in the PCAF and GFANZ

- PCAF Standard Part A allows financial institutions to disclose Financed AE only for renewable energy projects.
- GFANZ exemplifies AE as one of the metrics to measure the future GHG reduction impact of climate solutions.

## Utilization of Avoided Emissions in the PCAF

- PCAF (Partnership for Carbon Accounting Financials) is a global partnership of financial institutions that aims to develop a standardized for measuring and disclosing GHG emissions related to financial institutions' investments and loans (Scope 3 Category 15 Financed Emissions).
- PCAF Standard Part A allows financial institutions to measure and disclose Financed Avoided Emissions only for renewable energy projects.
- Financial institutions must disclose Financed Avoided Emissions separately from the GHG inventory (Scope 1, 2, 3).



## Utilization of Avoided Emissions in the GFANZ

- GFANZ (Glasgow Financial Alliance for Net Zero) is an international coalition of net zero alliances and initiatives in each financial sector.
- As a decarbonization contribution of transition finance, GFANZ provides the example of avoided emissions as one of the forward-looking metrics to measure the Expected Emission Reductions (EER) of climate solutions which are the key transition financing strategy.

### Part I – Refines Attributes for identification of the four key transition financing strategies

**CLIMATE SOLUTIONS**

- A. Real-economy emission reduction
- B. Expectations of net-zero alignment

**ALIGNED**

- A. Established net-zero commitment/ambition
- B. Established net-zero targets (set to pathway)
- C. Net-zero transition plan (or phaseout plan)

**ALIGNING**

- D. Additional KPIs (where applicable)
- E. Performance

**MANAGED PHASEOUT**

### Part II – Outlines quantification methods for decarbonization contribution

**Introduces the concept of Expected Emission Reductions (EER) which are calculated using different methodologies, depending on the transition financing strategy.**

**Avoided Emissions**  
based on Life Cycle Analysis

**Emissions Reduction Potential**

**For both methods, EER calculation encompasses three steps:**

**1. Benchmark**

**2. Projection**

**3. Calculation**



- **Government Pension Investment Fund (GPIF) utilizes AE for analysis and impact assessment of investee companies.**
- **Norges Bank Investment Management (NBIM) refers to the analysis of AE in the expectations for investee companies.**

### Government Pension Investment Fund (GPIF)

- GPIF, one of the world's largest asset owners, conducted its first analysis of avoided emissions in the "2020 ESG Report" published in August 2021. This is an "Analysis of Inter-Industry Transfer of Transition Risks and Opportunities", performed by Astamuse, using data on industry-level required GHG reductions, expected avoided emissions of individual decarbonization technologies, and projections for the rate at which they will be implemented in society.
- In the "2022 ESG Report" released in August 2023, GPIF conducted a "Analysis of Avoided Emissions Based on the Bottom-up Approach" in cooperation with ICE (Intercontinental Exchange Group). GPIF focused on two products and services where the methodology is easily understandable and companies disclose the information necessary to calculate avoided emissions: "zero emission vehicles" and "utilities (renewable energy)".\*1
- The GPIF's "2023 ESG Report" released in August 2024 analyzed avoided emissions from the domestic renewable energy facilities in its infrastructure portfolio and verified avoided emissions and greenium (green premium) impact in Euro-denominated bonds.

### Norges Bank Investment Management (NBIM)

- NBIM, which manages the Norwegian Government Pension Fund, published its latest "Climate change: Expectations of companies" in September 2023, highlighting the need for companies to move from setting targets to developing transition plans.
- In the avoided emissions and lifecycle analysis of the foundations of corporate climate strategy, expectations were expressed that "To demonstrate the emissions benefits of their products or services, **companies are encouraged to use lifecycle emissions and avoided emissions analysis.** Such disclosures should be made in addition to Greenhouse Gas Protocol reporting. The major assumptions underpinning the calculations should be disclosed."
- On the other hand, in the decarbonisation strategy of transition plans, it is stated that "Companies should implement and disclose time-bound and quantified decarbonisation strategies. Details should include specific abatement measures needed to reach their interim emission reduction targets, including internal abatement measures, divestments, output changes, carbon credits and contractual instruments such as RECs (Renewable Energy Certificates). Avoided emissions should not be included in a decarbonisation strategy." and it is recommended that avoided emissions should not be used for the decarbonisation strategy (reduction plan of GHG emissions).

\*1: In the report "ICE Avoided Emissions ~ Analysis of GPIF Portfolio ~", which was analyzed by ICE for the preparation of the ESG Report 2022, "mined minerals" was also analyzed in addition to "zero emission vehicles" and "utilities".

Sources: GPIF (2021, 2023, 2024). *2020 ESG Report*, *2022 ESG Report*, *2023 ESG Report*, NBIM (2023). *Climate change: Expectations of companies*.

- In May 2023, European investors called for the establishment of a global database of AE.
- Announced in January 2024 that I Care and Quantis were selected to build a database of AE factors.

### Announcement of Developing Avoided Emissions Global Database

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- While the data currently shared by companies on their direct GHG emissions and estimated indirect emissions (scope 2, scope 3) is based on solid methodological foundations, other metrics are needed to identify their respective contributions and to be able to compare solutions.
- The creation of a standard for a global database of emission avoidance **factors** is therefore a major step forward for many economic players. For the financial sector, this initiative will generate estimates of the emissions avoided by the activities financed, making them transparent and comparable. When such estimates are implemented in a standardized way across a wide range of solutions, they will enable investment to be channeled towards the solutions with the greatest potential for decarbonization, depending on where they are located.
- The database built by I Care by Bearing Point and Quantis will initially cover 80 specifically defined low-carbon solutions (examples: biomass energy, recycled plastic, low-carbon concrete, etc.). The geographical differentiation of the reference scenarios taken into consideration for each solution and the various links in the value chains of these solutions will result in the creation of ca. 9,600 distinct avoidance factors during this first phase, which will end in Q4 2024.
- Each emission factor will contain details of the assumptions made, in particular: functional unit used, carbon footprint of the solution, reference scenario used, lifespan of the solution, time value of carbon, and rebound effect. For all these parameters, precisely sourced default values will be provided and updated on an annual basis. The scope of the database will also be gradually extended to include many other low-carbon or green enabling solutions. The development of the database and the choice of methodologies will be overseen by a scientific committee comprising the main organizations behind the current standards for avoided emissions.
- Development of the database will commence in January 2024 and a first version will be made available to all stakeholders with a requirement to calculate avoided emissions in Q4.

# 【Companies】 Disclosure of Avoided Emissions by Japanese Companies (FY2023) (1/2)

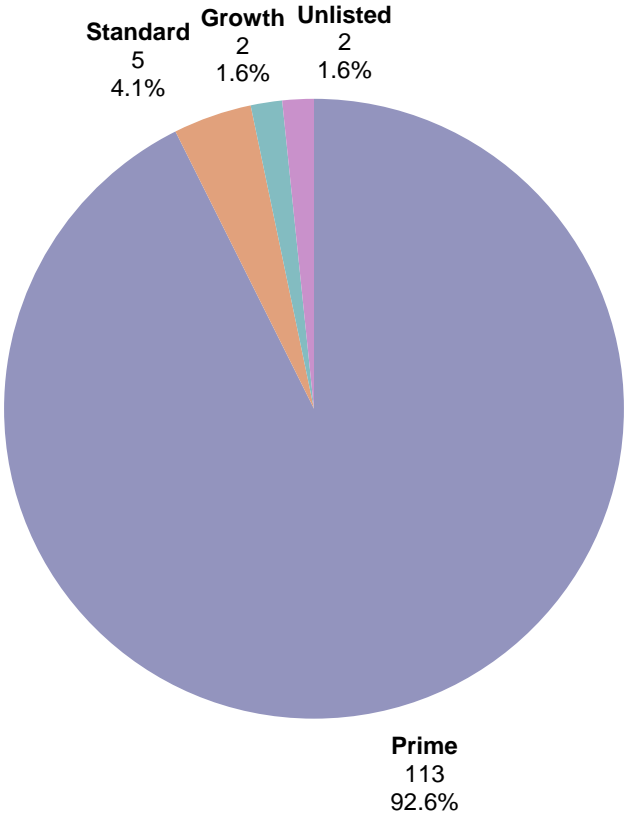
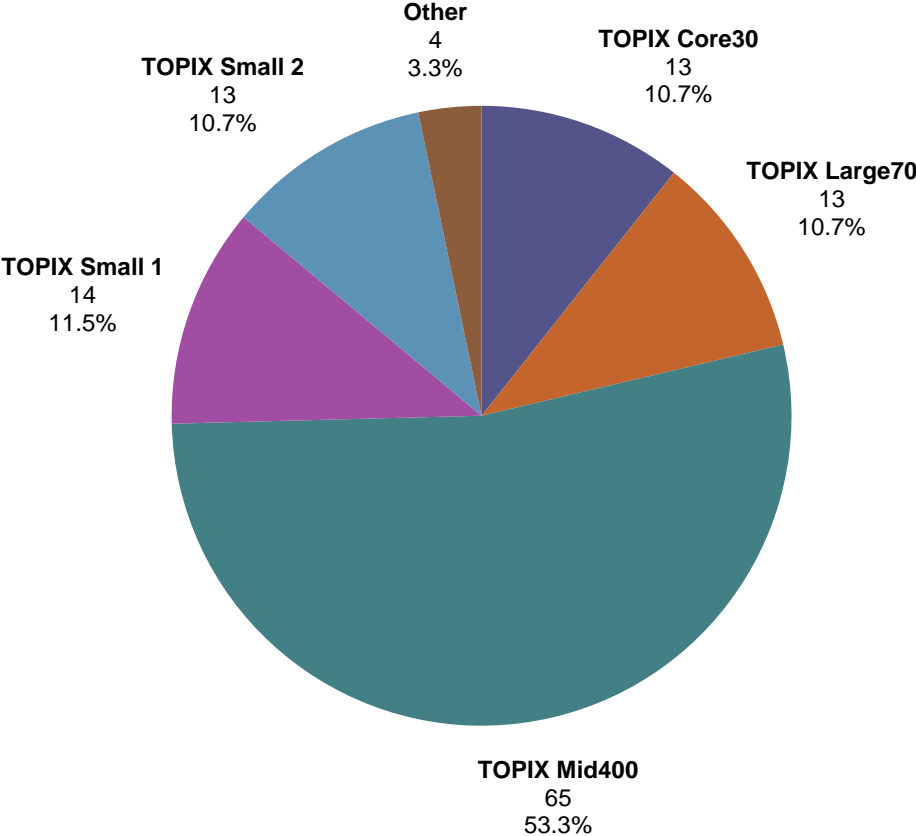
- Mizuho researched mainly TOPIX 500 \*1 Japanese companies on AE disclosed in integrated reports, etc. in FY 2023 \*2.
- 91 companies of TOPIX500 and 31 companies of non-TOPIX500 disclosed AE, and the number is increasing.

**Number of Companies Disclosing AE (Company Size/FY2023)**

**Number of Companies Disclosing AE (Listed Market/FY2023)**

(N = 122 Japanese companies disclosing avoided emissions  
= 91 companies of TOPIX500 + 31 companies of non-TOPIX500)

(N = 122 Japanese companies disclosing avoided emissions  
= 91 companies of TOPIX500 + 31 companies of non-TOPIX500)



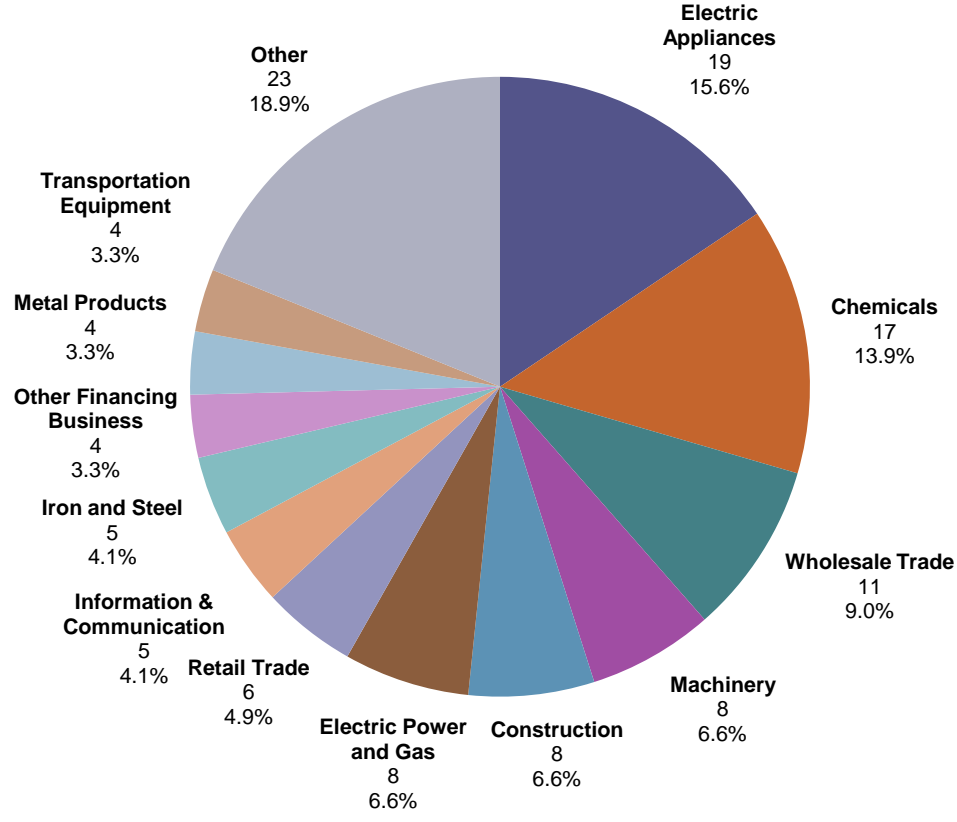
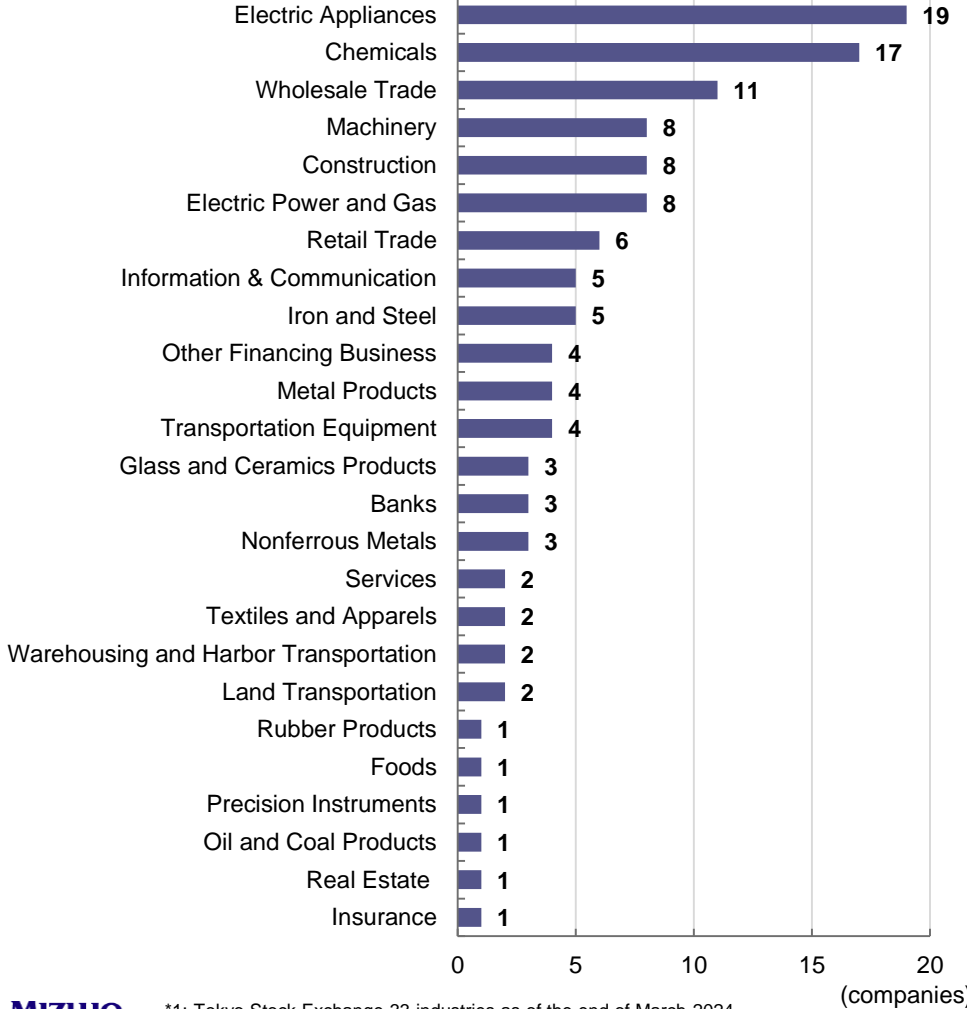
\*1: TOPIX500 stocks, size categories, and listed markets as of the end of March 2024.  
\*2: Avoided emissions disclosed from April 2023 to March 2024.  
Sources: Each company's disclosure.

# [Companies] Disclosure of Avoided Emissions by Japanese Companies (FY2023) (2/2)

- Among TSE 33 industries \*1, Electrical Appliances accounted for the largest share, with 19 companies disclosing AE.
- Chemicals came in second with 17 companies, and Wholesale Trade came in third with 11 companies.

## Number of Companies Disclosing Avoided Emissions (TSE 33 Industries/FY2023)

(N = 122 Japanese companies disclosing avoided emissions = 91 companies of TOPIX500 + 31 companies of non-TOPIX500)



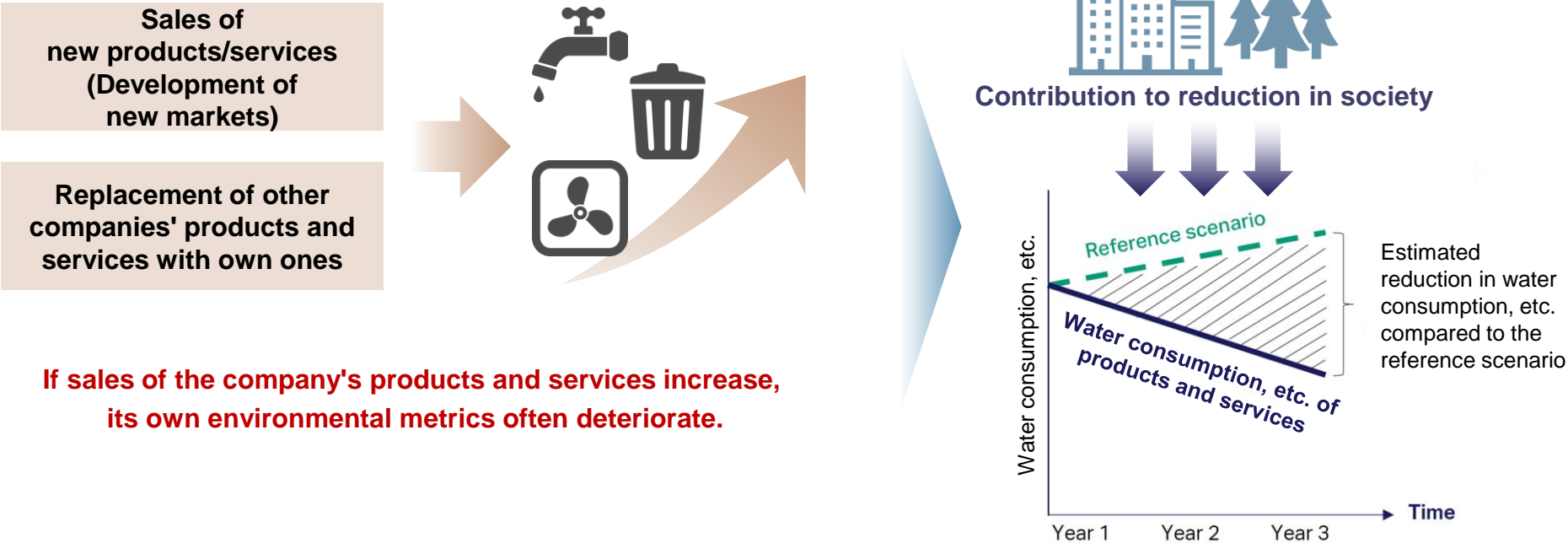


# [Companies] Avoided Metrics Extending from GHG Emissions to Areas such as Water, Waste, and Pollutants

- As corporate production/sales increase, other environmental metrics, as well as GHG emissions, tend to deteriorate.
- Some companies have begun to disclose metrics similar to avoided emissions for water, waste, and pollutants.

## Avoided Metrics (similar to Avoided Emissions) for Water, Waste, and Pollutants etc.

- Examples of avoided metrics for water, waste, and pollutants are shown below.
  - **Water:** Contribution to the reduction of water consumption in society by avoiding water consumption through the use of its products and services
  - **Waste:** Contribution to the reduction of waste in society by avoiding waste through the use of its products and services
  - **Pollutants such as PM2.5:** Contribution to the reduction of pollutants in society by avoiding pollutants through the use of its products and services
- In the case of environmental metrics, it is basically possible to consider avoided metrics using the concept of intervention accounting in the same way as GHG emissions.



**If sales of the company's products and services increase, its own environmental metrics often deteriorate.**

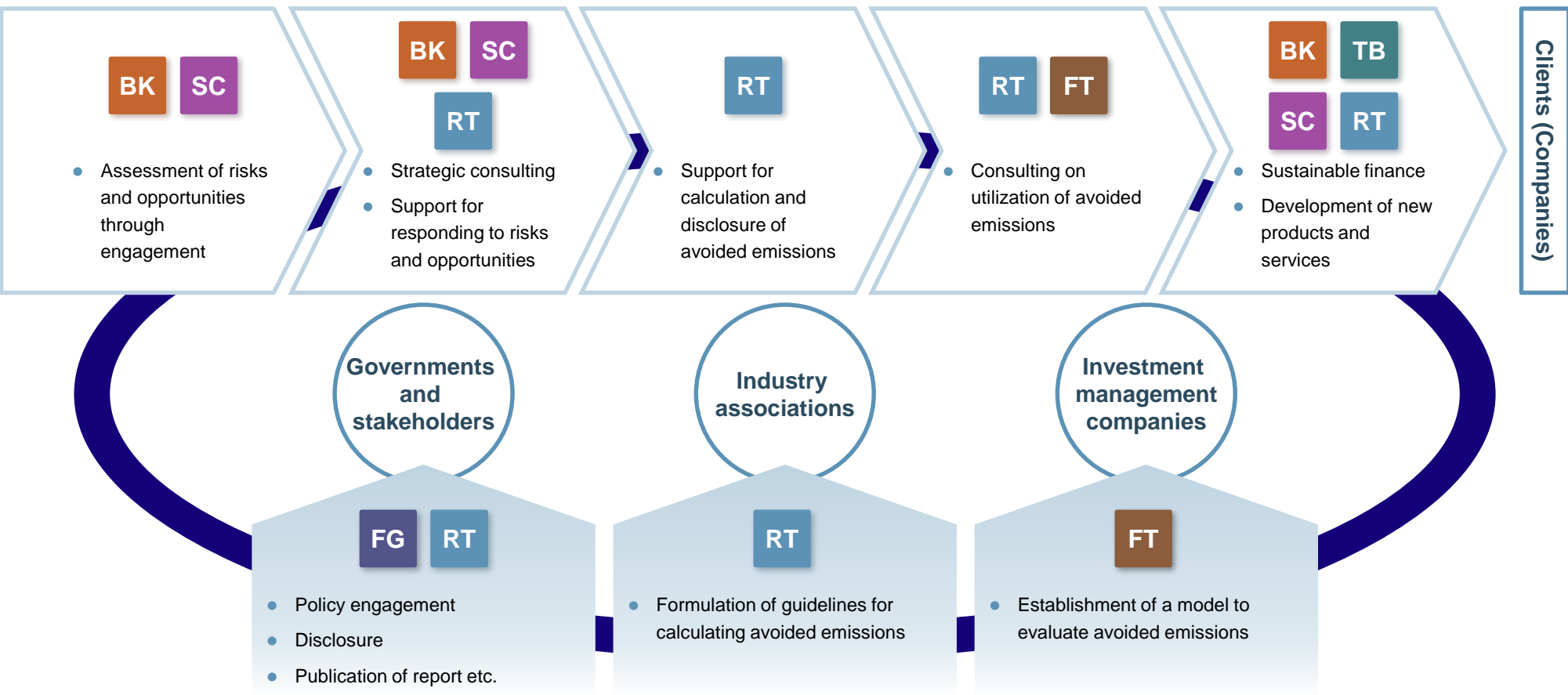


## **2. Mizuho's Achievements in Avoided Emissions**

# [Mizuho Financial Group] Mizuho's Value Chain for Avoided Emissions

- Mizuho has built a value chain for AE, and contributes to establishment of its rules and evaluation models.
- We also provide full support to our clients for AE pre-assessment, measurement/disclosure support, and financing.

## Mizuho's Value Chain for Avoided Emissions \*1



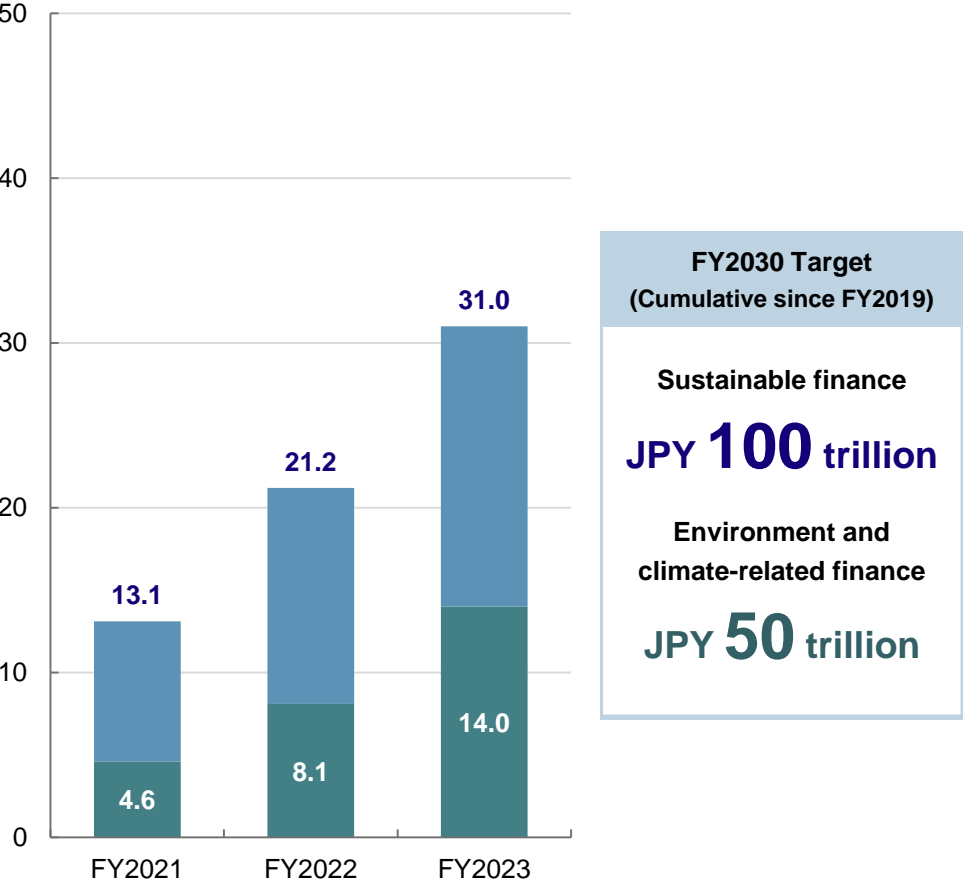
## Mizuho's Value Chain for Avoided Emissions

# 【Mizuho Financial Group】 Sustainable Finance Targets and Results

- Mizuho has set a sustainable finance target of JPY 100 trillion, of which JPY 50 trillion is earmarked for environment and climate-related finance, recognizing our important role is to respond to the enormous financing needs of climate change.

## Sustainable Finance Results

(Amount of sustainable finance: JPY in trillions, cumulative since FY2019)



■ Total amount of environment and climate-related finance

## League Table

Global

Japan

**No. 1**  
(Among Japanese banks)



**Sustainable finance (loans)**

(April 2023 to March 2024)

Five successive years  
**No. 1**



**Publicly offered SDGs bonds**

(April 2019 to March 2024)

## [Mizuho Bank] Sustainability-linked Loans with Avoided Emissions Set as SPTs

- Mizuho Bank has served as the arranger for sustainability-linked loans (SLL) which set AE as the sustainability performance target (SPT).

### Sustainability-linked Loans whose SPT is Avoided Emissions for which Mizuho Bank Served as Arranger

- An SLL is a loan designed to motivate a borrower to meet ambitious SPTs based on the borrower's Key Performance Indicators (KPI) and to link the loan's terms and conditions to the borrower's achievement of these SPTs.
- By forming SLL in which avoided emissions are set as the SPT by Mizuho Bank, it is possible to create positive impact and promote transition to achieve the SPT.

#### Example of SLL Setting Avoided Emissions as SPT for which Mizuho Bank Served as Arranger

Borrower	Time of loan execution	Loan term	Loan amount	SPTs related to avoided emissions
Tokyo Century Corporation	September 2021	5 years	JPY 22.5 billion	<ul style="list-style-type: none"> <li>● Achieve the annual power generation and CO2 avoided emission targets of Kyocera TCL Solar LLC's solar power generation business</li> <li>● Achieve the assumed GHG avoided emission (cumulative) target of the Joint Crediting Mechanism (JCM)</li> </ul>
	March 2022	3 years and 9 months	JPY 55.2 billion	<ul style="list-style-type: none"> <li>● Achieve the cumulative GHG avoided emission target of 49,000 tons under the JCM by the end of December 2023</li> </ul>
Fuyo General Lease Co., Ltd.	September 2023	—	JPY 30.0 billion	<ul style="list-style-type: none"> <li>● CO2 avoided emissions: 500,000 t-CO2/year in FY2026 Result: FY2019 85,000 t-CO2, FY2020 147,000 t-CO2, FY2021 153,000 t-CO2, FY2022 220,000 t-CO2</li> </ul>

# [Mizuho Securities] Sustainable Bonds with Avoided Emissions as Reporting Metric

- Mizuho Securities supports issuers' efforts to reduce GHG emissions through their businesses and appeals for their contributions by structuring sustainable finance using AE as a reporting metric.

## Nippon Steel Green Bond

Issue Date	March 2023
Issue Amount	JPY 50 billion
Coupon/Tenor	0.564%/5 years, 1.150%/10 years
External Reviewer	R&I (Rating and Investment Information, Inc.)

- Nippon Steel identified their efforts concerning climate change as the company's greatest priority issue and announced Nippon Steel's Carbon Neutral Vision 2050. Nippon Steel provided two values: "Reducing CO2 emissions in society (NSCarbolex® Solution)" and "Reducing CO2 emissions in the steelmaking processes (NSCarbolex® Neutral)."
- Nippon Steel issued their first green bond to be used funds for **production facilities of non-oriented electrical steel sheets for eco-friendly car motors**, which fall under the NSCarbolex® Solution.
- The company disclosed **the amount of avoided emissions calculated based on the CO2 reduction effect per eco-car** for environmental benefits.

### Impact Reporting (September 2023)

CO2 emissions reduction =  $\frac{\text{The number of eco-friendly cars produced}^{*1} \times \text{The effect of reducing CO2 emissions per eco-friendly car}}$

CO2 emissions reduction (theoretical value)	Approximately 3.0 million t-CO2/year
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## Kawasaki Heavy Industries Transition Bond

Issue Date	February 2024
Issue Amount	JPY 10 billion
Coupon/Tenor	0.742%/5 years
External Reviewer	JCR (Japan Credit Rating Agency, Ltd.)

- Kawasaki Heavy Industries has set sustainable finance targets <sup>\*2</sup> and established the world's first master framework for all types of sustainable finance <sup>\*3</sup> in November 2023 to promote sustainability management initiatives toward the realization of the Group Vision 2030.
- Kawasaki Heavy Industries issued a transition bond in February 2024 to finance **projects related to the transportation and storage of liquefied hydrogen carriers and liquefied hydrogen storage tanks, as well as for the use of energy such as hydrogen gas turbines for power generation**.
- The company disclosed **the amount of avoided emissions by the realization of a hydrogen society through the establishment of a clean hydrogen supply chain (hydrogen transportation, storage, and use)** for environmental benefits.

### Impact Reporting <sup>\*4</sup> (July 2024)

Reduction in CO2 emissions by using clean hydrogen (225,000 tons/year) transported through the establishment of a clean hydrogen supply chain

CO2 emissions reduction (theoretical value)	Approximately 1.6 million t-CO2/year
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\*1: Calculated from the estimated total shipment volume of non-oriented electrical steel sheets for eco-friendly car motors.

\*2: Ratio of sustainable finance to long-term interest-bearing debt (long-term debt and corporate bonds): 50% by 2030 and 100% by 2050.

\*3: Green, Transition, Transition Linked, Blue, Social, Sustainability Linked.

\*4: Reporting of the impact of projects related to "Clean Hydrogen Supply Chain Construction" common to the 58th Series (Sustainability Bond, July 2021), 59th Series (Green Bond, July 2022), and 60th Series (Transition Bond, February 2024).

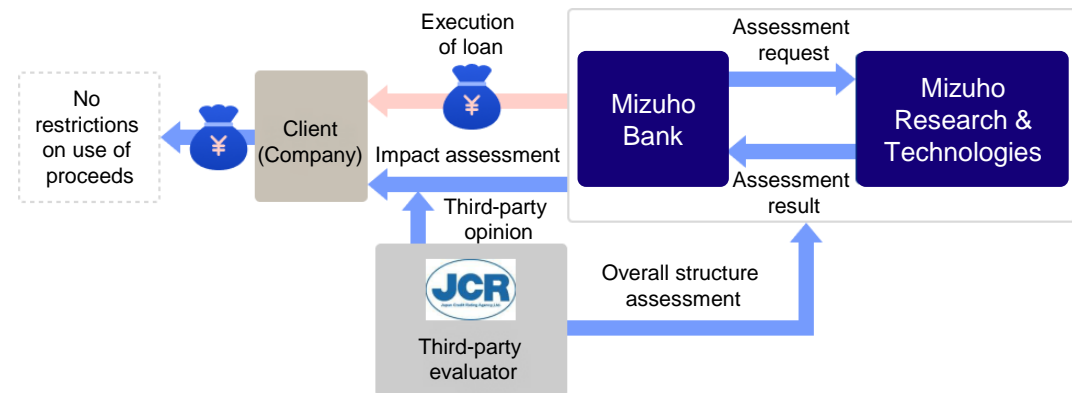
Sources: Nippon Steel Green Bond Framework, Nippon Steel Corporation: 7th and 8th Unsecured Corporate Bond (Green Bond) Reporting, Kawasaki Heavy Industries Master Framework, Press Release.

- **AE is used as the KPI of Mizuho Positive Impact Finance, a joint financing scheme by Mizuho Bank and Mizuho Research & Technologies.**

## Mizuho Positive Impact Finance which Sets Avoided Emissions as KPI

- Positive impact finance involves financial institutions conducting a comprehensive analysis and evaluation of "Environmental, social and economic impacts of corporate activities (positive and negative impacts)" based on the Principles for Positive Impact Finance established by the United Nations Environment Programme Finance Initiative (UNEP FI) and procedures consistent with the UNEP FI implementation guidelines, and financial institutions provide loans with the aim of continuing support for the activities.
- Financial institutions prepare a framework for impact analysis and evaluation, and monitor the impact after implementation.
- Mizuho Positive Impact Finance uses an evaluation framework developed independently by Mizuho Research & Technologies, which has extensive knowledge of sustainability, to identify the state of a company's sustainability management system and the impact that the company will bring, and to evaluate KPI and target setting. After implementation, KPI progress will be assessed annually and recommendations will be made to improve impact.
- Examples of Mizuho Positive Impact Finance, in which Mizuho Bank acts as an arranger and sets avoided emissions as a KPI, are shown below.
  - **Syndicated loan for Fuyo General Lease Co., Ltd.:**  
Executed in December 2022, the KPI is CO2 avoided emissions, and the target is CO2 avoided emissions of 500,000 t-CO2/year in FY2026.
  - **Syndicated loan for Tokyo Century Corporation:**  
Executed in March 2023, loan amount is JPY 108.6 billion, the KPI is estimated GHG avoided emissions (cumulative) under the Joint Crediting Mechanism (JCM), and the target is estimated GHG avoided emissions (cumulative) of 56,000 t-CO2 in FY2025.

### Mizuho Positive Impact Finance Scheme



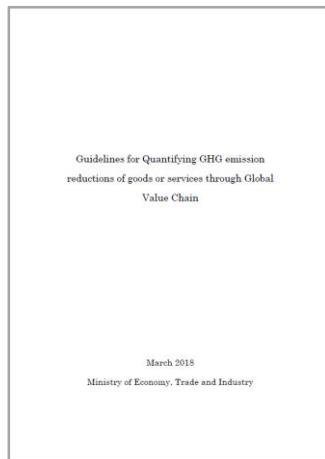
# [Mizuho Research & Technologies] Past Achievements in Avoided Emissions

- Mizuho RT has been involved in the development of various guidelines from the beginning of discussions on AE in Japan.
- Provides a variety of support services to clients, including calculation and review of AE, and preparation of guidelines.

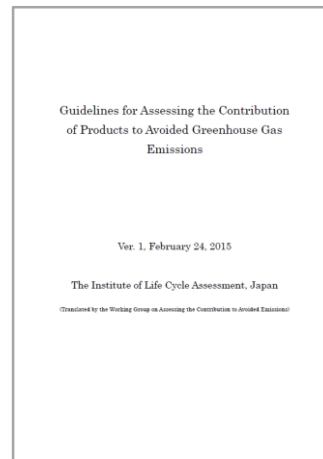
## Support for Formulation of Guidelines and In-house Rules on AE

- Mizuho RT has been involved in the initiatives for avoided emissions of the chemical and electrical/electronics industries that were discussed in Japan since the first half of the 2010s when avoided emissions were first discussed.
- Mizuho RT participated in discussions with experts and document development as a commissioned contractor and a member of the study group in the guidelines for avoided emissions established by the METI \*1 and the ILCAJ \*2.
- Based on these achievements, Mizuho RT also provides support services for formulating internal rules for calculating avoided emissions and create forms to confirm the validity of the calculation results within the company.

### METI Guideline (2018)



### ILCAJ Guideline (1st: 2015, 2nd: 2022)



## Support Services and Results Related to AE for Private Company

Support service	Service content	Recent result
<b>Calculation support</b>	<ul style="list-style-type: none"> <li>● Provide total support including the holding of study meetings on the outline of avoided emissions, setting of measurement conditions, and the calculation of avoided emissions.</li> </ul>	Chemicals, electrical and electronics, energy, metallic materials, petroleum refining
<b>Review of calculation result</b>	<ul style="list-style-type: none"> <li>● Review avoided emissions results independently calculated by companies from the viewpoint of consistency with various guidelines and validity of LCA evaluation.</li> <li>● Support for correct calculation by offering comments from the viewpoint of experts on areas that need improvement.</li> </ul>	Chemicals, electrical and electronics, trading companies
<b>Formulation of guideline for calculating avoided emissions</b>	<ul style="list-style-type: none"> <li>● Provide support for the preparation of guidelines that organize calculation methods and approaches within companies and industry sectors.</li> </ul>	Petroleum refining, construction
<b>Other</b>	<ul style="list-style-type: none"> <li>● Participate as an external expert on a review panel to provide advice on the appropriateness of the calculation method and approach for avoided emissions in Asahi Kasei's certification of Environment-Contributing Products.</li> </ul> <p><a href="https://www.asahi-kasei.com/sustainability/environment/eco_products/">https://www.asahi-kasei.com/sustainability/environment/eco_products/</a></p>	

\*1: METI: Ministry of Economy, Trade and Industry. \*2: ILCAJ: Institute of Life Cycle Assessment, Japan.  
Sources: METI (2018). *Guidelines for Quantifying GHG emission reductions of goods or services through Global Value Chain.*, ILCAJ (2015, 2022). *Guidelines for Assessing the Contribution of Products to Avoided Greenhouse Gas Emissions.*



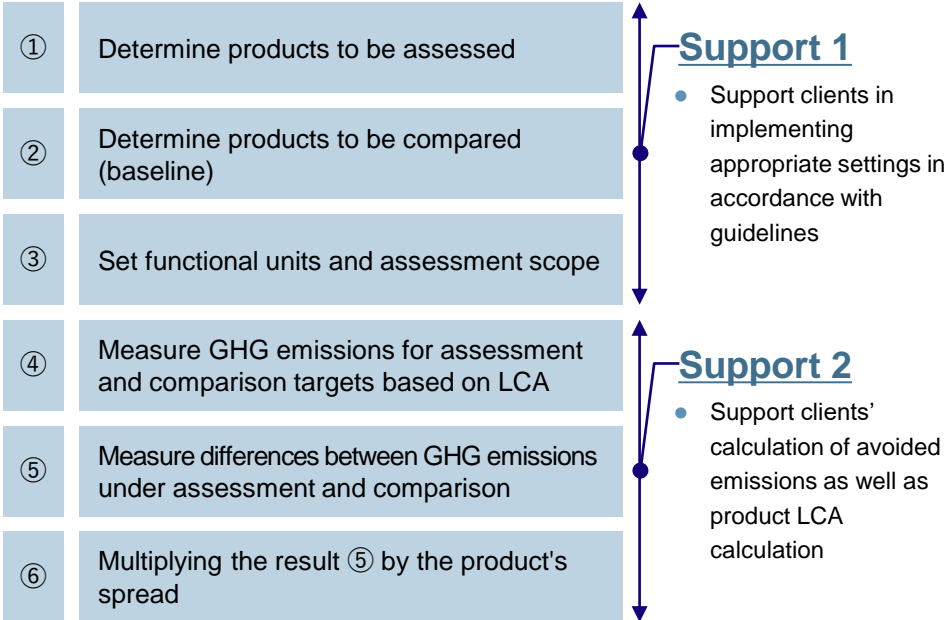
# [Mizuho Research & Technologies] Support Service for Calculation of Avoided Emissions

■ Based on its wealth of knowledge and experience, Mizuho Research & Technologies supports not only the calculation of AE but also the LCA calculation that is the basis for the calculation of AE.

## Support Service for Calculation of Avoided Emissions

### Support Service for Calculation of Avoided Emissions

- Mizuho Research & Technologies supports calculation of avoided emissions of products, materials, services, etc.  
\* Measurement is basically performed by the client.
- Mizuho Research & Technologies supports calculation of avoided emissions and disclosure of the result, referring to the guidelines by the WBCSD, the Institute of Life Cycle Assessment, Japan, and International Council of Chemical Associations, etc.



## LCA Calculation Related Services as Basis for Measuring AE

### Calculation Outsourcing Service

- Mizuho Research & Technologies performs LCA and Scope 3 calculations on behalf of the client.

### Calculation Advisory Service

- Mizuho Research & Technologies supports client's LCA calculation. (supports setting for calculation conditions, methods, and data collection as necessary.)  
\* Calculation is performed by the client.



# [Mizuho Financial Group] Measurement and Disclosure of AE in Mizuho’s Power Generation Sector Portfolio

- Since FY2020, Mizuho Bank has been disclosing financed emissions and CO2 AE through project finance in the power generation sector in accordance with PCAF Standard Part A.

## Measurement and Disclosure of CO2 Avoided Emissions in Power Generation Sector Portfolio (Project Finance)

- From 2024, Mizuho began disclosing its CO2 avoided emissions from the power generation sector portfolio, which had been disclosed on the Mizuho website, in the Mizuho Financial Group “Climate & Nature-related Report”.

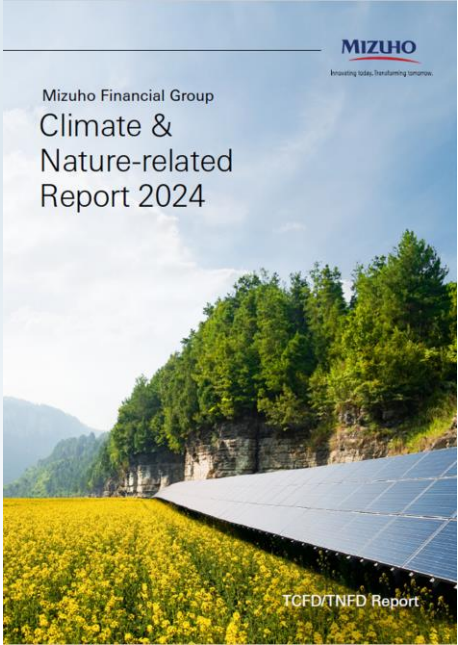
### Column: Measurements of CO2 avoided emissions of power sector portfolio (project finance)

Since FY2020, Mizuho Bank has disclosed financed emissions and CO2 avoided emissions for project finance in the power generation sector based on the PCAF concept.

CO2 avoided emissions are calculated based on the concept of Avoided Emissions in the PCAF guidance, by determining the CO2 emission reductions when power generation shifts from fossil fuels to renewable energy through the renewable power projects financed by Mizuho. This calculation is based on the emission factor of the fossil fuel that has the largest impact on the power generation mix in the project region.

	FY2019	FY2020	FY2021	FY2022
Financed Emissions (ktCO <sub>2</sub> )	8,901	8,627	8,765	10,308
<b>CO<sub>2</sub> Avoided Emissions (ktCO<sub>2</sub>)</b>	<b>4,349</b>	<b>4,688</b>	<b>4,871</b>	<b>6,390</b>

(See our webpage for the details: <https://www.mizuhogroup.com/sustainability/environment/activity/carbon>)



# [Mizuho Financial Group] Impact Business Compass

■ In May 2024, seven companies in the Mizuho group jointly published the “Impact Business Compass”.

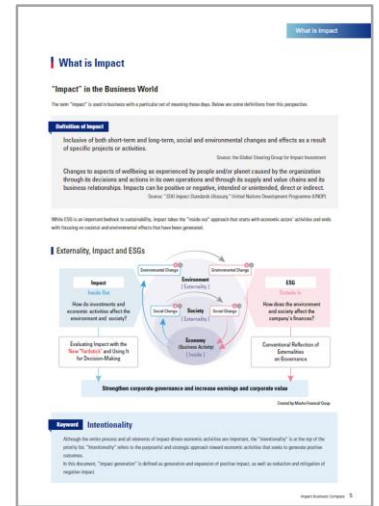
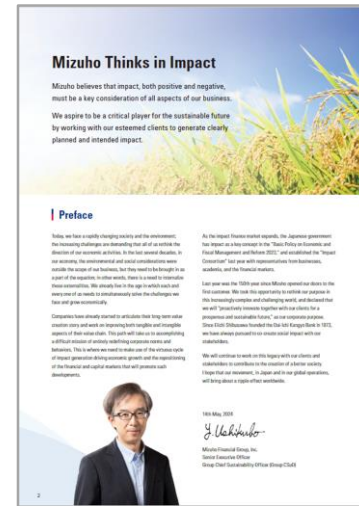
■ Mizuho uses AE as an impact metric to measure positive impact and assess opportunities.

## Mizuho “Impact Business Compass”

■ In order to help spread the concept of impact throughout the economy and society, Mizuho organized its thinking on impact and published the “Impact Business Compass”, which shows the possibilities and policies for Mizuho's impact businesses.

■ We aim to expand impact businesses and promote the growth of companies that create positive impacts through the specific utilization of positive impact metrics such as avoided emissions.

■ In the Compass, as an example of impact co-creation between clients and Mizuho, we introduce sustainability-linked bonds by Fuyo General Lease Co., Ltd., which set avoided emissions as sustainability performance targets (SPTs).





## **【Mizuho Financial Group】 Establishment of Sub-working Group on Avoided Emissions**

- In August 2024, Mizuho established a sub-working group on AE across the Mizuho group and began its activities.
- Mizuho will consider AE as one of the utilization metrics in its sustainability strategy.

### **Establishment of Sub-working Group on Avoided Emissions in Mizuho Impact Business Working Group**

- As noted in this report, as efforts to set net zero goals and develop transition plans are underway globally, sustainability stakeholders such as governments, standard-setting bodies, global initiatives, asset owners, financial institutions, and corporations are increasingly interested in avoided emissions.
- In response to these growing concerns, the development of measurement and disclosure rules for avoided emissions, and the use of such information in corporate disclosure and financing by financial institutions are expanding. In August 2024, Mizuho established a sub-working group on avoided emissions across the Mizuho group and began its activities.
- Mizuho Financial Group, Mizuho Bank, Mizuho Trust & Banking, Mizuho Securities, Mizuho Research & Technologies, and Mizuho-DL Financial Technology participated in the sub-working group on avoided emissions.
- In the future, this sub-working group will consider how to use avoided emissions as one of the metrics in Mizuho's sustainability strategy.

### **Sub-working Group on Avoided Emissions**





### **3. Future Potential of Avoided Emissions and Mizuho's Initiatives**

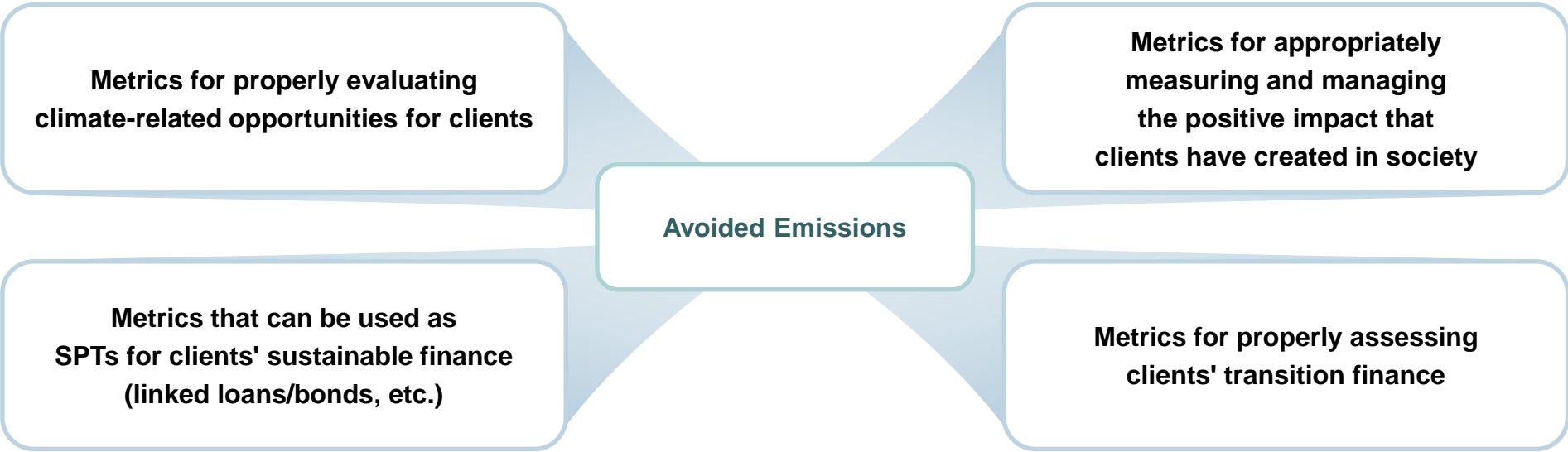
# Future Potential of Avoided Emissions and Mizuho's Initiatives

It is estimated that a huge amount of fund will be needed to achieve net zero globally. The International Energy Agency (IEA) says clean energy investment from all sources needs to reach USD 4.5 trillion per year by 2030 to limit temperature rise to 1.5°C. In Japan, we aim to achieve GX investment of more than JPY 150 trillion in the public and private sectors in 10 years from 2023.

Under such circumstances, Mizuho is expected to assist clients in their efforts to achieve net zero by providing sustainable finance and other services. As described in this report, Mizuho believes that avoided emissions are one of the most suitable metrics for evaluating clients' contribution to decarbonization and climate-related opportunities (enhancement of corporate value). By providing a variety of financial and non-financial solutions utilizing avoided emissions, Mizuho will accelerate the transition to create positive impact and achieve net zero.

Mizuho has been focusing on avoided emissions from an early stage, and has implemented unique initiatives related to avoided emissions, such as sustainable finance and consulting, and its own climate-related disclosure. Going forward, Mizuho will continue to leverage its experience and expertise in avoided emissions, as well as the Mizuho group's management resources, work in cooperation with various stakeholders to further disseminate and promote avoided emissions around the world, and expand financial and non-financial solutions that utilize avoided emissions.

## Utilization and Future Potential of Avoided Emissions in Sustainable Finance and Corporate Evaluation



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