GX 推進機構
Acceleration Agency

GX Future Report 2025

November 2025

GX Acceleration Agency

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Preface

On the Publication of the GX Future Report 2025

The global landscape surrounding GX is becoming increasingly complex. The recent shifts in U.S. policy or increased uncertainty in the business environment such as rising cost can give the impression that headwinds against GX are growing. Yet, when we look around the world, many countries are taking strategic steps to leverage their strengths and pursue decarbonization in tandem with strengthening industrial competitiveness.

This is precisely the concept that Japan has long advanced through its GX strategy. Now more than ever, it is essential that we remain steady and persistent in driving forward efforts that deliver both a carbon-neutral society and robust, sustainable economic growth.

Globally, we are entering an era where products and services that contribute to decarbonization can create substantial added value. For Japan, creating and expanding markets where GX-driven products and services—built on Japan's technological advantages—are recognized and chosen by consumers represents a significant opportunity for the Japanese economy, and will also become a leading model for the global economy.

In this context, getting a strategic understanding of global GX trends is fundamental to the work of GX Acceleration Agency. It is also crucial for Japanese companies seeking to navigate a fast-changing geopolitical and economic environment and identify new directions for business development.

This report has been prepared with the above-mentioned perspectives in mind. It is our hope that the report will serve as a useful reference, not only for those at the front line of business and financial institutions but also for a wide range of stakeholders, including executives, committed to Japan's GX, which eventually contributes to Global GX.

GX Acceleration Agency
COO, Executive Managing Director
Naoki Shigetake

01 GX Recent Trends

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GX Recent Trends: Report Preparation Policy

This section, "GX Recent Trends," has been prepared by comprehensively gathering and summarizing recent developments, trends, and progress in global GX initiatives to facilitate corporate decision-making and action planning.

Research scope

- The scope focused on the following fields and regions.

Field	Region	Objective
1. Policy and Industry	Organized by major countries and regions 1. Japan 2. EU, UK 3. US 4. Asia (China, Singapore and others)	To assist businesses in making medium- to long-term strategic decisions and capex planning across various countries and regions.
2. Finance	Worldwide sources, organized according to key themes 1. Sustainable Finance/Impact Investing 2. Information Disclosure	To enable companies to understand global trends and utilize them for responding to regulatory requirements and developing internal measures.

Information sources and target period

- Key information related to GX and climate change was gathered periodically, focusing primarily on various publications, including the following sources. In addition, major news websites were reviewed to ensure comprehensiveness.

<Main information sources>

1. Websites of Governments and public institutions
2. Websites of international organizations
3. Websites of private initiatives and frameworks
4. Websites of companies involved in GX-related projects

<Period of information gathering>

In principle, the target period covers April to September 2025 (however, for Japan, information of the past year is included).

GX Recent Trends: Global Overview from April to September 2025

» Amid rapidly changing geopolitical circumstances, each country is not only seeking concrete measures toward decarbonization but also emphasizing its industrial competitiveness and energy security. Similarly, each company is actively responding to these developments.

1. Policy & Industry	
1. Japan	**Announces Policies to Accelerate GX and Establishes a Long-Term Support Ecosystem** ● GX-related policies and transition finance guidance has been announced and updated to achieve decarbonization and enhance industrial competitiveness and economic growth. ● It has explicitly committed to mobilizing capital toward the energy transition and has proceeded with establishing a long-term support ecosystem.
2. EU **UK**	**Announces concrete initiatives aligned with policies underpinned by net-zero targets and reinforcing industrial competitiveness** ● EU: The Clean Industry Deal and Omnibus Package have been launched to **enhance competitiveness** and **reduce corporate burdens**, initiating proactive **support to industries**. ● UK: **Grants and subsidy schemes** for energy infrastructure, including hydrogen and offshore wind, have **entered the implementation phase**.
3. U.S.	**Strengthens support for the energy sector segments which benefits domestic competitiveness** ● The Trump administration, while seeking to shift away from the policies of the previous administration, **emphasizes the role of the energy industry in advancing industrial competitiveness and safeguarding national security** in alignment with U.S. strategic interests. ● In the private sector, **investments in business sustainability is maintained or increased** but companies are talking less about ESG (referred to as Greenhushing).
4. Asia (China, Singapore, others)	**Strengthen policies and business support to advance leadership in decarbonization and position the region as a hub for climate-related finance and investment** ● China: Government support through integrated financial and industrial policies has been strengthened, enabling the expansion of private business activities aimed at achieving dominance in the decarbonization industry. ● Singapore: As a hub for climate-related finance and investment, international collaboration on transition finance is being enhanced.
2. Finance	
1. Sustainable Finance/ Impact Investing	● Despite geopolitical volatility affecting ESG flows, **the market continues to grow**. In the Asia-Pacific region, several new initiatives are also being developed. ● Guidance on **climate adaptation and resilience** under the Principles for Responsible Banking (PRB), and a **framework to support prioritization of climate action investments** by the Global Impact Investing Network, Inc. (GIIN) have been released.
2. Information Disclosure	● With **the International Financial Reporting Standards (IFRS) Sustainability Standards (S1 and S2)** now globally recognized, the focus of discussion has shifted from "standard-setting" to "practical implementation." ● Guidance and revisions are underway **to facilitate corporate-level application**, and the scope of disclosure is broadening from climate change **to natural capital**.

1. (1) Policies and Industrial Trends in Japan (1/6)

Policies are implemented to achieve a comprehensive transition through incentives for GX investment.

- The Japanese government is supporting upfront investments of 20 trillion JPY through GX Economy Transition Bonds, aiming to mobilize over 150 trillion yen in public and private GX investments over the next decade by facilitating initial investments.
- Funding is secured through the implementation and gradual increase of growth-oriented carbon pricing, including GX-Surcharge on fossil fuel supply, and revenues from emission allowance auctions to power producers.
- In addition to initial investment support aligned with the "Sector-Specific Investment Strategies," measures to promote investments and establish regulations and systems for market creation are also being implemented.

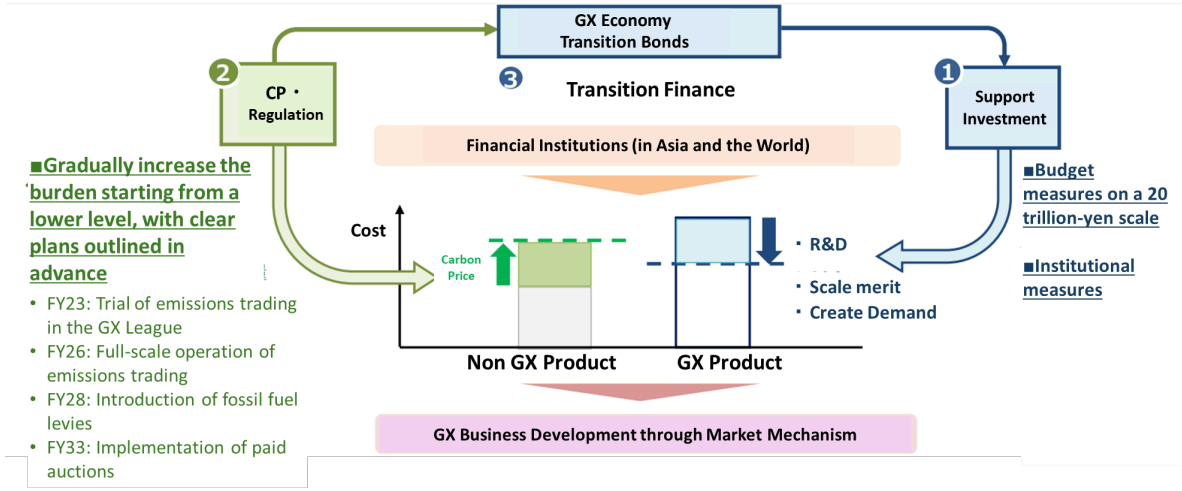
■ GX Policies in Japan

Year	Main Policies
2023	• Cabinet Decision on the Basic Policy for the Realization of GX (February) • Enactment of the GX Promotion Act (May) • Cabinet Decision on the GX Promotion Strategy (July) • Sector-Specific Investment Strategies (December)
2024	• Issuance of GX Economy Transition Bonds (February) • Launch of the GX Acceleration Agency and commencement of its operations by (July) • Revision of the Sector-Specific Investment Strategies* (December)
2025	• Cabinet Decision on the GX2040 Vision (February) • Enactment of the Amended GX Promotion Act and the Revised Act on the Promotion of Effective Utilization of Resources (May)
After 2026	• FY2026: Full-scale implementation of the emissions trading system • FY2028: Introduction of GX-surcharge • FY2033: Emission allowance auctions to power generation companies

***Revised Sector-Specific Investment Strategies**

- **prioritized fields**: Sixteen sectors have been identified as prioritized fields, including steel, chemicals, paper and pulp, cement, automobiles, batteries, aircraft, SAF (Sustainable Aviation Fuel), ships, life-related industry, resource circulation, semiconductors, hydrogen and its derivatives, next-generation renewable energy (e.g., perovskite solar cells, floating offshore wind power, and next-generation geothermal power), nuclear power, and CCS (Carbon Capture and Storage). Investment strategies have been developed for each of these prioritized fields.
- **Requirements for Businesses**: Businesses are required to (1) commit to transformative changes with speed, (2) attract capital from financial markets through their own efforts, and (3) make efforts to engage with consumers. Compliance with these requirements will be verified and monitored.
- **Other Stakeholders**: Market participants purchasing GX Economy Transition Bonds will be required, as far as possible, to disclose quantitative impacts such as progress on the relevant projects and their environmental benefits.

■ "Investment Promotion Package under the Growth-Oriented Carbon Pricing Initiative"



Source） Ministry of Economy, Trade and Industry, 2024, Sector-Specific Investment Strategies (Ver. 2)

1. (1) Policies and Industrial Trends in Japan (2/6)

GX is pursued with a long-term, integrated approach to energy and industrial transformation.

GX2040 Vision

- To enhance predictability toward GX investments, the "GX2040 Vision" was formulated in February 2025, with measures implemented with consideration for facilitating the workforce to newly emerging industries.

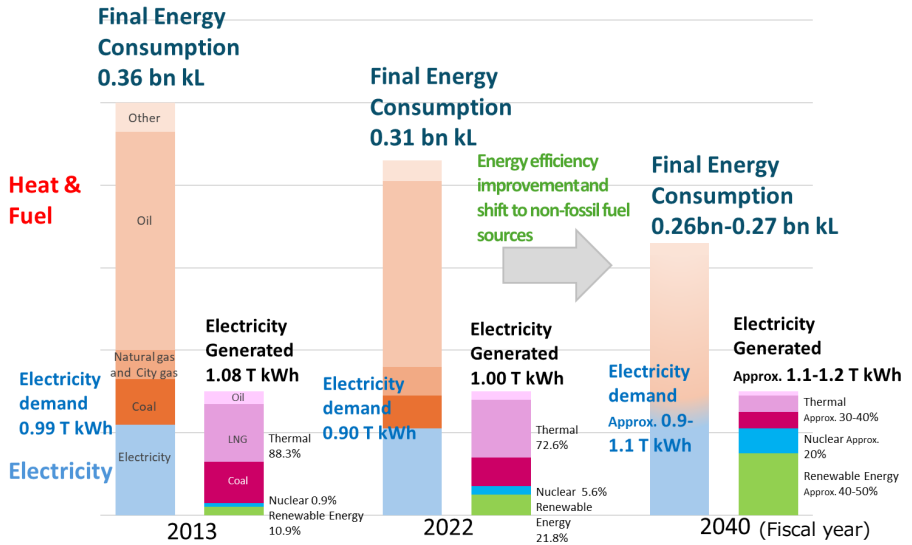
Policy	Summary
GX industrial structure	Improving corporate management and capital market systems, creating new industries through collaboration with overseas academic institutions, carving out from large corporations, creating an environment and supporting the active procurement of where GX-driven products and services, GX for small and medium-sized enterprises, and financial support to compensate for risks.
GX industrial location	Incentives to promote the development and utilization of decarbonized power sources for DCs dedicated to AI ,and effective collaboration between electricity and telecommunications entities (watt-bit collaboration).
Realistic approach to transition /contribution to decarbonization worldwide	Developing markets for Japan's high-value-added products, including GX-driven products, providing policy support for R&D and CapEx in technologies with high GHG reduction impact, and expanding the reach of transition finance.
Initiatives in individual fields	Accelerating GX initiatives in the respective energy, industry, and living sectors, based on the Sector-Specific Investment Strategies and the Strategic Energy Plan, including promoting measures in housing and agriculture sectors, and fostering awareness and behavioral change.
Growth-oriented carbon pricing	Full-scale implementation of emissions trading system (FY2026 onwards) and GX-Surcharge (FY2028 onwards).

Source) Created by authors based on the following: Ministry of Economy, Trade and Industry, GX 2040 Vision; Ministry of Economy, Trade and Industry, Energy Supply and Demand Outlook for FY2040 (related materials); Ministry of the Environment, Japan's NDC (Nationally Determined Contribution); and Ministry of the Environment, "Greenhouse Gas Emissions and Absorption for FY2023 (Detailed Figures)."

Key Points of The 7th Strategic Energy Plan and Plan for Global Warming Countermeasures

	2013	2022	2035	2040
GHG Emissions	-	-24%	-60%	-73%
Final Energy Consumption	-	-14%	-	-26%
Share of Power in Energy Consumption	26%	27%	-	35%
Share of non-thermal power sources	12%	27%	-	60-70%
Energy self-sufficiency rate	6.5%	12.6%	-	30-40%

Industrial transformation drives energy efficiency, supply of zero-emission power and electrification, reducing emissions and boosting self-sufficiency.



(Note) The graph on the left shows final energy consumption, while the graph on the right shows electricity generation. The electricity demand is calculated by subtracting transmission and distribution losses as well as in-house electricity consumption.

1. (1) Policies and Industrial Trends in Japan (3/6)

Policies and industrial trends (from October 2024 to September 2025) are as follows.

GX Policy

*Source: Japanese only.

Timing	Details
Dec. 2024	The revised version (ver.2) of the "Sector-Specific Investment Strategies" is announced under the GX Implementation Council. [Source]
Feb. 2025	The Cabinet approves the revised "GX2040 Vision: Strategy for Promoting the Transition to a Decarbonized, Growth-Oriented Economic Structure." [Source*]
	The Cabinet approves the "7th Strategic Energy Plan." [Source]
	The Cabinet approves the "Plan for Global Warming Countermeasures" and submits the updated Nationally Determined Contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat. [Source*]
May 2025	The amended GX Promotion Act is approved and enacted by the plenary session of the House of Councillors. [Source]
Jun. 2025	The Financial Services Agency (FSA) publishes the "Report of the Working Group on Financial Infrastructure for Carbon Credit Transactions." [Source*]
Jul. - Aug. 2025	The Ministry of Economy, Trade and Industry (METI) establishes the Subcommittee on the Emissions Trading System under the Industrial Structure Council's Innovation and Environment Committee. Under the Subcommittee, the Manufacturing Benchmark Working Group and the Power Generation Benchmark Working Group are established. [Source*]
Aug. 2025	The "GX Strategic Region Program" is established, and local governments and corporations are encouraged to submit proposals aimed at the GX Strategic Region objectives. [Source*]

Information Disclosure

Timing	Details
Mar. 2025	The Sustainability Standards Board of Japan (SSBJ) issues inaugural Sustainability Disclosure Standards. [Source]
Jun. 2025	FSA publishes a report on "Practices and Issues on Climate-related Risk Management." [Source]
Jul. 2025	The Financial System Council publishes an interim report based on the "Working Group on Disclosure and Assurance of Sustainability-related Financial Information." [Source]
Jul. 2025	The TCFD Consortium publishes "Towards Disclosure and Utilization of Corporate Scope 3 Emissions Data – Paving the way for Appropriate Investment Decisions." [Source]

1. (1) Policies and Industrial Trends in Japan (4/6)

Sustainable Finance

*Source: Japanese only.

Timing	Details
Dec. 2024	Publication of the “Japan Climate Transition Bonds Allocation Report for FY2023 Issuance.” [Source]
Mar. 2025	FSA, METI, and the Ministry of the Environment (MOE) revise the "Basic Guidelines on Climate Transition Finance.“ [Source]
	Publication of the “Potential Allocation Projects for Climate Transition Bonds (FY2025).” [Source]
Jun. 2025	The Cabinet Secretariat, FSA, Ministry of Finance, METI, and MOE revise the “Japan Climate Transition Bond Framework.“ [Source]
	FSA publishes the “Fifth Report by the Expert Panel on Sustainable Finance.” [Source*]
	FSA holds the 1st Impact Consortium results presentation and publishes the outcomes. [Source]
	MOE releases materials on the FY2025 Subsidy for Carbon Emission Reduction and Green Finance Promotion (Decarbonization Sector). [Source*]
	MOE publishes materials on the FY2025 Green Finance Promotion Project (Environmental Conservation Measures Sector). [Source*]
	METI opens applications for the FY2025 Transition Finance Promotion Subsidy. [Source*]
Jul. 2025	METI publishes the "Report on Scaling “Inclusive” Transition Finance in the ASEAN Region" (Interim Report by the Sub-Working Group on Transition Finance Promotion in Asia). [Source]
	MOE releases "Towards the Mid- to Long-Term Development of the Green Finance Market" under the "Green Finance Study Group.“ [Source*]
	MOE announces revisions to the "Green Bond and Green Loan Guidelines Annex 1 (Green List).“ [Source*]

1. (1) Policies and Industrial Trends in Japan (5/6)

Collaboration with overseas companies is advancing as policies are reviewed to adapt to changing business environments.

Industry Case ❶ Offshore wind power

- Offshore wind power is regarded as a key solution to make renewable energy a primary source. Currently, its installed capacity is 253.4 MW, accounting for less than 5% of the total wind power capacity (5,840.4 MW). However, measures are implemented to promote its adoption due to the potential for sea area utilization, addressing growing electricity demand, and generate economic effects.
- The goals of the “Vision for Offshore Wind Power Industry (2nd Edition)" are as follows:

Address Global Inflation and Create Attractive Domestic Market	Industrial and Technological Foundation
● The government aims to maintain an awarding target of 10 GW by 2030 and 30–45 GW, including floating offshore wind, by 2040. It seeks to form over 15 GW of floating offshore wind power projects by 2040 and develop large-scale floating offshore wind power projects by FY2029.	● The following goals are set for 2040: ● Achieve a domestic procurement rate of 65% over the entire lifecycle. (industry target) ● Train and secure approximately 40,000 offshore wind-related personnel. (industry target) ● Establish construction and O&M capabilities to support large-scale offshore wind projects. (government-industry collaboration

- The cancellation of offshore wind projects in three areas (totaling around 1,700 MW) under the "1st round" of bidding was announced in August 2025. It was later concluded that steady project awarding is essential for building a sustainable foundation for offshore wind and reducing costs. Necessary issues, including policy measures for selected operators, will be identified and applied to revise the system.

Source） Japan Wind Power Association, 2024, [Preliminary Report] Wind Power Installation Capacity in Japan (as of the end of December 2024), Public-Private Council for Strengthening Competitiveness in the Offshore Wind Industry, 2025, Vision for Offshore Wind Power Industry (2nd Edition), Agency for Natural Resources and Energy, Ministry of Land, Infrastructure, Transport and Tourism, 2025, Policy Position and Future Perspectives on Offshore Wind (Materials from the 37th Joint Meeting of the Working Group on Offshore Wind Promotion under the Subcommittee on Large-Scale Deployment of Renewable Energy and Next-Generation Power Networks of the Advisory Committee for Natural Resources and Energy, and the Subcommittee on Offshore Wind Promotion under the Environmental Subcommittee of the Ports and Harbors Subcommittee of the Council for Transportation Policy).

- In October 2025, the Japanese government implemented the following measures to advance offshore wind project development:
  - Identification of two "Promising Zones" and three "Preparation Zones" toward their designation as "Promotion Zones" under the Act on Promoting the Utilization of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities.
  - Selection of three areas for site surveys under the "centralized approach," involving government and local authorities from the initial stages of project development.
- Additionally, based on the public-private partnership framework established by METI, collaborations between domestic companies and overseas OEMs are also progressing.

Company	Cases
GE Vernova Eurus Energy	Leading wind power equipment manufacturer GE Vernova and Eurus Energy Holdings signed a memorandum of understanding (MOU) to jointly promote the integration of renewable energy deployment and data center development in northern Hokkaido. (June)
GE Vernova Mitsubishi Electric	GE Vernova and Mitsubishi Electric signed a memorandum of understanding (MOU) to strengthen cooperation in the semiconductor sector for enhancing power transmission and distribution solutions. (June)
Siemens Gamesa TDK	Siemens Gamesa, a leading offshore wind company, and TDK signed a memorandum of understanding (MOU) to strengthen cooperation on the supply of magnets for wind turbines. (June)
Vestas Nippon Steel	Leading wind turbine manufacturer Vestas and Nippon Steel signed a memorandum of understanding (MOU) to promote collaboration on the supply of steel for wind turbine towers. (July)

Source） METI, https://www.meti.go.jp/press/2025/10/20251003001/20251003001.html * （Accessed on 14 October 2025）
*Source: Japanese only.

1. (1) Policies and Industrial Trends in Japan (6/6)

Companies are beginning to respond to government initiatives for the transition of hard-to-abate industries and hydrogen, both essential for achieving GX.

Industry Case ❷ Electric arc furnace steel production

- CO2 emissions from steel production account for 7–9% of global emissions. Steel production using electric arc furnaces is estimated to reduce emissions by approximately 40–70% compared to production based on blast furnaces, making it one of the key measures for reducing greenhouse gas emissions in the steel industry.
- While transitioning from blast furnace processes to electric arc furnaces offers significant CO2 reduction potential, traditional electric arc furnaces are limited in the types of steel they can produce. Starting in FY2024, the Japanese government has launched a support program to promote a transition to innovative electric arc furnaces capable of producing steel with similar properties to that from blast furnaces, but with lower CO2 emissions during production. Nippon Steel and JFE Steel Corporation decide to invest in innovative electric arc furnaces, respectively.

	Nippon Steel	JFE Steel
Summary	1 New (Kitakyushu), 1 Capacity increase (Himeji), 1 Retrofit/Reoperate (Shunan)	Innovative electric arc furnace (Kurashiki)
Scale	Total: approx. 2.9 million tons/year	Approx. 2.0 million tons/year
Investment	Total 868.7 billion JPY	Total 329.4 billion JPY
Government Support	Up to 251.4 billion JPY (FY2025 "Support for energy/manufacturing process conversion for hard-to-abate industries").	Up to 104.5 billion JPY (FY2024 "Support for energy/manufacturing process conversion for hard-to-abate industries").
Start of Production	FY2028 H2–FY2029 H2	Q1 in 2028

Source） Worldsteel, https://worldsteel.org/about-steel/facts/steelfacts/#climate-action; Nippon Steel Press Release, https://www.nipponsteel.com/en/newsroom/news/2025/__icsFiles/afieldfile/2025/09/26/20250530_200.pdf ; JFE Steel Press Release, https://www.jfe-steel.co.jp/en/release/2025/04/250410.html; Support Projects in Hard-to-Abate industries, https://hta-process.jp/; * Support Projects in Hard-to-Abate industries 2025, https://2025.hta-hojo.jp/ *(Accessed on 14 October 2025)

Industry Case ❸ Support focusing on the price gap for low-carbon hydrogen and its derivatives

- Hydrogen contributes to strengthening industrial competitiveness and achieving decarbonization, with a target to increase adoption to 20 million tons by 2050, roughly 10 times current level. Due to its high cost, various support measures are being implemented.
- The "Hydrogen Society Promotion Act" was enacted in October 2024, to accelerate the supply and use of low-carbon hydrogen and its derivatives by providing subsidies focused on closing the price gap with existing fuels and supporting the development of infrastructure.
- In September 2025, the Agency for Natural Resources and Energy (ANRE) approved the following two projects:

Company	Projects
Toyota Tsusho Eurus Energy Iwatani Aichi Steel	✓ By utilizing renewable wind power, a manufacturing SPC—established by Toyota Tsusho, Iwatani Corporation, and Eurus Energy HD—will produce green hydrogen through water electrolysis and supply it to Aichi Steel as fuel for heating furnaces for special steel production. ✓ The electrolysis facility, scheduled to operate from 2030 to 2055, will have a capacity of 15 MW and supply about 1,600 metric tons of hydrogen annually.
Resonac Nippon Shokubai	✓ At Resonac's Plant, hydrogen generated through gasification-based chemical recycling of waste plastics will be utilized as a feedstock for producing ammonia, which serves as a raw material for fiber production. ✓ The annual ammonia production capacity is 20,815 tons (equivalent to 3,234 tons of hydrogen), with the project running from 2030 to 2055.

Source） Agency for Natural Resources and Energy, https://www.enecho.meti.go.jp/category/saving_and_new/advanced_systems/hydrogen_society/carbon_neutral/ *(Accessed on 10 October 2025）

*Source: Japanese only.

1. (2) Policies and Industrial Trends in EU and UK (1/3)

» **The EU** has **launched proactive industrial support** through the "Clean Industry Deal" and "Omnibus Package" to **boost competitiveness and reduce corporate burdens**. **The UK** has moved to the **implementation phase of grants and subsidy schemes** for hydrogen and offshore wind energy infrastructure.

Policy

- **The EU has embraced its role as a global leader in climate change policies**, including the adoption of the "European Climate Law" in 2021, aiming for the "2050 Net Zero" target.
- However, not only the renewable energy transition but also the Ukraine crisis have **driven up energy prices**, and groups less committed to climate action have gained influence in the European Parliament and across member states.
- To address these challenges, the Draghi Report in September 2024 urged the EU to introduce **measures aimed at strengthening industrial competitiveness**. This led to the launch of the Competitiveness Compass in January 2025 and the Clean Industry Deal in February 2025. Also in February 2025, the Omnibus Package was announced, which **seeks to ease corporate burdens** by reducing sustainability reporting requirements and delaying their implementation.

- ✓ May 2025: The European Commission (EC) urges member states to draft plans to phase out imports of Russian gas, oil, and nuclear fuel.
- ✓ June 2025: The EU adopts New State Aid Framework (CISAF) to push forward the development of clean energy in energy-intensive industries. See p.16
- ✓ June 2025: As part of the Omnibus Package, the Carbon Border Adjustment Mechanism (CBAM) is amended following an agreement, introducing an exemption for mostly SMEs and individual importers who account for about 90% of all importers.
- ✓ July 2025: The EC proposes a legally binding climate target to cut net greenhouse gas emissions by 90% by 2040 compared to 1990.

- The UK's climate policies have remained largely unchanged since leaving the EU, with GHG emissions about half of 1990, continuing its decarbonization trend.

- ✓ June 2025: The UK government, as part of its Spending Review, announces new funding for hydrogen transport and storage infrastructure, CCS/CCUS, nuclear power, and offshore wind. See p.17
- ✓ August 2025: The Transition Finance Council (TFC), co-launched by the City of London and the UK government, issues a draft of Transition Finance Guidelines to assess financing for high-emission sector companies that are aligned or aligning with credible pathways. The TFC is consulting on the draft and aim to publish the final form Guidelines in 2026.

Industry

- Building on the EU's "Clean Industry Deal" and the UK government's decarbonization policies, **targeted bidding and support measures are being introduced to accelerate GX-driven investment.**

- ✓ May 2025: The EC announces 1 billion EUR in public funding for 15 renewable hydrogen production projects across the European Economic Area (EEA).
- ✓ August 2025: The EC approves France's offshore wind support measures under CISAF. See p.16
- ✓ September 2025: The European Investment Bank (EIB) announces plans to allocate 17.5 billon EUR between 2025 and 2027 to improve energy efficiency for SMEs.

- ✓ July 2025: The UK government approves the first group of commercial-scale green hydrogen projects , with construction now underway. See p.17
- ✓ September 2025: Great British Energy, publicly-owned energy company, publishes Statement of Strategic Priorities to accelerate clean energy development and reduce investment risks.

1. (2) Policies and Industrial Trends in EU and UK (2/3)

EC adopts adopts New State Aid Framework “CISAF” to support clean industry

- In June 2025, the EC **adopted the new "Clean Industrial Deal State Aid Framework (CISAF)" to support clean industry**. This policy is part of the Clean Industry Deal, aims to support energy-intensive industries and turn to decarbonization. **It aims to assist member states in supporting clean energy, industrial decarbonization, and the development of clean technologies, and will remain in effect until the end of 2030.**as follows:

  - ✓ **Accelerate rollout of clean energy** : Simplify and accelerate the approval procedures of investment for clean energy projects.
  - ✓ **Provide Support for electricity costs for energy-intensive users** : Enhance competitiveness by supporting cost for electric power cost.
  - ✓ **Facilitate industrial decarbonization** : Improve energy efficiency and enhance international competitiveness through support technology related to electrification, hydrogen, and CCUS.
  - ✓ **Ensure sufficient manufacturing capacity in clean technologies** : Support for projects certified under the Net-Zero Industry Act (NZIA) for clean technology manufacturing, including those involving critical raw materials.
  - ✓ **De-risk private investments** : Support provided through Member States for the mitigation of investment risks in clean energy and decarbonization.

- **To mitigate risks associated with private investments in decarbonization**, aid measures may be implemented, including renewable energy investment support by Member States and electricity price relief for energy-intensive users.

EC approves France’s offshore wind support (11 billion EUR)

- In August 2025, the EC **approved France's offshore wind energy support scheme**, which is the first large-scale renewable energy approved under CISAF . The scheme amounts to **11 billion EUR(approx. 1.9 trillion JPY)** and will run for 20 years.
- The measure will support **the construction and operation of three floating offshore wind power farms**: one in Southern Brittany and two others in the Mediterranean Sea. Each windfarm is expected to have a capacity of approximately 500 MW, and to generate around 2.2 TWh, equivalent to the annual consumption of 450,000 French households. Under French AO9 (offshore wind power tender), the following projects are scheduled, for which twelve candidate developers have already been selected.

■ Planned Projects

Project	1	2	3
Region/ Offshore area	Offshore Southern Brittany	Mediterranean Sea (Off the Coast of Occitanie Region)	Mediterranean Sea (Off the Coast of Provence-Alpes-Côte d'Azur Region)
By Foundation Type: Fixed-Bottom or Floating	Floating Type	Floating Type	Floating Type
Operating Period	2032-2034	2032-2034	2032-2034
Installed Capacity	400-550MW	450-550MW	450-550MW

Source） European Commission, https://competition-policy.ec.europa.eu/about/contribution-clean-just-and-competitive-transition/clean-industrial-deal-state-aid-framework-cisaf_en; European Commission Communication C/2025/3602, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:C_202503602; European Commission, Overview of support possibilities under the Clean Industrial Deal State aid Framework, https://competition-policy.ec.europa.eu/document/download/93776e25-7c9c-4e19-aa9e-76ca80cbf5e4_en?filename=CISAF%20-%20Overview%20aid%20intensities%20_amounts%20.pdf; European Commission, https://ec.europa.eu/commission/presscorner/detail/en/ip_25_1939; French Energy Regulatory Commission, https://www.cre.fr/fileadmin/Documents/Rapports_et_etudes/2024/241024_2024-194_prequalification_AO9_rapport.pdf (Accessed on 29 September 2025)

1. (2) Policies and Industrial Trends in EU and UK (3/3)

UK Government announces support for Hydrogen, CCS/CCUS, Nuclear Power, Offshore Wind Power

- In June 2025, the UK government, as part of its Spending Review, announces funding for hydrogen transport and storage infrastructure, CCS/CCUS, nuclear power, and offshore wind. It also advances support measures and development approvals for individual projects.

Hydrogen transportation and storage infrastructure

- As part of the Spending Review, landmark funding of over 500 million GBP was confirmed to develop the UK's first regional hydrogen transportation and storage infrastructure. This hydrogen network will, **for the first time, connect producers on the supply side with power plants and other end users on the demand side**.
- **Thousands of jobs are projected to be created in old industrial regions—the Midlands and Northern England**—as part of the UK's Plan for Change.
- Future support for hydrogen electrolysis projects is expected through the "Hydrogen Allocation Rounds (HAR)" program.

Hydrogen Allocation Rounds (HAR): Under the UK hydrogen production support scheme, hydrogen production facilities such as electrolysis are selected, and the produced hydrogen is purchased at a strike price.

- ✓ HAR1: In 2023, 11 projects totaling 125 MW were selected, including Marubeni Europower's HyBont project in Wales (5.2 MW). 2 billion GBP was committed to hydrogen purchases at an average price of 241 GBP/MWh, together with partial funding for construction costs. Construction commenced on 10 of these projects in July 2025.
- ✓ HAR2: 27 projects have been shortlisted, with final selections expected in early 2026.
- ✓ HAR3: Planned to launch in 2026.
- ✓ HAR4: Planned to launch in 2028.

CCS/CCUS

- As part of the Spending Review, a 9.4 billion GBP commitment was announced to support UK carbon capture industries.
- In June 2025, the UK government **announces funding support for two CCS projects**: the Acorn Project in northern Scotland and the Viking Project in central England. Funding of 200 million GBP will be approved for the Acorn Project — the first time such large-scale support has been provided.

Nuclear Power

- **The final investment decision (FID) of several billion GBP was approved for the Sizewell C nuclear power plant**, representing the UK's first large-scale nuclear FID in nearly nine years following Hinkley Point C.

Offshore Wind Power

- As part of the Spending Review, a 300 million GBP commitment is announced to strengthen the offshore wind supply chain.
- The UK government approves **the development of two offshore wind projects**: the Mona Offshore Wind Farm (1,500 MW) and the Morgan Offshore Wind Farm (1,500 MW), both of which will be among the largest in the Irish Sea.

Source) UK Government, https://www.gov.uk/government/news/funding-secured-for-britains-industrial-future; https://www.gov.uk/government/news/500m-boost-for-hydrogen-to-create-thousands-of-british-jobs; https://www.gov.uk/government/publications/hydrogen-production-business-model-net-zero-hydrogen-fund-shortlisted-projects/hydrogen-production-business-model-net-zero-hydrogen-fund-har1-successful-projects#list-of-successful-har1-projects; https://www.gov.uk/government/publications/hydrogen-allocation-round-2-har2-projects/hydrogen-allocation-round-2-har2-shortlisted-projects; https://www.gov.uk/government/collections/hydrogen-allocation-rounds; https://www.gov.uk/government/news/jobs-unlocked-as-first-wave-of-hydrogen-projects-sign-contracts; https://www.gov.uk/government/news/sizewell-c-gets-green-light-with-final-investment-decision; https://www.gov.uk/government/news/energy-secretary-approves-largest-irish-sea-offshore-wind-farm; https://www.gov.uk/government/news/morgan-offshore-wind-project-generation-assets-development-consent-decision-announced (Accessed on 10 October 2025)

1. (3) Policies and Industrial Trends in U.S. (1/3)

» The Trump administration **prioritized the energy industry from the viewpoint of industrial competitiveness and national security** to drive domestic interests, shifting policies from the previous administration. In the private sector, **investments in business sustainability is maintained or increased** but companies are talking less about ESG (referred to as Greenhushing).

Policy

- The Trump administration continues to **reinforce support for technologies and projects** that utilize domestic energy assets to bolster industrial competitiveness and national security, **with a particular surge in support for nuclear energy**. Conversely, it is scaling back subsidies for solar and wind power, characterizing them as “unreliable and foreign-controlled.“

✓ April 2025: President Trump orders Zero-Based Regulatory Budgeting for all energy regulations to unleash American energy.
✓ May 2025: Executive orders are signed to revitalize the nuclear industry from the perspective of expanding baseload power. See p.19
✓ July 2025: Under the enactment of the One Big Beautiful Bill Act (OBBBA), tax credits for “unreliable” solar and wind power are terminated.
✓ August 2025: The Department of Energy (DOE) announces the selection of a Tennessee-based firm as the first U.S. company under the pilot program for advanced nuclear fuel lines. See p.19
✓ August 2025: DOE officially kicked off "President Trump's Reactor Pilot Program," announcing initial selections for the new reactor pilot program. See p.19

- The Trump administration **is significantly rolling back and downsizing previous climate policies**, declaring its exit from the Paris Agreement on Day One and withdrawing from international negotiations. Nevertheless, **climate initiatives persist on a state-by-state basis** in Democratic-leaning states.

✓ May 2025: California proposes extending its Cap-and-Invest program through 2045 in its May Revision to the 2025–26 state budget.
✓ July 2025: DOE publishes a report stating that while climate change is real and deserves attention, global energy poverty is the greatest threat facing humanity.
✓ July 2025: The Environmental Protection Agency (EPA) proposes to rescind the classification of greenhouse gases as pollutants subject to regulation under the Clean Air Act, the “Endangerment Finding” itself.
✓ September 2025: DOE announces its intention to return more than 13 billion USD in unobligated funds initially appropriated to advance the Green New Deal initiatives from the previous Biden administration. Additionally, it unveils a 625 million USD investment to reinvigorate and expand the coal industry.

Industry

- Renewable energy projects —specifically wind power— were temporarily halted under the Trump administration, and **some of them are showing signs of resumption**.

✓ May 2025: The U.S. government allows construction activities to resume for the offshore wind project “Empire Wind,” which was halted. See p.20
✓ September 2025 : The US District Court for the District of Columbia grants a preliminary injunction allowing the Rhode Island offshore wind project to restart impacted activities, following a stop-work order previously issued by the Trump administration. Construction is expected to resume.

- In the private sector, companies **maintain or increase their investments in business sustainability** in response to the retreat in climate change policies, even as they engage in no public talk about ESG and promote their efforts less, a trend referred to as “greenhushing.”

✓ April 2025: The application for “Green Impact Exchange (GIX),”a stock exchange focused on sustainability, is officially approved.
✓ September 2025: EcoVadis reports that U.S. companies maintain or increase their investments in business sustainability. Separately, 52% of executives are moving away from the term “ESG.” See p.20

1. (3) Policies and Industrial Trends in U.S. (2/3)

Trump administration announces a pro-nuclear stance, supporting advanced reactors and nuclear fuel supply chains

- Under the Biden administration, the Inflation Reduction Act (IRA) provides tax credits for existing facilities and investment incentives for new ones. However, the Trump administration is pivoting away from the previous administration's renewable energy policies while **demonstrating a pro-nuclear stance**, setting a goal to **quadruple nuclear power capacity** to 400 GW.

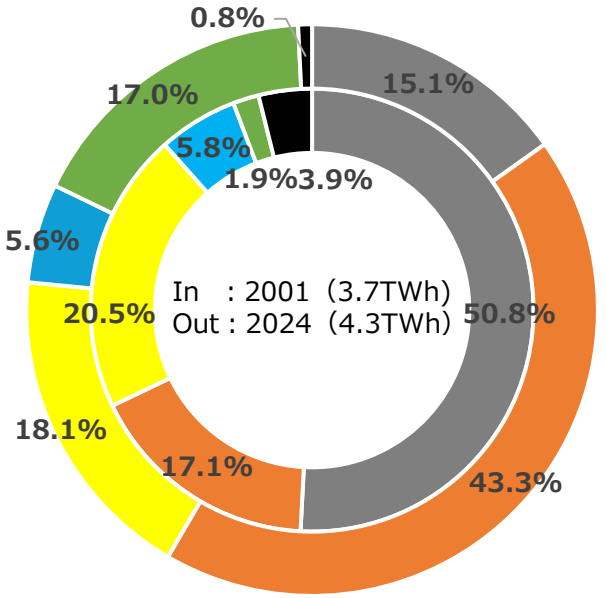
■ U.S. Nuclear Energy Policy Initiatives

May	✓ **To develop and commercialize advanced reactor technology**, the President issues Executive Orders on "Deploying Advanced Reactor Technology for National Security" and "Reforming Reactor Testing."
June	✓ **A New "Pilot Program"** (New Pathway to Test Advanced Reactors) is announced **to expedite the testing of advanced nuclear reactor designs**.
Aug.	✓ DOE announces the selection of Standard Nuclear, located in Tennessee, as the first U.S. company for its **advanced nuclear fuel supply chain pilot program**.
	✓ DOE kicks off the "Reactor Pilot Program" **and initially selects 11 advanced reactor projects** to work with, ensuring at least three reactors are built and achieve criticality.
	✓ DOE Office of Nuclear Energy announces **the establishment of the "DPA Consortium" to seek voluntary agreements with industry for ensuring the nuclear fuel supply chain**, pursuant to the Defense Production Act and in accordance with the Executive Order on "Revitalizing the Nuclear Industrial Base."
Sep.	✓ DOE announces 134 million USD in funding for two programs designed **to secure U.S. leadership in emerging fusion technologies and innovation**.

＜Background＞

- In 2024, **the US remains the world's largest nuclear generator** with 94 reactors in operation and a total generation capacity of approximately 97 gigawatts (GW) ,followed by France (57 reactors, 63.0 GW), China (57 reactors, 55.3 GW), and Russia (36 reactors, 28.6 GW).
- In the U.S. electricity generation mix, **nuclear power accounts for approximately 20%, second only to natural gas-fired generation, which exceeds 50%.** However, new nuclear construction has long been stagnant, **with total capacity remaining largely unchanged since 1990**. Of the 94 reactors currently in operation, only three have entered service since 1996: two in Georgia (2023–2024) and one in Tennessee (2016).

■ Power generation by source in the U.S.



Coal, Gas, Nuclear Power, Hydropower, Other Renewable Energy, Others (Oil and others)

Source） DOE, https://www.energy.gov/ne/articles/9-key-takeaways-president-trumps-executive-orders-nuclear-energy; https://www.energy.gov/articles/energy-department-announces-first-pilot-project-advanced-nuclear-fuel-lines; https://www.energy.gov/ne/articles/energy-department-establish-new-consortium-nuclear-fuel-supply-chain; https://www.energy.gov/articles/department-energy-announces-initial-selections-new-reactor-pilot-program; https://www.energy.gov/articles/energy-department-announces-134-million-advance-us-fusion-leadership-through-targeted; U.S. Energy Information Administration (EIA), Electricity Data Browser, U.S. Energy Information Administration (EIA), https://www.eia.gov/todayinenergy/detail.php?id=65104; https://www.eia.gov/electricity/data/browser/#/topic/0?agg=2,0,1&fuel=vvg&geo=g&sec=g&linechart=ELEC.GEN.ALL-US-99.A~ELEC.GEN.COW-US-99.A~ELEC.GEN.NG-US-99.A~ELEC.GEN.NUC-US-99.A~ELEC.GEN.HYC-US-99.A&columnchart=ELEC.GEN.ALL-US-99.A~ELEC.GEN.COW-US-99.A~ELEC.GEN.NG-US-99.A~ELEC.GEN.NUC-US-99.A~ELEC.GEN.HYC-US-99.A&map=ELEC.GEN.ALL-US-99.A&freq=A&ctype=linechart&ltype=pin&rtype=s&pin=&rse=0&maptype=0 (Accessed on 6 October 2025)

1. (3) Policies and Industrial Trends in U.S. (3/3)

Lifting the Halt to Resume Offshore Wind Construction

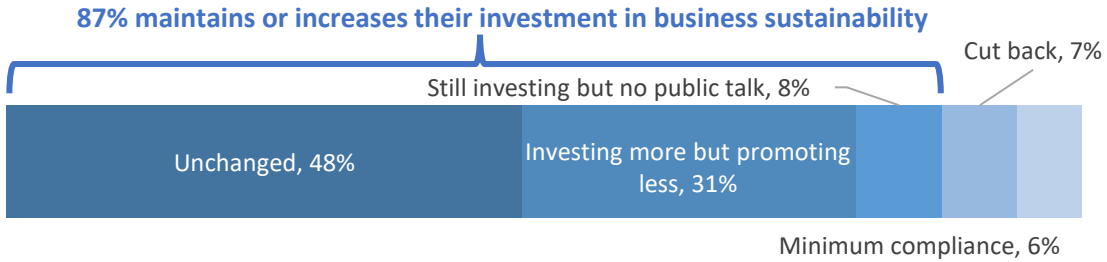
- In May 2025, the Interior's Bureau of Ocean Energy Management (BOEM) notifies Equinor, the Norwegian energy giant, of the authorization **to lift the halt on construction for the "Empire Wind."** The project, involving 147 turbines, is expected to provide clean electricity to over 700,000 households annually.
- Initiated in 2011 at the request of the New York Power Authority, the project receives approval for its Construction and Operations Plan in February 2024 following a competitive bidding process. Construction work commences shortly thereafter and reaches a 30% completion rate (see the table below for details).
- In April 2025, a halt order for the project's construction activities is issued under the Trump administration's policy review. However, **following engagement from New York State authorities, the order is amended to lift the halt, allowing work to resume**.

Capacity	Total 2.1GW　　Empire Wind 1：816MW、Empire Wind 2：1,260MW
Location	Located 20-30 km miles off the coast of New York
Operation	In 2027 (commercial operation date): Construction progress is at 30%
Developer	Empire Offshore Wind LLC (originally formed as a joint venture of Equinor ASA (Norway) and BP (UK))
Timeline	✓ Sep. 2011: Request for lease plans submitted to BOEM by the NY Power Authority and others. ✓ Dec. 2016: BOEM holds a lease sale: an auction. ✓ Mar. 2017: BOEM approves a lease for offshore wind power to Statoil Wind (the predecessor of Equinor). ✓ Feb. 2024: BOEM approves the construction plan. ✓ Jun. 2024: Equinor solidifies offtake contract for Empire Wind 1 with the NY State Energy Research and Development Authority.

Most U.S. companies maintain their sustainability investments, but with little public communication

- In July 2025, EcoVadis, a company providing business sustainability ratings and related support services, published the report "2025 U.S. Business Sustainability Landscape Outlook."
- The report shows that **the majority of U.S. companies surveyed are maintaining or increasing their investment in business sustainability**. It is concluded that even as a wave of "greenhushing" — driven by current political backlash — is reshaping how they act and what they say publicly about their own sustainability, U.S. companies are doubling down on sustainability because it's about competitiveness and resilience.

■ Changes in Sustainability Investment in 2025



- A survey of sustainability executives (published by The Conference Board in May 2025) also noted "greenhushing." Among the 125 major multinational companies surveyed (80% of which are based in the U.S.), 80% **report adjusting their ESG strategies in response to the new administration**. The most common change is the reframing of communications, with 52% of executives reworking their sustainability messaging, including moving away from the term "ESG."

Source） BOEM, https://www.boem.gov/renewable-energy/state-activities/empire-wind; Equinor ASA, https://www.equinor.com/news/20250519-empire-wind-project-resumes-construction; Reuter, "US approves Equinor and BP's Empire Wind offshore project, country's sixth", https://www.reuters.com/business/energy/us-approves-equinor-bps-empire-wind-offshore-project-countrys-sixth-2023-11-22/#:~:text=Nov%2021%20%28Reuters%29%20,under%20President%20Joe%20Biden%27s%20administration; Empire Wind, https://www.empirewind.com/2024/06/04/empire_wind_offtake_contract_ny/; EcoVadis, 2025, The 2025 US Business Sustainability Landscape Outlook, The Conference Board, https://www.conference-board.org/press/sustainability-under-scrutiny-2025 (Accessed on 6 October 2025)

1. (4) Policies and Industrial Trends in Asia (1/2)

» **China** is **expanding its business in decarbonization-related sectors** with the aim of establishing industrial dominance but is also bolstering state support **through the integration of financial and industrial policies**. **Singapore** is strengthening international collaboration in **transition finance to solidify its position as a hub for climate-related finance and investment**.

Policy

- China **is seeking to capture a broader industrial base** by expanding its business from traditional green sectors such as renewable energy into adjacent areas, including clean transport and the circular economy, with the aim of establishing global industrial dominance. To accelerate this, China **is developing an enabling financial environment and strengthening the integration of financial and industrial policies**.

✓ April 2025: The Ministry of Finance of China issues sovereign green bonds aligned with the International Capital Market Association (ICMA) principles, which are listed on the London Stock Exchange. See p.22
✓ July 2025: The People's Bank of China (PBC) publishes “the 2025 Green Finance-Supported Projects Catalogue" by integrating the existing green taxonomy.
✓ August 2025: China releases the "Guiding Opinions on Financial Support for New-Type Industrialization."
✓ August 2025: China issues guideline to advance low-carbon transition, strengthen national carbon trading market.

- Leveraging its strategic location in Asia, a region with high emissions, Singapore is **focusing more on transition finance** to establish itself as a hub for climate-related finance and investment. To this end, the country **is ensuring a transparent market environment and strengthening international collaboration**.

✓ July 2025: The Singapore Sustainable Finance Association (SSFA) publishes practical guidance for the "Singapore-Asia Taxonomy." See p.22
✓ July 2025: The Monetary Authority of Singapore (MAS) strengthens collaboration with China and the UK on transition finance. See p.22

Industry

- In China, driven by policy support, GX-related manufacturing industries are being actively expanded domestically and internationally. Leveraging its abundant critical mineral resources and overwhelming production capacity, China **is positioning itself to become the “Global Factory for GX.”**

✓ April 2025: A state-owned energy enterprise breaks ground on large-scale, 5GW solar power plants in a coal mining zone.
✓ May 2025: The National Energy Administration of China announces the country's 2024 hydrogen energy production and consumption scales, ranking first globally.

- Due to constraints such as limited land area and a lack of natural resources, the services sector accounts for over 70% of Singapore's GDP. With a particular focus on the financial sector and the promotion of a 'Leading Centre for Green Finance,' concrete investment and financing projects are being structured in line with national policies.

✓ September 2025: Singapore's MAS announces that the Green Investments Partnership (GIP) under the "Financing Asia’s Transition Partnership (FAST-P)" initiative has achieved its first close with 510 million USD in capital raised.

1. (4) Policies and Industrial Trends in Asia (2/2)

China issues its first Sovereign Green Bonds

- In April 2025, **the Chinese Ministry of Finance issues its first sovereign green bonds on the London Stock Exchange**. The issuance consists of two tranches in CNY: a 3-year tranche at a 1.88% interest rate and a 5-year tranche at 1.93%. The total issuance was 6 billion CNY (approximately 120 billion JPY), with investor applications reaching 41.58 billion CNY, 6.9 times the issuance amount.
- The bonds are issued under the "**Sovereign Green Bond Framework**" published in February 2025, which aligns with ICMA principles and has obtained two second-party opinions.

■ The primary use of proceeds under Sovereign Green Bond Framework

Field	Use of Funds
Clean Transport	• Manufacturing, purchase, and research of clean energy vehicles such as EVs, fuel cell vehicles, and PHEVs, including infrastructure
Sustainable Water/ Water Discharge Management	• Improvement of rural living environment (e.g., sewage treatment and the remediation and treatment of black and malodorous water bodies) • Water resources protection and restoration (e.g., groundwater management, soil erosion control, and river restoration/governance) • Flood and drought disaster prevention (e.g., river management and rain and water monitoring)
Sustainable Management of Natural Resources/ Land Use	• Conservation or restoration of natural landscapes (e.g., mountains, rivers, and forests; sustainable forestry) • Grassland ecological protection facilities
Marine Ecosystem Protection and Restoration	• Protection of fragile ecosystems or ecosystems with excellent quality (e.g., coastal zones, mangrove) • Restoration and management (same as above)
Pollution Prevention and Control	• Support for air pollution prevention and control; and collaboration in combating climate change
Resource Utilization and Recycling	• Waste treatment, recycling and resource utilization projects (e.g., the treatment of waste electrical and electronic products)

Singapore issues “Practical Guidance” for Taxonomy and Enhances International Collaboration

- On July 9, 2025, SSFA publishes “Guidance for Leveraging the Singapore-Asia Taxonomy in Green and Transition Financing” as practical guidance.
  - ✓ MAS previously unveiled the "Singapore-Asia Taxonomy for Sustainable Finance (SAT)" at COP28 in December 2023.
  - ✓ With support from MAS, SSFA developed and issued the "Guidance for Leveraging the Singapore-Asia Taxonomy in Green and Transition Financing," intended as practical guidance for implementing SAT.
  - ✓ **Focusing primarily on the transition aspect**, this guidance aims to address practical challenges faced by financiers and borrowers—including companies and other entities—when applying the SAT to green and transition financing instruments.
- On July 11, MAS announces enhanced international collaboration with China, followed by a similar announcement regarding the UK on July 14.
  - ✓ MAS and PBC announces to “**Deepen Cooperation on Green and Transition Finance."**
  - ✓ MAS and the UK’s Financial Conduct Authority (FCA) announce strengthened collaboration to accelerate **clean energy transition and sustainable infrastructure investment in Southeast Asia**. Additionally, the UK pledges a contribution of up to 70 million GBP for the **“FAST-P”** initiative, **led by Singapore**.

Source） Government of China Website, https://english.www.gov.cn/news/202504/03/content_WS67ee784cc6d0868f4e8f16bf.html; Climate Bonds Website, https://www.climatebonds.net/2025/04/china-debuts-landmark-sovereign-green-bond-global-stage; Responsible Investor, https://www.responsible-investor.com/esg-round-up-china-plans-to-issue-debut-sovereign-green-bond-in-london/; Seneca ESG, https://senecaesg.com/insights/china-launches-825-million-green-bond-on-london-stock-exchange-to-advance-esg-carbon-neutral-strategy/; The People’s Republic of China Sovereign Green Bond Framework, https://www.mof.gov.cn/zhengwuxinxi/caizhengxinwen/202502/P020250220628637927734.pdf; SSFA, https://www.ssfa.org.sg/ssfa-resources/ssfa-sat-practical-guidance-july2025/; https://www.ssfa.org.sg/wp-content/uploads/2025/07/SSFA-Taxo-WS-Guidance-for-Leveraging-the-SAT-in-Green-and-Transition-Financing-FULL-Jul-2025.pdf; MAS, https://www.mas.gov.sg/news/media-releases/2025/uk-and-singapore-mark-the-10th-uk-singapore-financial-dialogue; https://www.mas.gov.sg/news/media-releases/2025/mas-and-pboc-deepen-cooperation-in-green-and-transition-finance-at-the-3rd-singapore-china-gftf (Accessed on 29 September 2025); https://www.mas.gov.sg/news/media-releases/2025/singapore-uk-collaborate-on-energy-transition-sustainable-infrastructure-investments-in-sea (Accessed on 30 October 2025)

2. (1) Sustainable Finance and Impact Investment (1/2)

» While geopolitical shifts drive fluctuations in ESG capital flows, **the overall global market size continues to expand**. Countries are **making progress in developing investment regulations and increasing project pipelines**. Meanwhile, new guidance on adaptation and resilience from the PRB and the framework from the GIIN for prioritizing climate change mitigation investments are published.

International Market

- Geopolitical shifts drive regional outflows and increased volatility in ESG capital flows; however, **the global market remains resilient.**

✓ July 2025: Global sustainable investment funds record estimated net inflow of 4.9 billion USD in Q2 2025, rebounding from net outflows of 11.8 billion USD in Q1 marked by geopolitical changes and ESG backlash. Regionally, the European market leads the recovery with 8.6 billion USD in net flows, while the U.S. records 5.7 billion USD in outflows (Source: Morningstar).
✓ July 2025: Cumulative issuance of GSS+ bonds aligned with Climate Bonds Dataset Methodologies surpasses 6 trillion USD, with China's first-ever sovereign green bond issuance contributing significantly.

- Countries are making progress **in developing investment regulations and increasing project pipelines**, driven by the simultaneous advancement of regulatory frameworks and public-sector bond issuances.

✓ May 2025: India releases the framework for ESG bonds (other than green debt securities) and invites expert/public comments on the Draft framework of climate finance taxonomy.
✓ June 2025: Australia releases the sustainability finance taxonomy for climate change mitigation (green and transition).
✓ June 2025: The Hong Kong SAR Government issues green bonds and infrastructure bonds totaling approximately 27 billion HKD.
✓ September 2025: Denmark announces the issuance of a 10-year government bond fully aligned with the "European Green Bond (EuGB) Standard"—the world's first legally binding uniform standard for EU green bonds—with issuance planned by the end of 2025.

- These initiatives drive **the development of frameworks** that enhance the ESG and impact investing landscape, facilitating increased investment.

✓ June 2025: GIIN releases the "Climate Solutions Investing Framework" to provide asset owners with practical guidance on prioritizing investment strategies for meaningful contribution to global climate goals. See p.24
✓ July 2025: The United Nations Environment Programme Finance Initiative (UNEP FI) releases the "Practical Guidance on Implementing Adaptation and Resilience for Banks" under the PRB.
✓ July 2025: The Principles for Responsible Investment (PRI) publishes the "Sustainability Value Creation Framework." See p.24

2. (1) Sustainable finance and impact investment (2/2)

GIIN releases Climate Solutions Investing Framework

- In June, GIIN releases the "**Climate Solutions Investing Framework**" a new framework designed to assist asset owners in prioritizing investment strategies for climate change mitigation.
- The framework provides practical guidance by not only channeling capital flow towards these solutions but also offering a clear set of criteria for rapid and strategic investing strategies that prioritize effective emission reductions to contribute meaningfully to global climate goals. It specifically **focuses on mitigation (GHG reduction and removal) as its primary climate solution**.
- The Framework includes:
  - ✓ **Foundational concepts**：Explanation of how climate solutions differ from other climate strategies and what is important to consider when assessing climate solutions investing strategies.
    Examples: "Transitioning to a Low-Carbon Economy Requires Investing in Solutions of Varying Maturity and Building Supporting Ecosystems." "Managing Uncertainty Is Important." "Multiple Tools Are Needed to Evaluate Climate Solutions."
  - ✓ **Criteria for evaluation**：Guidance for assessing internal or external managers' approaches to climate solutions investing. They identify four criteria, applicable across all asset classes, which can serve as a basis for differentiating asset managers' strategies.
    1. Identifying a Strategy's Climate Thesis
    2. Assessing the Approach to Quantifying Contribution to Economy-Wide
    3. Understanding the Approach to Prioritization
    4. Understanding the Methodologies Used to Manage Uncertainties

PRB releases Guidance on Implementing Adaptation and Resilience for Banks

- In July, UNEP FI publishes the "**Practical Guidance on Implementing Adaptation and Resilience for Banks" developed by the PRB.**
- Building on the previously issued the "Climate Adaptation Target Setting Guidance" (November 2023), this guidance is designed for a broad range of banks, whether they are "beginning their adaptation and resilience journey" or "looking to enhance established practices."
- The guidance is structured around three following areas : **(1) Assessment, (2) Strategy, and (3) Action,** along with the fourth chapter, "Continuous Improvement." It is broadly applicable to banking portfolios and in particular, it focuses on the Real Estate and Agriculture/Food sectors—generally recognized as having significant exposure to climate-related impacts and offering viable financing—to provide concrete illustrations and detailed scenarios.

Structure of Guidance	Objective
① **Assessment**	**Qualifying and quantifying** "physical climate risk materiality" and "the Adaptation and Resilience (A&R) opportunity"
② **Strategy**	**Defining the bank strategy** to "manage physical climate risk" and to "pursue the A&R opportunity"
③ **Action**	**Implementing the A&R strategy** through client engagement, policies, processes, and effective governance.
④ **Continuous Improvement**	Ensuring the bank's A&R approach remains effective, responsive, and continuously evolves by learning from experience and new insights

Source）GIIN, https://thegiin.org/publication/research/the-giin-climate-solutions-investing-framework/; GIIN Press Release, https://giin-web-assets.s3.amazonaws.com/giin/assets/press-release/final-giin-climateframework-pressrelease-2025-(1).pdf; UNEP FI, Practical Guidance on Implementing Adaptation and Resilience for Banks, https://www.unepfi.org/industries/banking/new-principles-for-responsible-banking-report-to-support-banks-addressing-climate-adaptation-and-resilience/; https://www.unepfi.org/industries/banking/adaptation-resilience-guidance (Accessed on 6 October)

2. (2) Framework for Information Disclosure

With IFRS S1 and S2 established as the global standard for sustainability disclosure, the focus has shifted from “standard-setting” to “practical implementation.” This shift is driving **ongoing refinements in standards and regulations to facilitate corporate-level application**. In addition to climate change , **addressing natural capital** is increasingly becoming a key focus of disclosure frameworks.

Framework for Information Disclosure

- Since the IFRS Foundation's announcement of the Sustainability Disclosure Standards (IFRS S1/S2) in June 2023, they **have been recognized as a global standard**, with the CDP questionnaire aligning more closely with IFRS S1/S2. Currently, **Preparations are underway to facilitate corporate-level application,** including refinements in the standards and the publication of guidance on transition plan disclosures.

✓ April 2025: The International Sustainability Standards Board (ISSB) publishes an exposure draft proposing targeted amendments to IFRS S2 to ease application by companies.
✓ June 2025: IFRS Foundation releases guidance on transition plan disclosures to entities to provide high-quality information about their climate-related transition.
✓ June 2025: Global Reporting Initiative (GRI) launches the "Sustainability Taxonomy," aligned with ISSB and European ESRS, for digital sustainability reporting.
✓ July 2025: ISSB publishes proposed amendments to SASB standards to assist entities in their application.
✓ July 2025: IFRS Foundation publishes near-final examples on reporting uncertainties in the financial statements using climate-related example.
✓ July 2025: CDP releases a report offering insights from CDP’s IFRS S2-aligned disclosures.

- The IFRS Foundation identifies natural capital (BEES: Biodiversity, Ecosystems, and Ecosystem Services) as a key research theme in its 2024–2026 work plan and formalizes collaboration with the Taskforce on Nature-related Financial Disclosures (TNFD). **Discussions on natural capital (BEES) are expected to gain full momentum moving forward**.

✓ April 2025: IFRS and TNFD formalise collaboration to provide capital markets with high-quality nature-related information.
✓ September 2025: The ISSB met in September to discuss 'Common investor information needs and comparison to ISSB materials' regarding BEES, taking the first step in October to develop BEES.

02

GX Featured Theme

Investigation into Demand Trends and Consumer Willingness to Pay for GX-driven Products

Contents: Investigation into Demand Trends and Consumer Willingness to Pay for GX-driven Products

Significance, Background, and Approach of this Research Project

To understand acceptance of price pass-through for environmental premium, the study combines demand-side consumer survey with supply-side cost analysis. It also draws insights for Japan from international price pass-through case studies.

Significance and Background

- To promote the widespread adoption of GX-driven products, it is essential to establish market mechanisms that enable the appropriate pass-through of environmental premiums at each stage—raw materials, intermediate goods, and final goods.
- However, due to a lack of clarity regarding consumers' willingness to pay, supply-side incentives for investment and technological development remain limited.
- Thus, this project aims to empirically assess consumer acceptance levels and supply-side costs and examine the feasibility of a GX product market in Japan, along with potential directions for policy support.

Approach of this Research Project

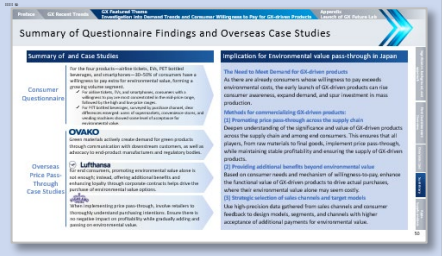
：Scope of Disclosure

Demand-side survey (Consumer survey)
Assess willingness to pay for environmental value, the amount, and the reasons for payment.

Supply-side analysis
Estimate the cost increase when replacing key raw materials and fuels with green alternatives.

Integration of demand survey result and supply side analysis result
Determine consumer retention and defection rates when environmental compliance costs are incorporated into the selling price.

Implications for Japan's efforts
Based on the current state of consumer acceptance and lessons learned from international case studies on price pass-through, devise strategic directions for domestic initiatives Japan should pursue.



Overseas price pass-through case study
Examine case studies of a specialty steel manufacturer, an airline, and a PET bottled beverage company that implemented price pass-through for environmental value, and extract strategies they deployed as well as insights applicable to Japan.

OVAKO Lufthansa HIGHLAND SPRING

Overview of the First Questionnaire on Environmental Value

A consumer survey was conducted to understand acceptance when green premium is incorporated into the selling price.

Products

- Taking into account purchase price, frequency, and other factors, four product categories were selected: airline tickets, electric vehicles (EVs), PET bottled beverages, and smartphones.

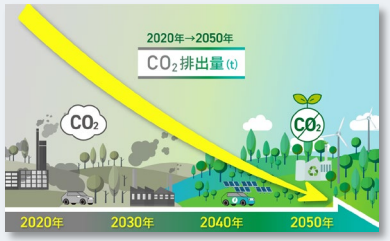
Objective

- To understand the extent to which consumers are willing to pay extra for "green products"—products that reduce CO2 emissions during the production and sales processes—compared to existing products ("gray products").
  - The term "green products" here refers to items produced with environmentally friendly practices: low-CO2 steel or aluminum for EVs and smartphones, recycled PET for bottled beverages, and airline tickets incorporating 10% SAF (Sustainable Aviation Fuel). To appeal to consumers, these concepts will be conveyed using visual imagery as outlined in point ④ below.
- Quantitatively assess consumers' willingness to pay, the relationship between consumer attributes and the price range of the products.

Flow

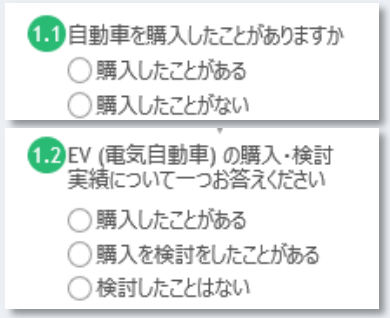
1 Provide background info on environmental value

To ensure respondents easily understand the purpose of the survey, include a brief introduction at the beginning addressing the Japanese government's carbon-neutral goals and the objectives of this survey, supplemented with visual aids.



2 Ask about past purchase/ consideration history

Ask respondents about their purchase history, and for those without purchase experience, ask about whether they have considered purchasing it.

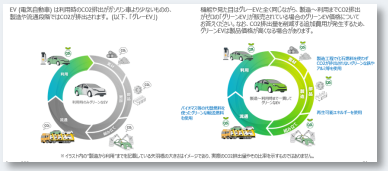


3 Ask about purchase/ consideration price

Ask respondents about the price range for products they have purchased or are considering purchasing. Present specific manufacturers and models alongside this question.

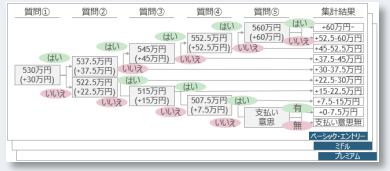
4 Explanation of gray vs. green products

Visually outline the definition of green and gray products, emphasizing that gray products emit CO2 along the value chain, while green products does not have such emissions.



5 Ask about willingness to pay for green products

Using the Contingent Valuation Method (CVM), ask about the amount consumers are willing to pay. For those willing to pay, also ask about the reasons behind their willingness.



2 ～ 5 are implemented for each of the four products individually.

Overview of the First Questionnaire on Environmental Value

In this survey, responses were collected from over 1,000 consumers, while eliminating the impact of attribute bias.

No. of Responses		1,010 persons
Period		16th-18th May 2025
Respondent Attributes[1]	Age	15-19 5%, 20's 11%, 30's 13%, 40's 17%, 50's 15%, 60's 14%, 70 and above 26% — 1,010
	Gender	Male 48%, Female 52% — 1,010
	Educational background	Junior high school graduate 11%, High school graduate 27%, Vocational school graduate 12%, Bachelor's degree 42%, Master's degree or higher 8% — 1,010
	Family Composition	Single 34%, Married with children 54%, Married without children 13% — 1,010
	Work Style[2]	Dual-income household 42%, Single-income household 34%, Others 23% — 550
	Household Income	Below ¥4M 27%, ¥4M-6M 15%, ¥6M-8M 11%, ¥8M -10M 12%, ¥10M -15M 10%, ¥15M or more 9%, Others 15% — 1,010

1. Values after weight-back aggregation based on demographics (gender and age).
2. Attributes related to work style are restricted to married individuals living with their household, resulting in a total of 550 responses.

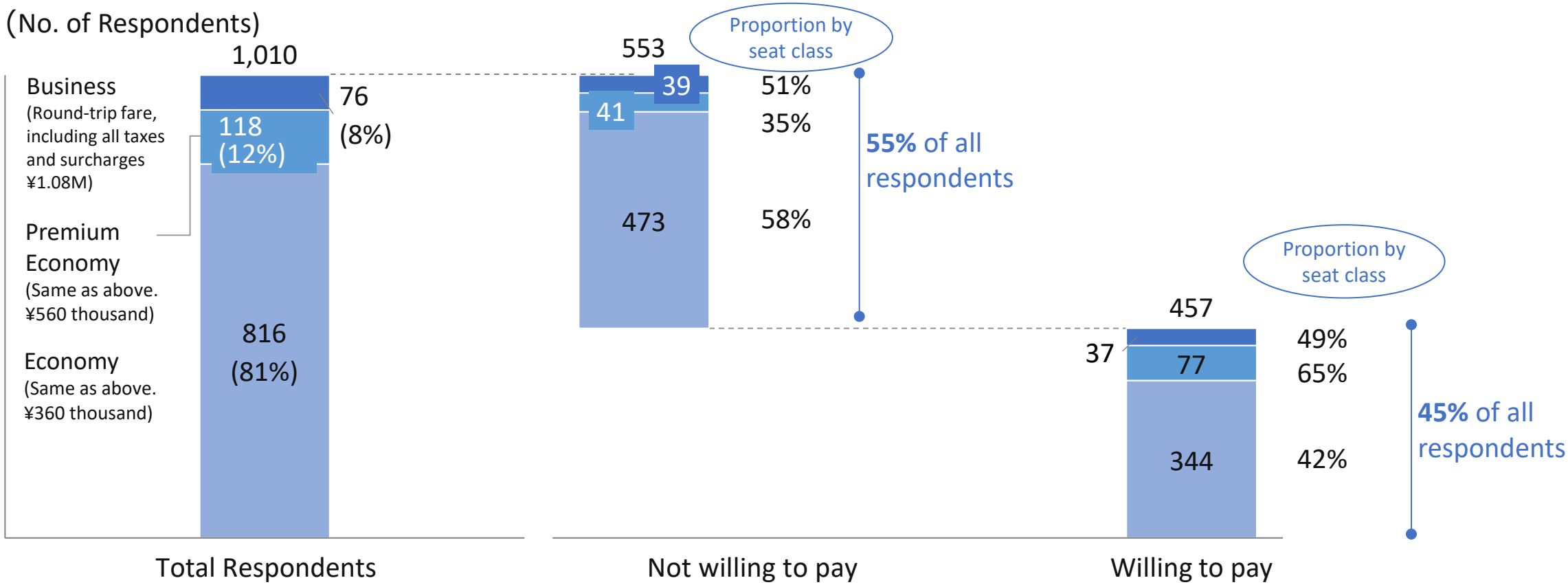
(1) Overview of the Questionnaire and the Result

In a questionnaire survey of over 1,000 consumers focusing on airline tickets, EVs, PET bottled beverages, and smartphones, 30–50% of respondents expressed a willingness to pay for environmental value, provided that the product performance remains unchanged.

- By product category, 45% of consumers for airline tickets, 32% for EVs, 46% for PET bottled beverages, and 51% for smartphones expressed willingness to pay a premium for environmental value added to the price of gray products. The primary reasons cited include contributing to society, supporting future generations, and providing fair compensation to companies for their environmental efforts. Additionally, some consumers mentioned external influences such as social perception and media influence.
- Variations in willingness to pay across products may be influenced by factors such as the scale of the additional price presented in the survey (the actual amount and rate of increase) and the product's visibility in terms of CO2 emissions during purchase or use. For instance, in the case of smartphones (where smaller amounts of materials are used and the associated environmental-value price increases are relatively limited) and PET bottled beverages (with a lower base price and smaller increases), willingness to pay is higher. On the other hand, for EVs, which require large amounts of materials such as steel and therefore show higher presented price increases both in absolute and percentage terms, a greater proportion of consumers appear unwilling to pay.
- For airline tickets, EVs, and smartphones, willingness to pay for environmental value was most common among consumers in the middle-price range, followed by those in the high- and low-price ranges. Among high-price range respondents, 50–70% indicated a lack of willingness to pay, while a notable segment accepted the maximum proposed premium, revealing a polarization of attitudes. Meanwhile, for PET bottled beverages, surveyed across different purchase channels, clear differences were observed. Consumers using supermarkets, convenience stores, and vending machines showed some level of acceptance for environmental value, while those purchasing from bulk retailers or e-commerce platforms were more price-sensitive and demonstrated lower willingness to pay additional costs.

(2) Results by products: Airline Tickets (1/3)

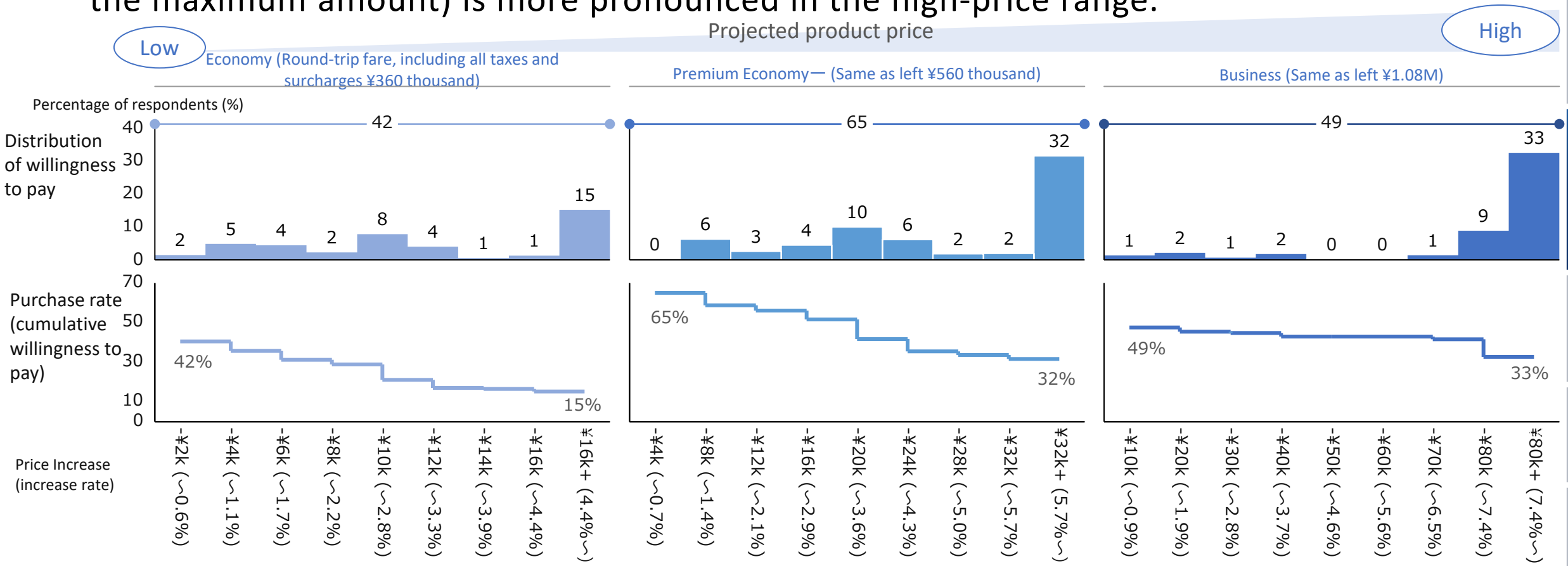
» For airline tickets, 81% of respondents chose economy class, and 45% of the overall respondents expressed willingness to pay for added environmental value.



Note) Due to weight-back aggregation based on demographics (gender and age) and rounding of decimal values, the addition, subtraction, multiplication, or division of figures on the slide may not match exactly.

(2) Results by products: Airline Tickets (2/3)

» Consumers willing to pay up to the maximum amount for environmental value exist across all price ranges; however, polarization in willingness to pay (unwilling vs. willing to pay for the maximum amount) is more pronounced in the high-price range.



Note) Due to weight-back aggregation based on demographics (gender and age) and rounding of decimal values, the addition, subtraction, multiplication, or division of figures on the slide may not match exactly.

(2) Results by products: Airline Tickets (3/3)

The primary reasons for paying for the environmental value of airline tickets include contributing to society, supporting future generations, and fairly compensating companies for their environmental efforts.

Product Price: Low → High

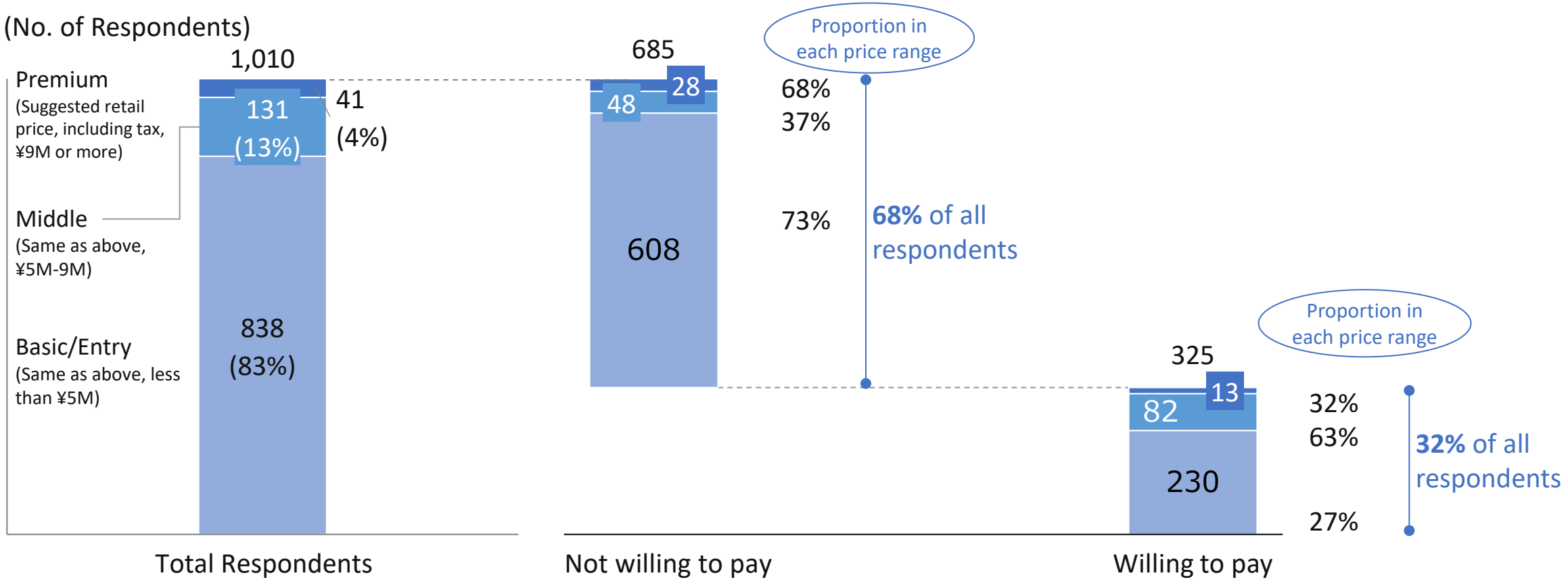
	Economy (Round-trip fare, including all taxes and surcharges ¥360 thousand)	Premium Economy (Same as left ¥560 thousand)	Business (Same as left ¥1.08M)
Total Respondents	816	118	76
Number of people willing to pay	344	77	37
(Proportion to the total)	(42%)	(65%)	(49%)
It benefits society as a whole and future generations	61%	55%	62%
Purchasing and owning green airline tickets is cool	11%	16%	12%
Fair compensation should be paid to companies for the cost increase associated with producing green aviation fuel.	44%	47%	59%
Products with high environmental value are recommended by people around me, as well as through media like TV and social media	11%	19%	12%
Others	2%	2%	1%

Common reason for all price range

Note) Due to weight-back aggregation based on demographics (gender and age) and rounding of decimal values, the addition, subtraction, multiplication, or division of figures on the slide may not match exactly.

(2) Results by products: EVs (1/3)

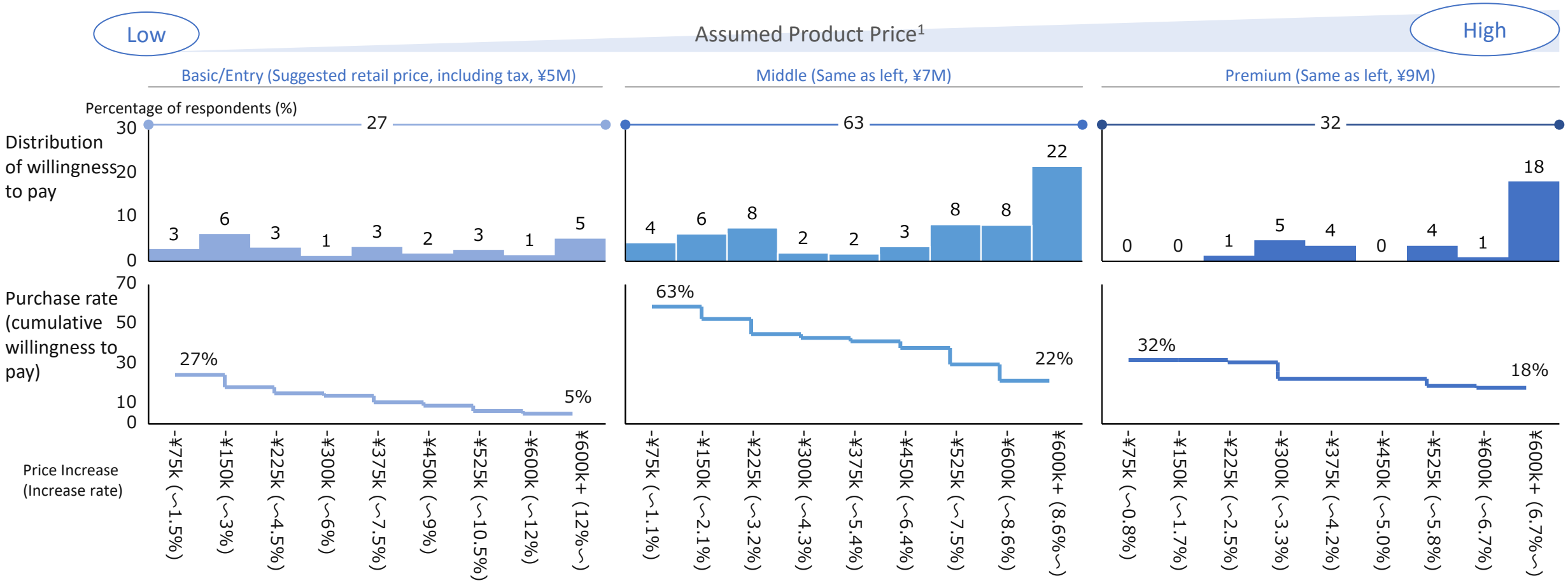
» For EVs, 83% of respondents chose basic or entry-level models, and 32% of the overall respondents expressed willingness to pay for added environmental value.



Note) Due to weight-back aggregation based on demographics (gender and age) and rounding of decimal values, the addition, subtraction, multiplication, or division of figures on the slide may not match exactly.

(2) Results by products: EVs (2/3)

The higher the price range, the more consumers are willing to pay the maximum amount presented.

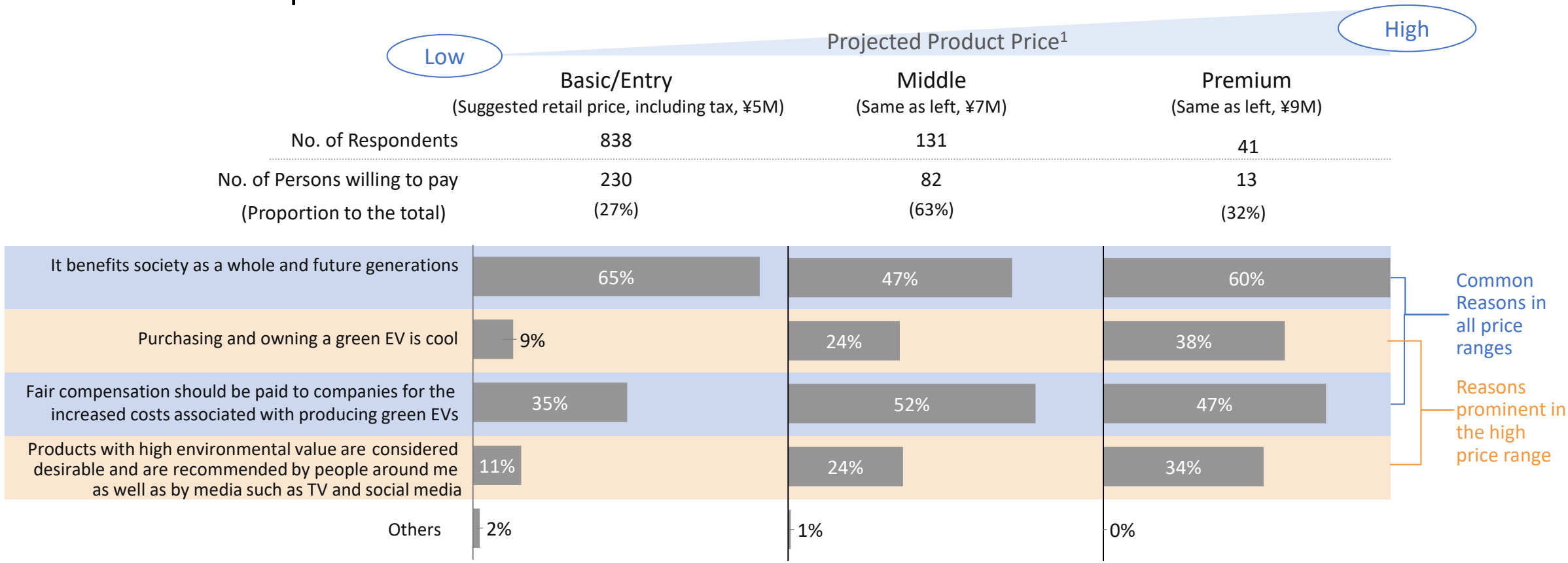


Note) Due to weight-back aggregation based on demographics (gender and age) and rounding of decimal values, the addition, subtraction, multiplication, or division of figures on the slide may not match exactly.

1. Each respondent was first asked about the price range of products they have purchased or considered buying. Following this, during the inquiry into willingness to pay, respondents were presented with a specific price within their price range and asked whether they would accept an increase in price.

(2) Results by products: EVs (3/3)

- As reasons for payment, contributing to society and supporting future generations, and providing fair compensation to companies were cited. Additionally, in higher price ranges, factors such as perceived "coolness" and influence from others were also mentioned.

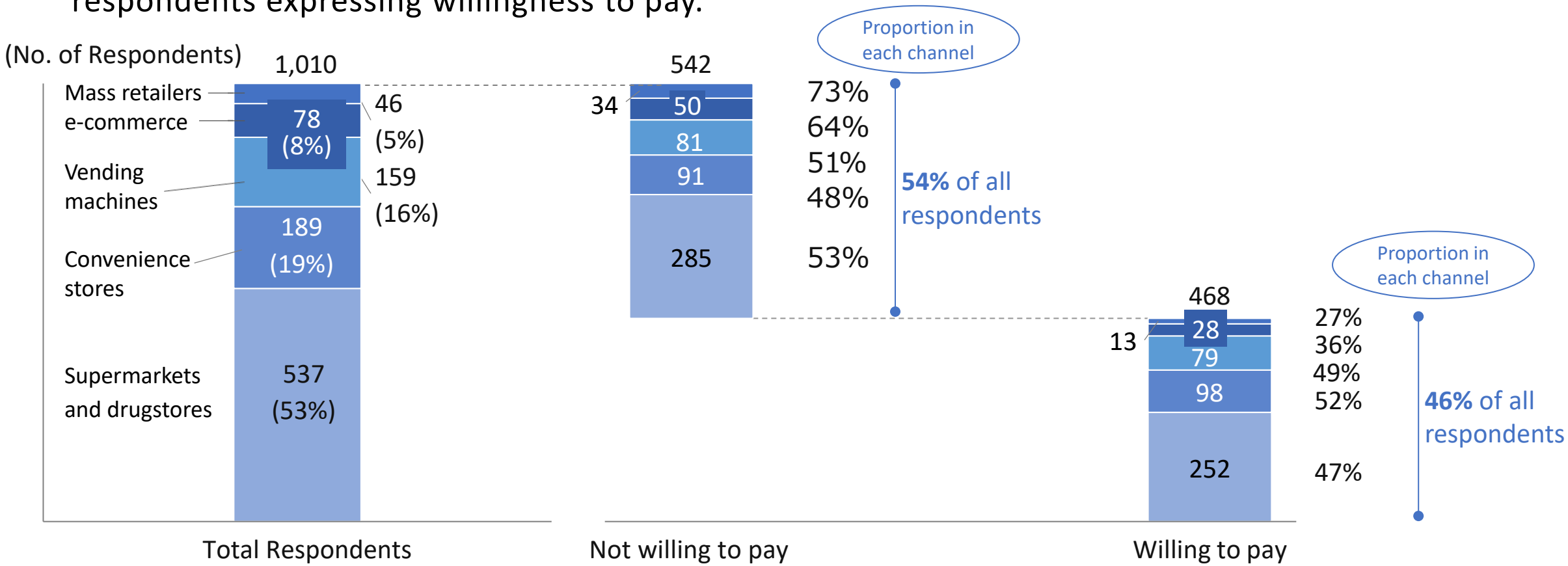


Note) Due to weight-back aggregation based on demographics (gender and age) and rounding of decimal values, the addition, subtraction, multiplication, or division of figures on the slide may not match exactly.

1. Each respondent was first asked about the price range of products they have purchased or considered buying. Following this, during the inquiry into willingness to pay, respondents were presented with a specific price within their price range and asked whether they would accept an increase in price.

(2) Results by products: PET Bottled Beverages (1/3)

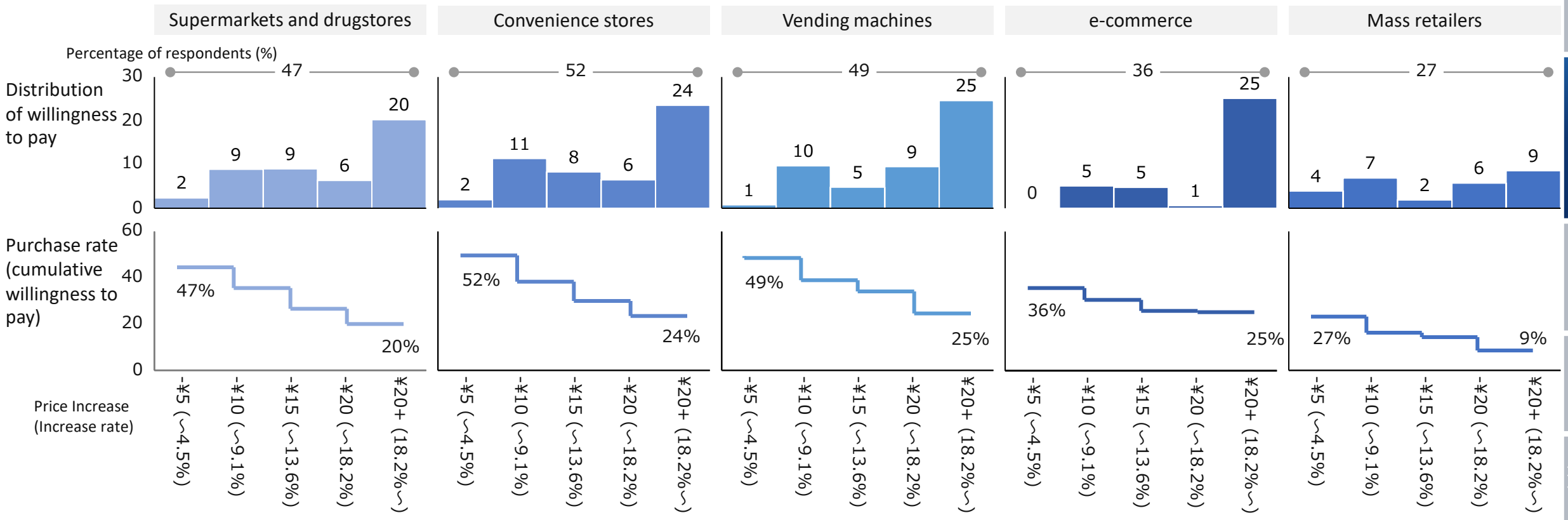
» For PET bottled beverages surveyed across purchase channels, approximately 80% were purchased from supermarkets, drugstores, convenience stores, and vending machines, with 46% of overall respondents expressing willingness to pay.



Note) Due to weight-back aggregation based on demographics (gender and age) and rounding of decimal values, the addition, subtraction, multiplication, or division of figures on the slide may not match exactly.

(2) Results by products: PET Bottled Beverages (2/3)

» At mass retailers, price sensitivity is high, with 70% of consumers unwilling to pay. In other channels, 50–60% of respondents are unwilling to pay, while over 20% are willing to pay the maximum amount for environmental value.



Note) Due to weight-back aggregation based on demographics (gender and age) and rounding of decimal values, the addition, subtraction, multiplication, or division of figures on the slide may not match exactly.

(2) Results by products: PET Bottled Beverages (3/3)

- Across all channels, contributing to society and supporting future generations, and providing fair compensation to companies were cited as reasons. In vending machines and e-commerce, influences from others and the media was also observed.

	Supermarkets and drugstores	Convenience stores	Vending machines	e-commerce	Mass retailers
No. of Respondents	537	189	159	78	46
No. of Persons willing to pay (Proportion to the total)	252 (47%)	98 (52%)	79 (49%)	28 (36%)	13 (27%)
It benefits society as a whole and future generations	63%	60%	53%	70%	39%
Purchasing and owning Green PET bottled beverages is cool	15%	19%	16%	10%	13%
Fair compensation should be paid for the increased costs associated with producing Green PET bottled beverages	43%	42%	39%	20%	44%
Products with high environmental value are considered desirable and are recommended by people around me as well as by media such as TV and social media	11%	13%	29%	27%	20%
Others	0%	1%	1%	0%	0%

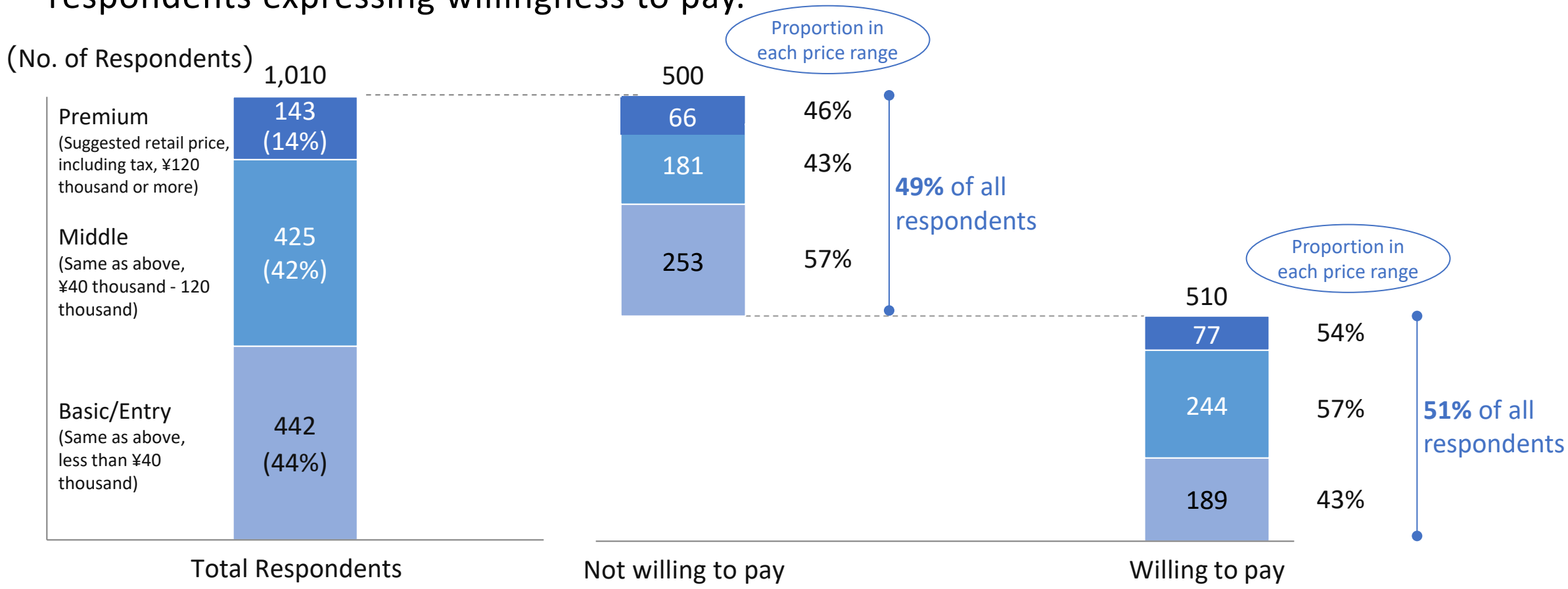
Common Reasons in all channels

Reason found in some channels

Note) Due to weight-back aggregation based on demographics (gender and age) and rounding of decimal values, the addition, subtraction, multiplication, or division of figures on the slide may not match exactly.

(2) Results by products : Smartphones (1/3)

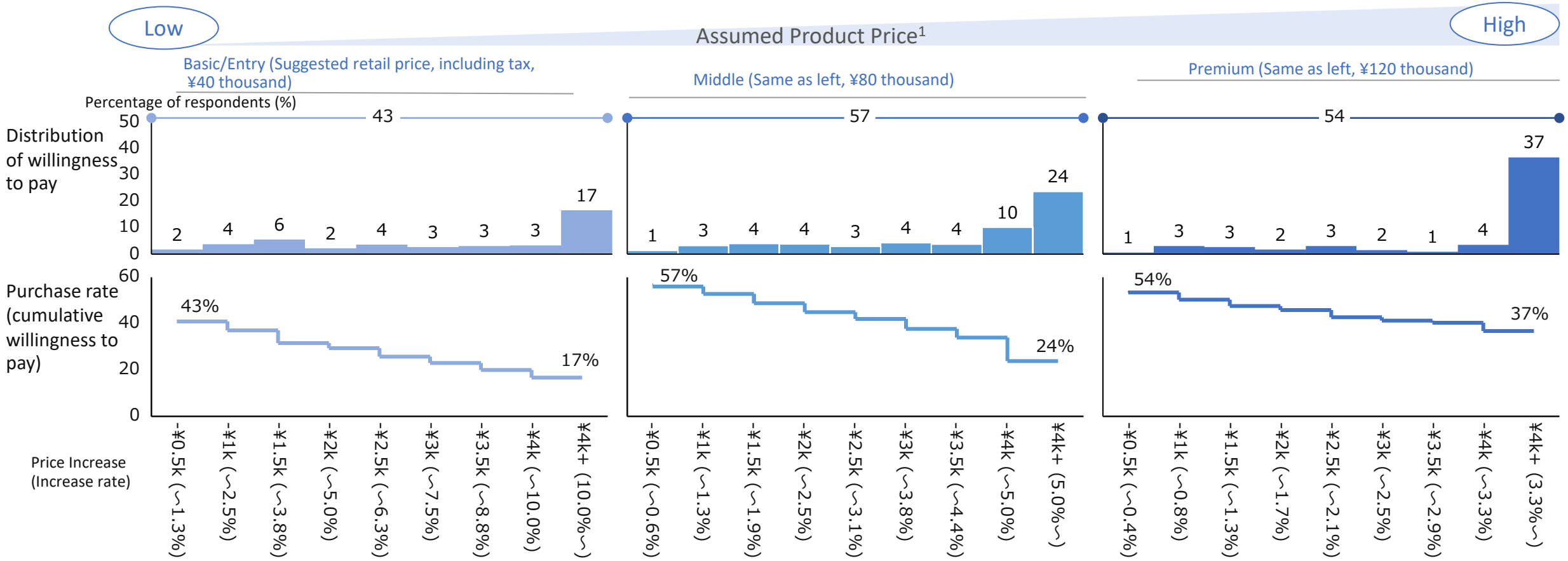
Basic, entry, and middle price range users account for 86% of the total. Approximately half of respondents expressing willingness to pay.



Note) Due to weight-back aggregation based on demographics (gender and age) and rounding of decimal values, the addition, subtraction, multiplication, or division of figures on the slide may not match exactly.

(2) Results by products: Smartphones (2/3)

40–50% show a willingness to pay for environmental value, particularly in the premium segment, where decline in willingness remains low even at the maximum price increase.



Note) Due to weight-back aggregation based on demographics (gender and age) and rounding of decimal values, the addition, subtraction, multiplication, or division of figures on the slide may not match exactly.

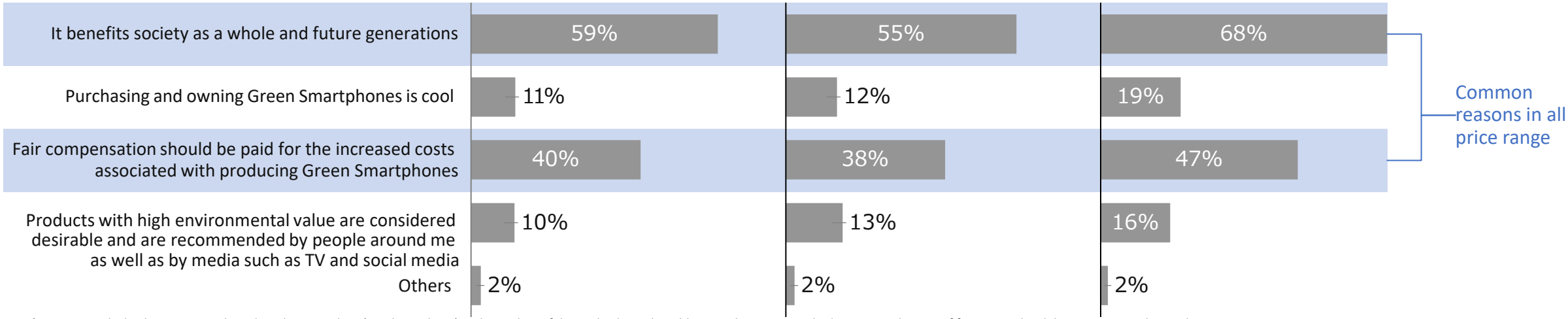
1. Each respondent was first asked about the price range of products they have purchased or considered buying. Following this, during the inquiry into willingness to pay, respondents were presented with a specific price within their price range and asked whether they would accept an increase in price.

(2) Results by products: Smartphones (3/3)

The primary reasons for paying for environmental value are contributing to society, supporting future generations, and providing fair compensation to companies.

Low — Projected Product Price[1] — High

	Basic/Entry (Suggested retail price, including tax, ¥40 thousand)	Middle (Same as left, ¥80 thousand)	Premium (Same as left, ¥120 thousand)
No. of Respondents	442	425	143
No. of Persons willing to pay	189	244	77
(Proportion to the total)	(43%)	(57%)	(54%)



Note) Due to weight-back aggregation based on demographics (gender and age) and rounding of decimal values, the addition, subtraction, multiplication, or division of figures on the slide may not match exactly.

1. Each respondent was first asked about the price range of products they have purchased or considered buying. Following this, during the inquiry into willingness to pay, respondents were presented with a specific price within their price range and asked whether they would accept an increase in price.

Overseas Case: (1) Swedish Specialty Steel Manufacturer OVAKO (1/2)

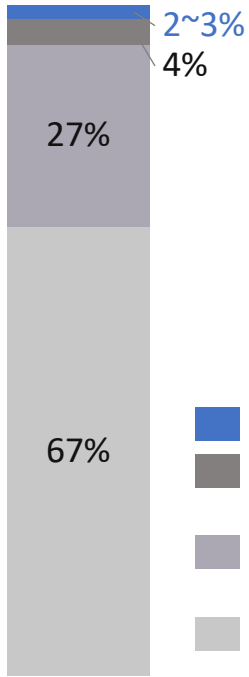
» Ovako has introduced a flat €30-per-ton “climate surcharge” (equivalent to 2–3% of the product price) to pass through the additional costs of producing green steel using clean electricity, hydrogen, and carbon credits.

Company Profile

Location	• HQ：Stockholm • Manufacturing site：9 sites in the South Sweden
Revenue (2023)	• 144 billion JPY – Ref.) It produces 508 thousand ton, the largest in North Europe
No. of Workers	2,882 persons
Main Products	High-Quality Bearing Steel • Performance: durability and wear resistance. • Environmental Aspect: **CO2 emissions per ton are less than 20% of the industry average**, achieved by using 97% recycled scrap materials, clean electricity, hydrogen, and carbon credits.
Clients	Material Manufacturers: OVAKO Parts Manufacturers: SCHAEFFLER (German Bearing manufacturer), SKF (Swedish Bearing Manufacturer), FN STEEL (Dutch wire manufacturer) OEM: VOLVO, Polestar, Vestas, ⋯ and others

Overview of Price Pass-Through

Breakdown of Selling Price[1]



Summary of Climate Surcharge

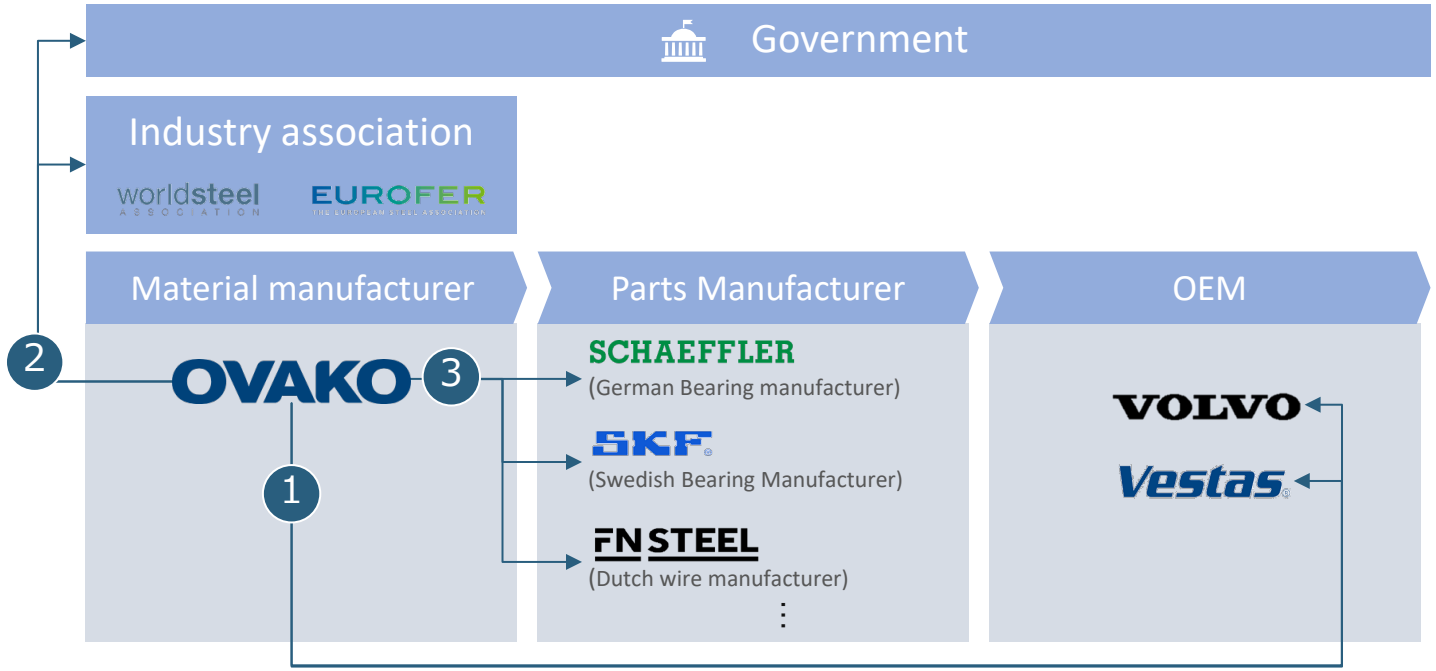
Timing of price pass-through	January 2022 (Prior to this, No price pass-through was applied to sales prices despite top-level environmental responsiveness in the industry.)
Pass-through amount	Flat rate of 30 EUR/t (approximately 2–3% of the product price).
Triggering event	SSAB and Stegra (both Swedish steel manufacturers), which have higher emissions than Ovako, have successfully implemented price pass-through for green steel.

1. As Ovako’s base prices are not disclosed, they are estimated based on the typical market prices of specialty steel.
Source） Ovako, https://www.ovako.com/globalassets/downloads/sustainability/ovako_path_to_carbon-neutrality.pdf; https://www.ovako.com/en/about-ovako/; https://www.nordea.com/en/news/ovako-almost-all-new-business-won-in-the-past-year-has-a-strong-sustainability-profile and others.

Overseas Case: (1) Swedish Specialty Steel Manufacturer OVAKO (2/2)

» Ovako achieved price pass-through through ① direct sales to end-product manufacturers, ② advocacy efforts targeting government and industry associations, and ③ internal and external communication led by the CEO.

Ovako's Actions for Price Pass-Through



Key Success Factors

1 Direct sales to end-product manufacturers

- Engaged in discussions with OEMs, who influence the entire supply chain, about green products to build consensus for price pass-through.

2 Advocacy with government and industry association

- To ensure fair recognition of its lower-emission products, Ovako proposed green steel standard-setting to industry associations and recommended requirements for end-product manufacturers to the government.

3 CEO-led internal and external communication

- To customers, price pass-through was communicated via a "CEO letter."
- Internally, decisions were made top-down, aligning internal KPIs to clarify priorities.

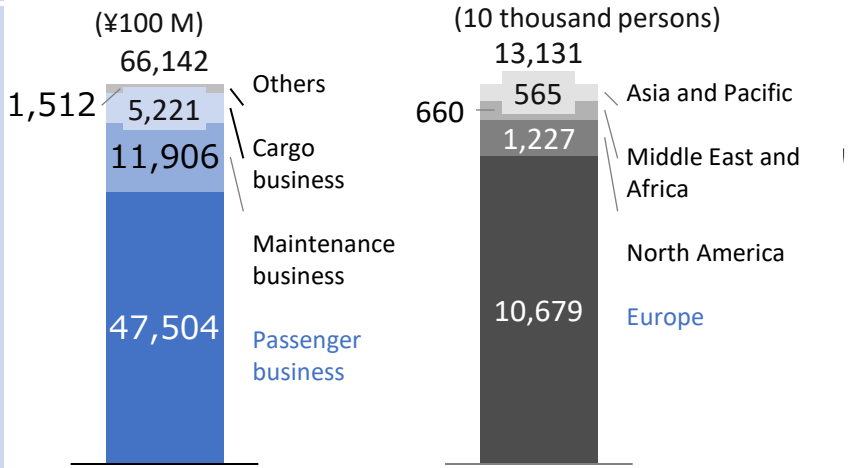
In addition to direct customers, Ovako involved end-product manufacturers, the government, and industry associations to promote the value of green steel and to foster acceptance of price pass-through in supply chain.

Source) Ovako, https://www.ovako.com/en/newsevents/stories/green-steel-the-uncomfortable-truth/?utm_source=chatgpt.com and others.

Overseas Case: (2) German Airline Lufthansa (1/2)

Lufthansa passes on the cost of SAF usage through two methods: a mandatory environmental surcharge and an optional green fare.

Company Profile

Location	• HQ is in Cologne, Germany • Destinations cover over 300 cities in approximately 100 countries
Revenue (2024)	6614.2 billion JPY
No. of Workers	101,709 persons
Main Services (2024)	

Overview of Price Pass-Through

	Environmental surcharge	Green fare
Background	To address ReFuelEU Aviation, a 2% SAF was blended, and the increased costs were passed on to customers.	Meeting the demands of environmentally conscious customers, including individuals and companies with a higher proportion of Scope 3 emissions such as finance, consulting, and IT.
Introduction timing	January 2025	February 2023
Measures to reduce emissions	SAF	SAF and Credits
Applicable routes	Flights departing from Europe	All routes
Amount of Price Increase[1]	0.7-2%	Up to 21%
Mandatory or Optional	Mandatory	Optional

1. As of July 2025, for the Frankfurt → Los Angeles route, the environmental cost surcharge is the publicly disclosed additional amount compared to the Basic price, while the green fare is the Green price compared to the Basic price.
Source) Lufthansa, https://www.lufthansa.com/gr/en/green-fare; https://www.lufthansa.com/mt/en/discover-lufthansa/carbon-offsetting/environmental-cost-surcharge; https://investor-relations.lufthansagroup.com/en/corporate-facts/key-data/lufthansa-group.html and others.

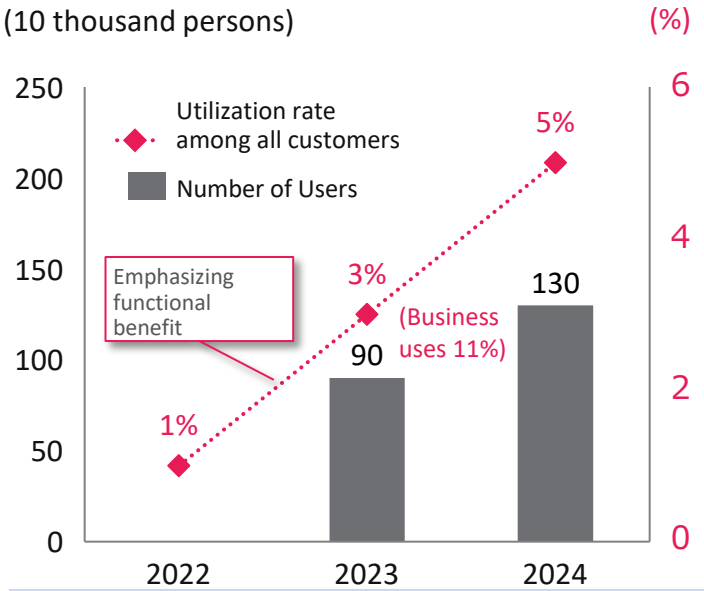
Overseas Case: (2) German Airline Lufthansa (2/2)

» In addition to environmental value, mileage points, booking flexibility, and annual contracts emphasizing Scope 3 measures for corporate clients have increased green fare usage and number of users, both in terms of absolute number and proportion.

Lufthansa's Actions

	For Individuals	For Corporate Clients
Information Disclosure	To address greenwashing criticism, detailed information is disclosed. • SAF blend ratios • SAF credits, along with project details and CO2 emission reductions.	
Benefit Provision	• Mileage and point rewards (+10–20% extra compared to standard) • Free reservation changes ※Priority boarding and priority baggage claim have also been considered.	• Support customer branding (publicly disclose corporate users of green fares) • Fix SAF fees annually to mitigate price fluctuations
Integration of marketing and sales	• Improved visibility of options on the booking screen • Campaigns aligned with peak seasons	• Annual contracts directly signed with companies that frequently use business travel (without intermediaries such as agencies).

Green Fare Sales Performance



Initially, the green fare focused solely on promoting environmental value, resulting in limited users. After benefits were introduced, the number of users increased.

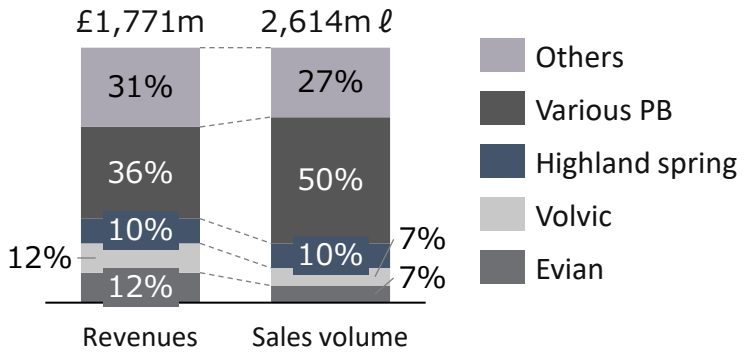
In addition to environmental value, offering other benefits and improving consumer loyalty through corporate contracts effectively increased purchases.

Sources) Lufthansa, https://investor-relations.lufthansagroup.com/fileadmin/downloads/en/more/LH-Factsheet-Sustainability-2023.pdf?utm_source=chatgpt.com; https://newsroom.lufthansagroup.com/en/one-year-of-green-fares-at-the-lufthansa-group-more-than-one-million-passengers-choose-new-fare-for-more-sustainable-travel/?utm_source=chatgpt.com; https://newsroom.lufthansagroup.com/en/200000-guests-in-100-days-successful-launch-of-green-fares-at-the-lufthansa-group/?utm_source=chatgpt.com and others

Overseas Case: (3) British Bottled Water Manufacturer (1/2)

Highland Spring gradually introduced the 'eco bottle,' made from 100% recycled PET, passing on environmental value to both wholesale and retail prices.

Company Profile

Location	HQ, Water Sources, Plant sites are all in Scotland, UK
Market Share	
No. of Workers	Approximately 400 persons
Products	Mineral Water • Available in variations such as still/sparkling, plain/flavored, and PET bottles/glass bottles.
Environ-mental measures	Using recycled PET for bottles, • The first beverage manufacturer in the UK to introduce 100% recycled PET bottles. • Aiming for all products to use 100% recycled PET by 2030.

Overview of Price Pass-Through

Changes in the product

Conventional product → 100% Recycled PET "eco bottle" (Changes)

- Bottles
  Slightly gray bottles. But contents can be seen clearly.
- Labels
  ”Eco bottle" is written in a size second only to the brand name.

※No changes to the caps or the beverages.

Efforts for Introduction

Introduce in two stages: Pilot period (June-Sep. 2018) and official Launch (Jan. 2019-)
See details in next page

Amount of Price Increase

Environmental values are fully passed on. (after official launch)
- Highland Spring passed on its costs to wholesale prices for convenience stores and supermarkets.
- While retailers set their own pricing, some leveraged inflation to raise prices by up to 25%.

Source) Highland Spring, https://highlandspring.com/product-range/100-recycled/; https://highlandspring.com/highland-spring-group-annual-results-to-31-december-2023/ and others.

Overseas Case: (3) British Bottled Water Manufacturer (2/2)

Highland Spring decided on the official launch based on feedback from consumers who compared the new and old bottles during the pilot period. The expansion of the product lineup was also carefully selected, considering consumer attributes and profitability.

	Pilot period (June-Sep. 2018)	Official launch (Jan. 2019)
Objective	Understand consumer acceptance of the color of recycled PET and price increase (without price pass-through).	Expand recycled PET products and price pass-through
Channels	TESCO Sainsbury's (Both are major retailers)	All channels
Key points in the preparation phase	• Placing the existing bottle and the eco bottle side by side to conduct consumer interviews and collect POS data. • Results: - 65% of consumers did not notice the difference between the bottles. - 60% of consumers accepted a price increase of 5 pence (approx. 10 JPY). - 30% of eco bottle purchases were motivated by environmental protection. - Identified locations and consumer attributes where the eco bottle is more likely to be chosen.	Expand eco bottle products based on 2 aspects **Consumer Acceptance** start to sell products with consumer acceptance **Effects on Profits** Even if consumers defect, the impact on the entire company can be minimized.

	for kids 330ml	for sports 750ml
Consumer Acceptance	Parents enthusiastic about environmental education show high acceptance.	The demand is primarily driven by environmentally conscious younger generations.
Effects on Profits	The impact of failure is minimal due to the small sales ratio	High profit rate and most significant SKU
	Early period (introduced in May 2019)	Latter Period (introduced in April 2020)

By involving retailers and thoroughly understanding consumer purchase intentions, while ensuring no negative impact on profitability, they expanded the range of products using recycled PET and successfully implemented price pass-through.

Source) Highland Spring, https://www.edie.net/highland-spring-rolls-out-uks-first-100-recycled-water-bottle/; https://www.circularonline.co.uk/news/highland-spring-launches-100-recycled-bottle-after-successful-trial/ and others

Summary of Questionnaire Findings and Overseas Case Studies

Summary of and Case Studies

Consumer Questionnaire

For the four products—airline tickets, EVs, PET bottled beverages, and smartphones—30–50% of consumers have a willingness to pay extra for environmental value, forming a growing volume segment.

- ✓ For airline tickets, EVs, and smartphones, consumers with a willingness to pay are most concentrated in the mid-price range, followed by the high and low-price ranges.
- ✓ For PET bottled beverages, surveyed by purchase channel, clear differences emerged: users of supermarkets, convenience stores, and vending machines showed some level of acceptance for environmental value.

Overseas Price Pass-Through Case Studies

OVAKO

Green materials actively create demand for green products through communication with downstream customers, as well as advocacy to end-product manufacturers and regulatory bodies.

Lufthansa

For end consumers, promoting environmental value alone is not enough; instead, offering additional benefits and enhancing loyalty through corporate contracts helps drive the purchase of environmental value options.

HIGHLAND SPRING

When implementing price pass-through, involve retailers to thoroughly understand purchasing intentions. Ensure there is no negative impact on profitability while gradually adding and passing on environmental value.

Implication for Environmental value pass-through in Japan

The Need to Meet Demand for GX-driven products

As there are already consumers whose willingness to pay exceeds environmental costs, the early launch of GX-driven products can rise consumer awareness, expand demand, and spur investment in mass production.

Methods for commercializing GX-driven products:

(1) Promoting price pass-through across the supply chain

Deepen understanding of the significance and value of GX-driven products across the supply chain and among end consumers. This ensures that all players, from raw materials to final goods, implement price pass-through, while maintaining stable profitability and ensuring the supply of GX-driven products.

(2) Providing additional benefits beyond environmental value

Based on consumer needs and mechanism of willingness-to-pay, enhance the functional value of GX-driven products to drive actual purchases, where their environmental value alone may seem costly.

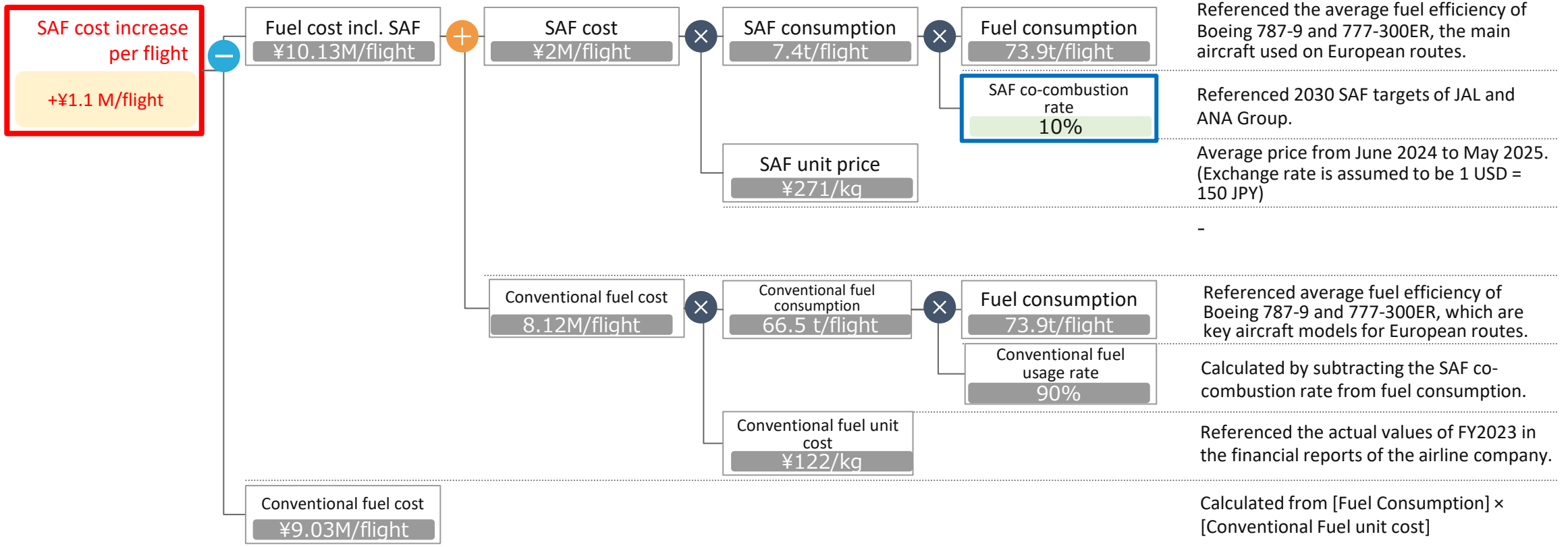
(3) Strategic selection of sales channels and target models

Use high-precision data gathered from sales channels and consumer feedback to design models, segments, and channels with higher acceptance of additional payments for environmental value.

Appendix: Supply Side Analysis

The Haneda-Frankfurt route, with high passenger transport volume (total seat-kilometers), was selected to estimate the cost increase from a 10% SAF co-combustion.

Calculation Logic: Aviation Fuel (Haneda-Frankfurt Route)



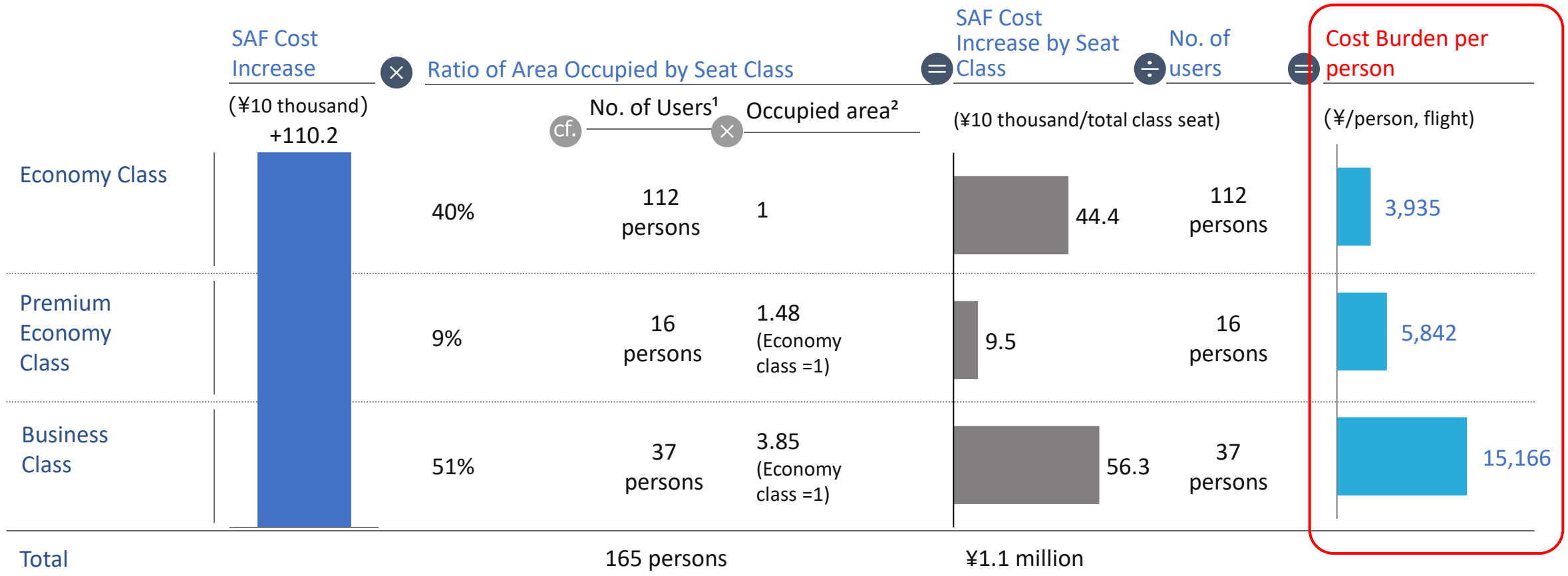
Notes

- Referenced the average fuel efficiency of Boeing 787-9 and 777-300ER, the main aircraft used on European routes.
- Referenced 2030 SAF targets of JAL and ANA Group.
- Average price from June 2024 to May 2025. (Exchange rate is assumed to be 1 USD = 150 JPY)
- -
- Referenced average fuel efficiency of Boeing 787-9 and 777-300ER, which are key aircraft models for European routes.
- Calculated by subtracting the SAF co-combustion rate from fuel consumption.
- Referenced the actual values of FY2023 in the financial reports of the airline company.
- Calculated from [Fuel Consumption] × [Conventional Fuel unit cost]

Note: The numbers presented are rounded from values with hidden digits, which may result in discrepancies when calculating values directly from those shown on the slide.
Source: OAG Data "Worldwide for 2023", ICAO Carbon Emission Calculator, etc.

Appendix: Supply Side Analysis

When SAF is used, cost increase per seat area is estimated at 3,935 JPY per person for economy class and 15,166 JPY per person for business class.



1. As data on occupancy rates by seat class is unavailable, the average occupancy rate for ANA international flights, "77.3%", is applied to calculate the utilization rate for each seat class by multiplying it by the number of seats.
2. The "Y seat Factor" from the ICAO Carbon Emission Calculator is referenced.
Source: OAG Data "Worldwide for 2023"; ICAO Carbon Emission Calculator, etc.

Appendix

Launch of GX Future Lab

Appendix: Launch of GX Future Lab

GX Future Lab has been launched.

- The research findings prepared by staff members of GX Acceleration Agency are compiled as the “GX Future Lab.” These publications are available on our website for the purpose of receiving broad feedback from academia and research institutions, and of incorporating those feedback contributions into future research. Please note that all content is authored solely under the responsibility of each individual staff member and does not represent the official views of GX Acceleration Agency.

GX Future Lab No.1 “Understanding the Decline in Japan‘s CO2 Emissions: Evidence from Factor Decomposition” （Report）

Author：**Yasuaki Amatatsu** Ph.D. in Economics

The analysis breaks down the changes in CO2 emissions into factors such as variations in economic activity (production levels), advancements in energy efficiency, and the transition to renewable energy sources. Past reductions in CO2 emissions have been largely driven by efforts toward energy efficiency improvements.

To achieve carbon neutrality by 2050, in addition to promoting energy efficiency, further efforts will be needed to shift from CO2-emitting thermal power generation to CO2-free sources like solar power, wind power, and nuclear power. Moreover, fuel and material transitions in industries such as manufacturing must also be actively pursued.

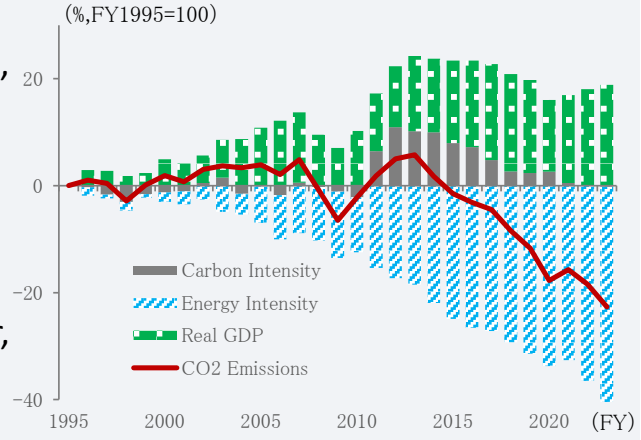


Figure: Factor Decomposition of CO2 Emissions

GX Future Lab No.2 “Assessing the Greenium of Transition Bonds in Japanese Electric Power Bonds: Evidence from Japan’s Utility Sector” （Working Paper）

Author：**Yasuaki Amatatsu** Ph.D. in Economics

Electric power companies are required to promote Green Transformation (GX), involving a shift from CO2-emitting thermal power generation to CO2-free power generation methods such as nuclear power and hydrogen co-combustion thermal power. As a result, it is anticipated that electric power companies will increasingly issue transition bonds to fund initiatives like restarting or constructing nuclear power plants.

This paper examines the transition bonds of electric power companies and demonstrates, through quantitative analysis (panel data analysis), that "greenium" exists or occurs—where the yield on transition bonds is lower than that of ordinary bonds—similar to green bonds.

*The English editions are published on our website.