



Medium-term Outlook for Japanese Industry

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Mizuho Bank Industry Research Department
Research & Consulting Unit
Mizuho Financial Group

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1. Industry Overview

Responding to changing trends and resolving issues as domestic demand and production shrink

I. Business Environment	<p>(Short term)</p> <ul style="list-style-type: none"> ■ Manufacturing industries will see a drop in exports associated with slowing overseas economies, which will weigh on production activities through 2024. Non-manufacturing industries will be boosted by a full resurgence of inbound tourism <p>(Medium term)</p> <ul style="list-style-type: none"> ■ Structural changes will surface from 2025 onwards, such as Japan's shrinking population, and sluggish exports of key industries due to increased overseas competition <p>Materials, automotive, and other key industries will see declining domestic demand and will have to confront the rise of China. Product and manufacturing processes are also changing in the pursuit of decarbonization. As for electronics and IT-related industries, generative AI and other technological evolutions will offer digitalization opportunities as markets steadily expand. The energy industry will have to tackle the great challenge of balancing transforming supply structures with ensuring stable supply as the world head towards decarbonization. Amidst a tightening energy-supply demand, procurement competition will intensify. The lifestyle and social infrastructure industry is centered on domestic demand, so downward pressure on demand due to population decline will intensify even further. Labor shortages will become even more serious. In the healthcare industry, the market will expand steadily amidst growing needs for more efficient medical care against the backdrop of an aging society and Japan's shrinking population.</p>
II. Mid-Term Challenges	<ul style="list-style-type: none"> ■ Adapting to digitalization and manifestations of environmental value will be growth areas in response to changes in the business environment. Conventional areas with low added values will shrink. ■ Japanese industry will face three major challenges over the mid-term due to changes in business environments: <ul style="list-style-type: none"> — Japanese industry and companies should secure their presence in growth areas created by digital transformation and decarbonization trends — Companies should maintain competitiveness in the face of structural declines in domestic demand, intensified competition from overseas, and changes in the demand structure — Companies should respond to constant supply constraints and additional costs arising from decarbonization, supply chain disruptions, and the ongoing shrinking population
III. Mid-Term Strategies	<ul style="list-style-type: none"> ■ Japanese industry must engage in strategic alliances, structural transformation and structural reform, and strengthen its resilience from a mid to long-term perspective <p>(Initiatives for Strategic Alliances)</p> <ul style="list-style-type: none"> ■ Digitalization and other such areas will create new demand areas. Vertical collaboration and integration across layers will be required if industries are to thrive in these areas ■ Horizontal alliances will be necessary to maintain competitiveness given the constant supply constraints in terms of people, resources, and energy <p>(Initiatives for Structural Transformation and Structural Reform)</p> <ul style="list-style-type: none"> ■ The materials industry in particular must optimize supply capacity, focusing on overall efficiency. Diversion of supply capacity based on fuel conversion is one option ■ Business models will require radical change to break away from existing domains that are becoming legacy due to changes in demand structures <p>(Initiatives to Strengthen Resilience)</p> <ul style="list-style-type: none"> ■ The supply chain must be strengthened and rebuilt amidst potential future geopolitical risks and trends towards decarbonization. Upstream resource procurement must be diversified, supply systems must be restructured, and collaborative relationships within the supply chain must be strengthened ■ Sustainable and stable business foundations must be established to prepare for constant supply constraints in domestic demand-oriented industries that are susceptible to population decline. DX must be promoted, technologies must be used to increase efficiency, and new revenues sources must be secured

Source: Compiled by Mizuho Bank Industry Research Department

This report considers an overall strategy for Japanese industry based on the business environment and challenges facing each of five industrial segments

- This report on Japanese industry overall describes the business environment (trends in supply and demand and competitive environment) and the challenges for a total of 24 industries organized into five industrial segments, based on which an overall picture of strategies to take in the mid-term is derived.

Five industrial segments

	Industrial segments	Industries	Positioning, characteristics
1	Materials, automotive	Chemicals, steel, non-ferrous metals, automotive	<ul style="list-style-type: none"> ■ The key industries that have driven Japan's exports and domestic production
2	Electronics, IT	Semiconductors, electronic components, finished products, telecommunications, media services, IT services	<ul style="list-style-type: none"> ■ While these are growth fields, these industries are up against fierce global competition
3	Energy	Oil, electric power, city gas	<ul style="list-style-type: none"> ■ Industries that underpin all social and economic activities and are directly linked to the competitiveness of domestic production
4	Lifestyle, social infrastructure	Processed food, construction, rail, logistics, aviation, retail, real estate, lodging	<ul style="list-style-type: none"> ■ Industries based on domestic demand that provide services closely linked to everyday life
5	Healthcare	Pharmaceuticals, medical devices, medical, nursing care	<ul style="list-style-type: none"> ■ Industries that support Japan's super-aging society and people's well-being

Composition of this chapter

Chapter I: Business Environment

Overview of supply and demand trends and competitive environment for the 5 segments

Chapter II: Mid-Term Challenges

Identification of key structural challenges in light of changes in the business environment

Chapter III: Mid-Term Strategies

Breakdown and discussion of overall strategies to address the key structural challenges in Section II

Strategic directions required of Japanese industry over the next five years

- Future strategic directions of Japanese industry based on the business environment

Mid-term issues derived from changes in the business environment and strategic directions to mitigate these issues

I . Business Environment			II . Mid-Term Challenges
External factors Japan's shrinking population CN efforts Geopolitical divisions due to emphasis on economic security Constant supply constraints Digitalization Rise of China Underlying domestic inflation	1	Materials automotive <ul style="list-style-type: none"> Facing structural stagnation in domestic demand and intensifying competition with China, particularly in general-purpose products Shrinking area Product and manufacturing processes are changing amidst decarbonization trends <ul style="list-style-type: none"> Increasing demand for high-performance, high-value-added materials due to the shift to BEVs Growth area 	Japanese industry must secure its presence in growth areas created by digital transformation and decarbonization trends Competitiveness must be maintained amidst structural declines in domestic demand, intensified competition from overseas, and changes in the demand structure Constant supply constraints and additional costs arising from decarbonization, supply chains disruptions, and the ongoing shrinking population must be addressed
	2	Electronics, IT <ul style="list-style-type: none"> The high-tech industry is performing well amidst digitalization trends <ul style="list-style-type: none"> Advanced semiconductors and software consulting are becoming more important as generative AI use becomes more widespread Growth area Advances in telecommunications are creating new demand areas, such as spatial devices Growth area Procurement, manufacturing, and logistics inefficiencies due to supply chain disruptions 	
	3	Energy <ul style="list-style-type: none"> Demand is shrinking due to energy conservation, improved fuel efficiency, fuel conversion, and other trends Shrinking area Renewable energy demand is increasing due to fuel conversion for CN. In addition, a stable supply is essential Growth area 	
	4	Lifestyle, society Infrastructure <ul style="list-style-type: none"> Increasing downward pressure on demand due to the structural slump in domestic demand, as well as intensifying competition between business categories <ul style="list-style-type: none"> Demand for inbound tourism is increasing. Consumption quality will change with economic growth in emerging countries Growth area The labor shortage is becoming even more severe, particularly in construction and logistics, amidst Japan's shrinking population and other "2024 problems" Shrinking area 	
	5	Healthcare <ul style="list-style-type: none"> The market is expanding along with an aging society and advancements in medical care Advanced and efficient medical care will become even more important as the labor shortage intensifies <ul style="list-style-type: none"> There is growing demand for solutions for medical devices that utilize AI, such as SaMD Growth area 	

III . Mid-Term Strategies

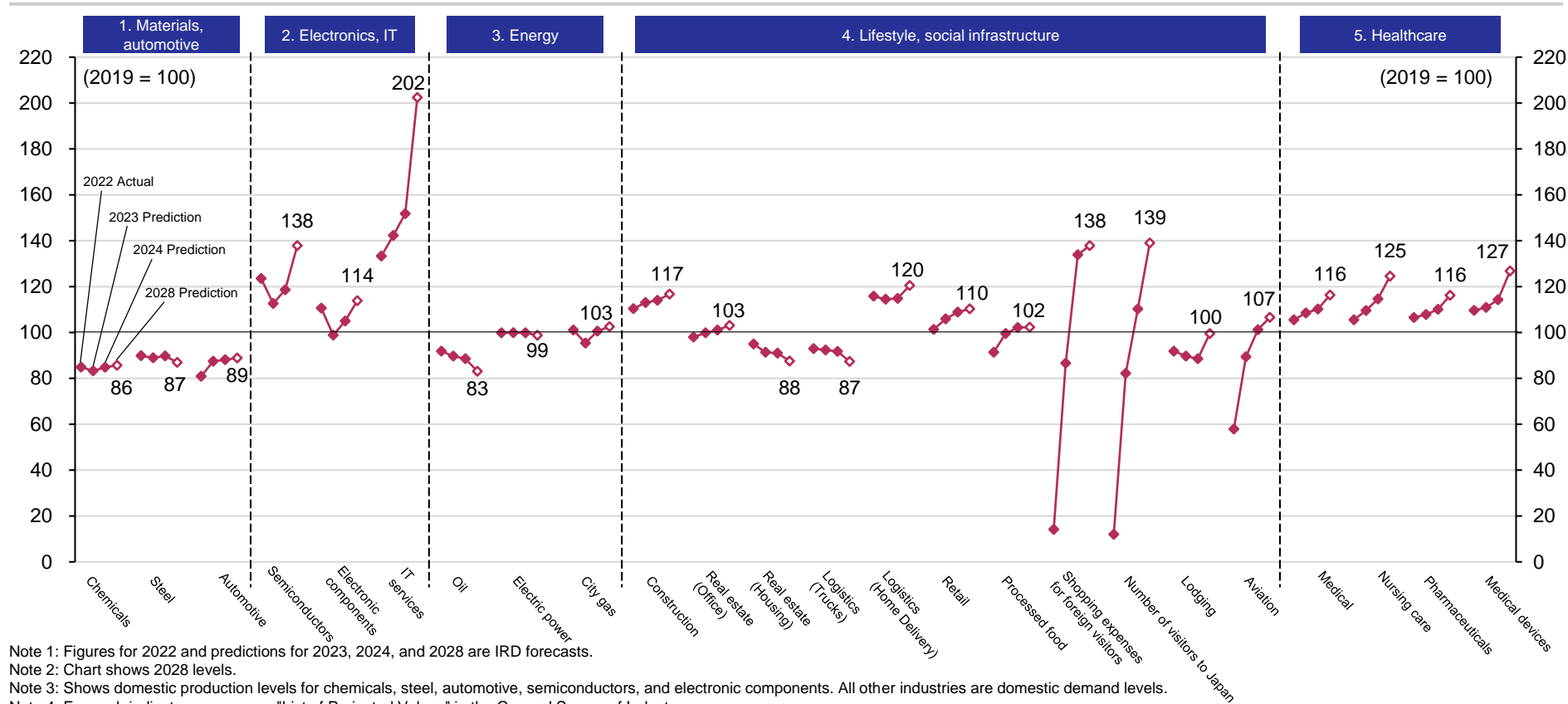
Strategic alliances	Structural transformation and structural reform	Strengthening resilience
<ul style="list-style-type: none"> ✓ Create new value through vertical collaboration and integration ✓ Diversify costs and economies of scale through horizontal collaboration 	<ul style="list-style-type: none"> ✓ Optimize supply capacity (overall optimization, diversion) ✓ Transform business models 	<ul style="list-style-type: none"> ✓ Strengthen and rebuild the supply chain ✓ Build a sustainable and stable business foundation

Source: Compiled by Mizuho Bank Industry Research Department

Mid-term downward pressure on key industries and domestic demand-oriented industries due to structural factors

- Domestic demand and production levels will see increasing downward pressure through to 2028 due to structural factors, such as Japan’s shrinking population and sluggish exports of key industries due to increased overseas competition
 - Electronics and IT are expected to grow in response to the growing trend toward digitalization. Inbound tourism demand is expected to continue to grow. The healthcare market is expected to expand in line with the aging society

Mid-term outlook for domestic production and demand levels by industry (to 2028)



Note 1: Figures for 2022 and predictions for 2023, 2024, and 2028 are IRD forecasts.

Note 2: Chart shows 2028 levels.

Note 3: Shows domestic production levels for chemicals, steel, automotive, semiconductors, and electronic components. All other industries are domestic demand levels.

Note 4: For each indicator source, see "List of Projected Values" in the General Survey of Industry.

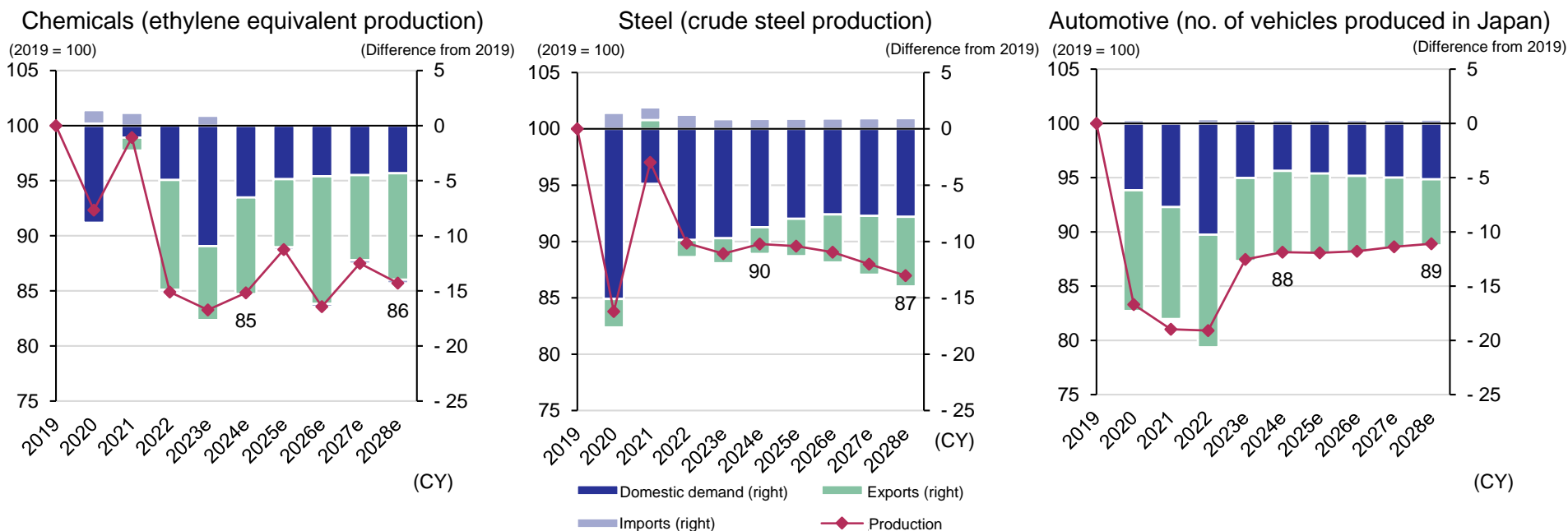
Note 5: Please refer to the sections on each industry for the sources for each indicator.

Source: Compiled by Mizuho Bank Industry Research Department based on various materials

Japan's key industries remain sluggish due to the structural slump in domestic demand and increasing competition with China

- Material and automotive production recovery is weak overall due to sluggish domestic demand caused by a shrinking population and a declining number of households. 2028 production levels are weighed down by sluggish exports amidst increasing competition overseas and will not return to pre-pandemic (2019) levels
 - Chemicals: Demand industries are recovering, but the slump in domestic demand that has been occurring since 2023 is only expected to recover slowly. Export levels are also significantly lower than before the pandemic as Japan's largest export destination, China, is progressing in its self-sufficiency
 - Steel: Domestic demand is expected to peak in 2026 and decline thereafter due to lower demand for automobiles and construction in light of fewer household numbers and changes in the demand structure from the shift to BEVs in automobiles. Exports are also declining due to intensified competition with China, particularly in the field of general-purpose products
 - Automotives: Domestic demand is expected to shift towards a decline from 2025 onwards due to fewer households. Exports are expected to have narrow increases with modest growth in the global market, but production levels will not return to pre-pandemic levels

Mid-term outlook for domestic production by industry



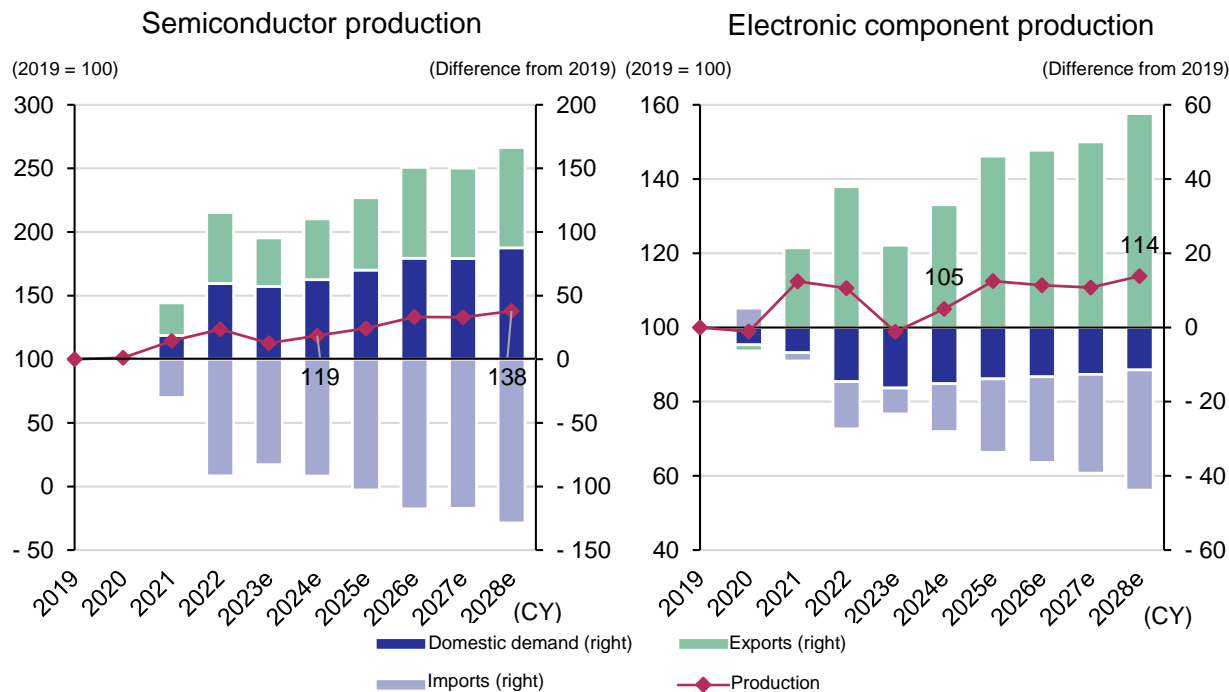
Note: All figures for 2023 onwards are IRD forecasts

Source: All figures compiled by Mizuho Bank Industry Research Department based on various materials

The market is growing steadily amidst increasing digital opportunities and digitalization

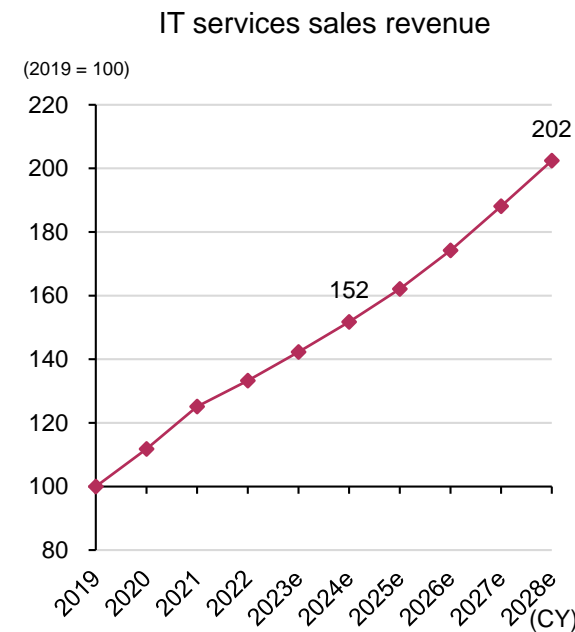
- The market is expected to grow steadily due to the growing digitalization of companies and governments and the evolution of technologies such as generative AI
 - Semiconductors and electronic components: As the finished product market returns to a growth trajectory, expansion in production is anticipated, primarily for exports. This will be driven by factors such as high-performance enhancements of products and increased occupancy due to the electrification of automobiles. In addition, the spread of generative AI is increasing demand for data centers, and new construction and expansion of domestic semiconductor plants will contribute to an increase in production levels in the mid-term
 - IT services: IT investments are advancing and expanding as companies have ever-increasing demand for digitalization. Rapid growth will continue in this area

Mid-term outlook for domestic production by industry



Note: Both figures for 2023 onwards are IRD forecasts
 Source: Both figured compiled by Mizuho Bank Industry Research Department based on various materials

Mid-term outlook for domestic demand

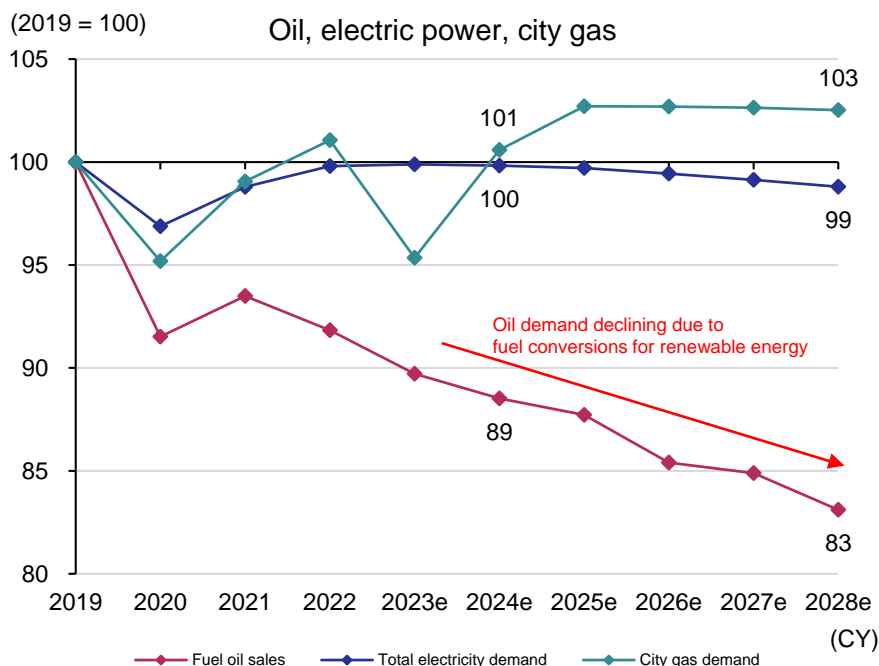


Note: The figures for 2023 onwards are IRD forecasts
 Source: Compiled by Mizuho Bank Industry Research Department based on various materials

Demand for oil weakening due to the shift to energy conservation and fuel conversion

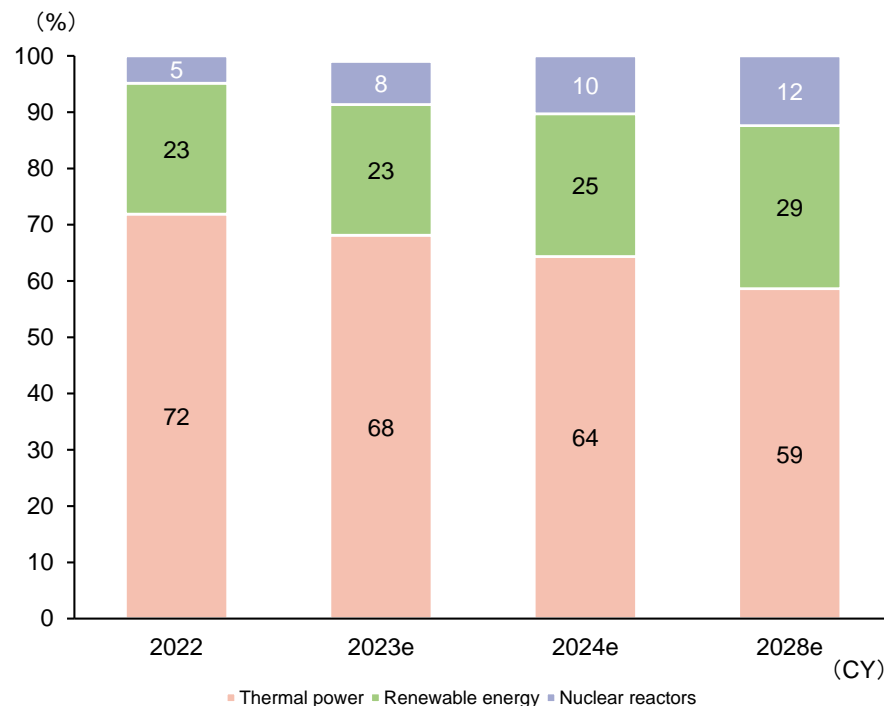
- Demand in the energy industry has been sluggish due to factors such as population decline, energy conservation, improvements in fuel efficiency, and fuel conversion
 - Oil: Demand is expected to decline due to trends such as improved fuel efficiency and fuel conversion
 - Electric power: Domestic demand is expected to decline moderately due to a slowdown in economic growth, fewer households, and progress in energy conservation
 - City gas: Overall domestic demand is expected to decline moderately through the latter half of the 2020s. While industrial demand is expected to increase due to the acquisition of demand for fuel conversion, demand for residential and commercial use will decline due to progress in energy conservation and electrification

Mid-term outlook for domestic demand by industry



Note: The figures for 2023 onwards are IRD forecasts
 Source: Compiled by Mizuho Bank Industry Research Department based on various materials

(Reference) Mid-term outlook of domestic power source structure (Based on quantity of power generation)

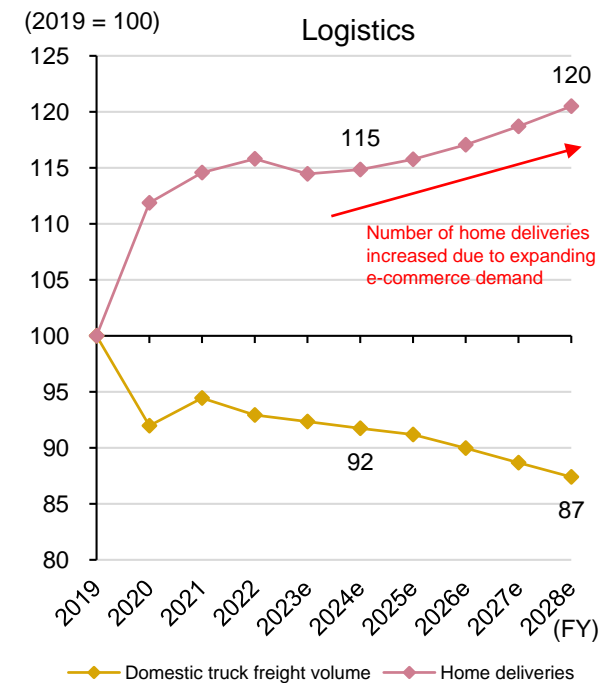
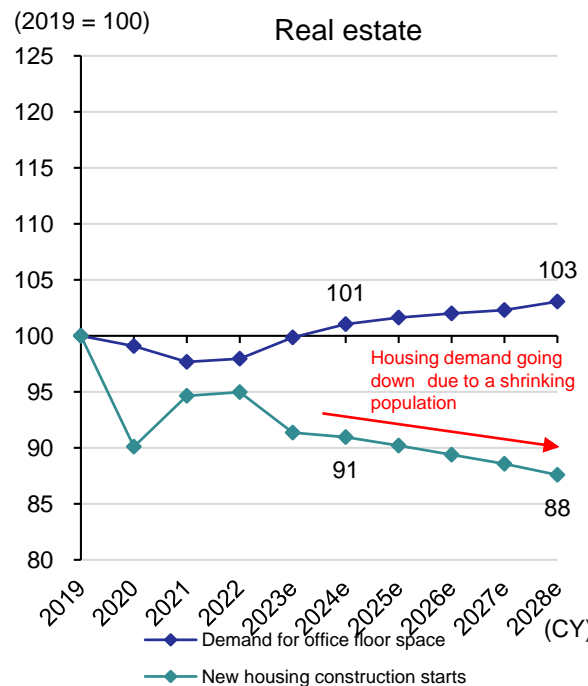
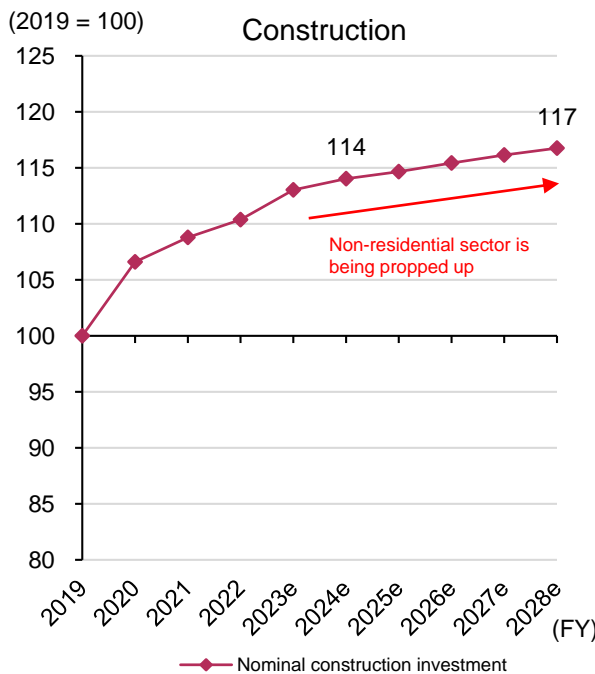


Note: The figures for 2022 are IRD estimations of actual results.
 The figures for 2023 onwards are IRD forecasts
 Source: Compiled by Mizuho Bank Industry Research Department based on various materials

Domestic demand for social infrastructure industry is facing intensified downward pressure as Japan's population shrinks

- Domestic demand for social infrastructure industry can expect intensified downward pressure as Japan's population shrinks
 - Construction investment (nominal): The private residential sector is slowly decreasing due to population decline. However, demand in the private non-residential sector is being supported by large-scale redevelopment projects and increased private-sector appetite for capital investment
 - Real estate: Demand for office space is slowly picking up thanks to economic recovery. However, housing demand has been sluggish due to a decrease in the number of households
 - Logistics (domestic truck freight volume): A decline is expected over the mid-term due to a declining population, sluggish consumer spending, and housing investment. However, the number of home deliveries (B2C) has grown steadily as e-commerce purchases have taken root among customers after accelerating over the pandemic

Mid-term outlook for domestic demand by industry



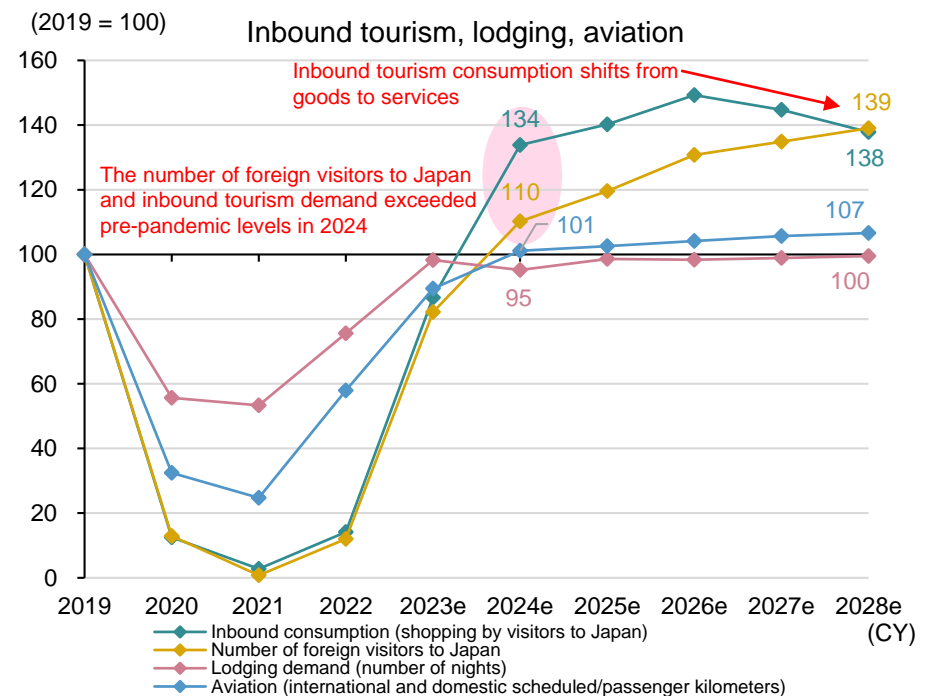
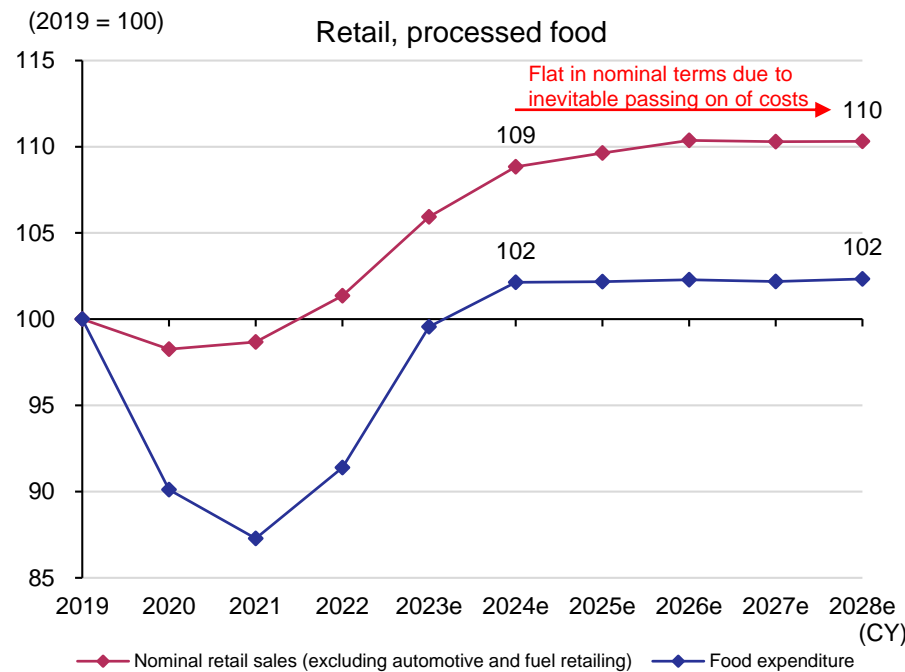
Note: All figures for 2023 onwards are IRD forecasts

Source: All figures compiled by Mizuho Bank Industry Research Department based on various materials

Lifestyle and service industries have recovered from the pandemic, but a structural slump in domestic demand is pushing it down

- The lifestyle and service industries were heavily affected by the pandemic, but they are improving as the economy returns to normal
 - Food expenditure and retail sales will be weak from 2025 onwards as both populations and number of households decline. As inflation continues, nominal values are expected to remain within a stable range
 - A steady growth in the number of foreign visitors to Japan is expected. However, foreign visitor shopping expenditures (in nominal terms), particularly for visitors from emerging countries, are expected to peak in 2026 and then gradually decline as foreign visitors shift from consuming goods to consuming services as their economies mature
 - Lodging and aviation will be supported by demand for inbound tourism, but will only recover moderately due to the shrinking population and less demand for business trips

Mid-term outlook for domestic demand by industry

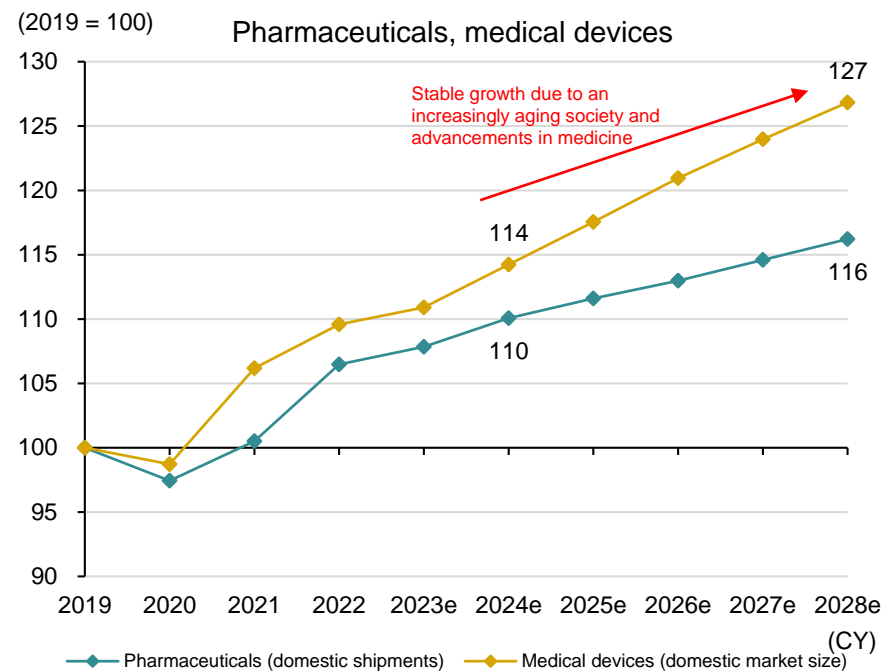
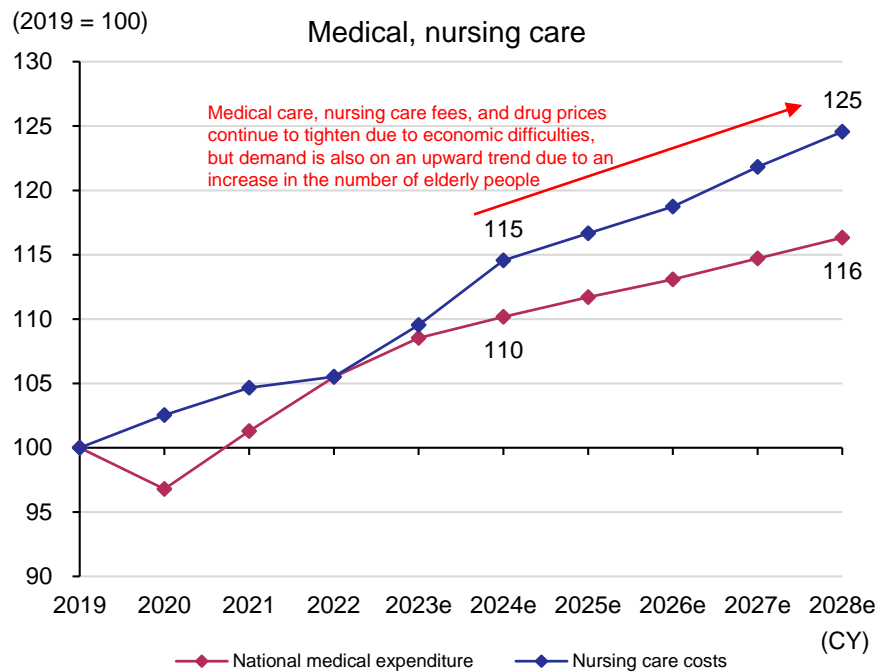


Note: Both figures for 2023 onwards are IRD forecasts
 Source: Both figures compiled by Mizuho Bank Industry Research Department based on various materials

Social security costs are increasing due to an aging society. Demand for pharmaceuticals and medical devices is also on the rise

- The healthcare industry is expected to steadily expand its market against the backdrop of an aging population and advancements in medical care
 - National medical and nursing care expenditures are projected to rise until 2028, driven by growing demand from an aging population and increased unit costs due to advancements in medical care. This will occur despite ongoing efforts to control fees for medical and nursing care as well as drug prices
 - Medical expenses for medical devices will see domestic demand for medical equipment steadily expand amidst growing demand for efficient medical care solutions, such as those that use AI. Domestic demand for pharmaceuticals is expected to increase in the mid-term driven by an increase in demand for pharmaceuticals, which is associated with an aging society and is also in response to drug lag and drug loss. This is despite policies controlling drug costs

Mid-term outlook for domestic demand by industry



Note: Both figures for 2023 onwards are IRD forecasts
 Source: Both figured compiled by Mizuho Bank Industry Research Department based on various materials

Changes in the business environment have transformed growth areas of Japanese industry

- In the mid-term, structural issues of Japanese industry will become more and more apparent due to changes in external factors and in the competitive environment
 - Adaptation to digitalization and manifestations of environmental value will become growth areas. Conventional areas with low-added values will shrink

Summary of changes in the business environment by industry

	Industrial segments	Changes in the business environment (External factors, supply and demand trends, competitive environment)	Expected areas of growth and contraction
1	Materials automotive	<ul style="list-style-type: none"> ■ Rise of China <ul style="list-style-type: none"> — Exports are sluggish due to the rise of China. Domestic production and capacity utilization are headed for severe levels (chemicals) — Exports are in decline due to China's shift to in-house smelting (non-ferrous metals). Export prices are deteriorating due to excess steel production in China (steel) — Market share of vehicles manufactured in China is set to expand as the shift to BEVs continues. Overseas sales channels will also expand (automotive) ■ Product and manufacturing processes are changing in the pursuit of decarbonization 	<div style="border: 2px solid blue; border-radius: 20px; padding: 10px; margin-bottom: 10px;"> <p style="text-align: center;">Growth area</p> <p style="text-align: center;"><u>Technology & environmental value</u></p> <p>(Potential topics)</p> <ul style="list-style-type: none"> ✓ BEVs and batteries ✓ Advanced semiconductors ✓ High-performance materials ✓ Spatial devices ✓ Contents ✓ IT consulting ✓ Inbound tourism ✓ Healthcare (SaMD) </div> <div style="border: 2px solid red; border-radius: 20px; padding: 10px;"> <p style="text-align: center;">Shrinking area</p> <p style="text-align: center;"><u>Conventional areas</u></p> <p>(Potential topics)</p> <ul style="list-style-type: none"> ✓ High CO2 emissions ✓ General-purpose products and materials ✓ Labor-intensive products </div>
2	Electronics, IT	<ul style="list-style-type: none"> ■ Markets will continually expand through technological advancements, such as digitalization and generative AI ■ Global competition will intensify driven by companies from different industries entering the market and the rise of Chinese and other emerging-country companies <ul style="list-style-type: none"> — The new area for demand in traditional equipment will soon be replaced due to advances in telecommunications and the spread of the Metaverse ■ Further disruptions to the supply chain will be driven by de-risking trends amidst heightened geopolitical risks 	
3	Energy	<ul style="list-style-type: none"> ■ Supply structure reforms will progress in the move towards decarbonization <ul style="list-style-type: none"> — As the new business environment is created, competition will intensify across industry bounds with all companies advocating for energy transitions ■ Competition for procurement will intensify as the energy supply and demand environment tightens against a backdrop of various geopolitical risks, such as the situation in Ukraine. Ability to procure will determine profitability 	
4	Lifestyle, society Infrastructure	<ul style="list-style-type: none"> ■ Competition among business categories will intensify amidst growing downward pressure driven by structural stagnation in domestic demand. Companies will be responding to accelerated digitalization over the pandemic by strengthening e-commerce ■ Consumer needs are diversifying to include health, convenience, and economical benefits after the pandemic ■ The labor shortage is becoming even more severe, particularly in construction and logistics, amidst Japan's shrinking population and other "2024 problems" 	
5	Healthcare	<ul style="list-style-type: none"> ■ Markets will continue to expand along with the aging society and the increasing advancements in medical care. However, public finances will continue to shrink driven by labor shortages due to fewer working-age people in the market and tightening labor regulations for physicians after FY2024 <ul style="list-style-type: none"> — The need for medical site optimization and advanced diagnoses and treatments will expand amidst labor shortages ■ In pharmaceuticals, venture companies will be increasingly present at the drug discovery stage 	

Source: Compiled by Mizuho Bank Industry Research Department

Structural challenges for Japanese industries

- The mid-term challenges facing the five industrial segments are regrouped into main structural challenges

Mid-term challenges derived from changes in the business environment

	Industrial segments	Mid-term challenges in each industrial segment
1	Materials automotive	<ul style="list-style-type: none"> ■ Addressing shrinking domestic demand and production (by optimizing supply capacity, etc.) ■ Overseas strategies based on the rise of China ■ Addressing changing trends, such as CN and the shift to BEVs
2	Electronics, IT	<ul style="list-style-type: none"> ■ Securing market share in new business areas through digitalization ■ China's technological catch-up is threatening to advance ■ Supply chain disruptions are causing procurement, manufacturing, and logistics inefficiencies
3	Energy	<ul style="list-style-type: none"> ■ Supply structure reforms will be required in the move towards decarbonization <ul style="list-style-type: none"> — Concerns over intensified competition and lower profitability in the shifted renewable energy industry — Need to secure funds for diversion ■ Ensuring stable supply and energy security <ul style="list-style-type: none"> — Need to strike a balance between stable procurement and profitability amidst concerns over a decline in demand for CN in the long-term
4	Lifestyle, society Infrastructure	<ul style="list-style-type: none"> ■ Domestic commuting and business trip demands are shrinking at a structural level in the aftermath of the COVID-19 pandemic. Meeting these evolving demands and delivering added value, such as environmental responsiveness, is essential. ■ The entire distribution structure is inefficient and segmented. Overall efficiency must be optimized. Mechanisms for collaboration and cooperation must be created with the aim of sustainable logistics and construction ■ Upward pressure on wages is increasing as Japan shifts to an inflationary trend, making it more difficult to secure workers
5	Healthcare	<ul style="list-style-type: none"> ■ Productivity must improve by utilizing technology and promoting DX in medical and nursing care sites amidst constraints such as tightening purse strings and labor shortages ■ The medical device market is expanding through the use of AI and other digital technologies, and there is an increasing demand for new drugs. Japanese companies may be slow to respond to this expanding market

Key mid-term challenges

Japanese industry and companies should secure their presence in growth areas created by digital transformation and decarbonization trends

Companies should maintain competitiveness in the face of structural declines in domestic demand, intensified competition from overseas, and changes in the demand structure

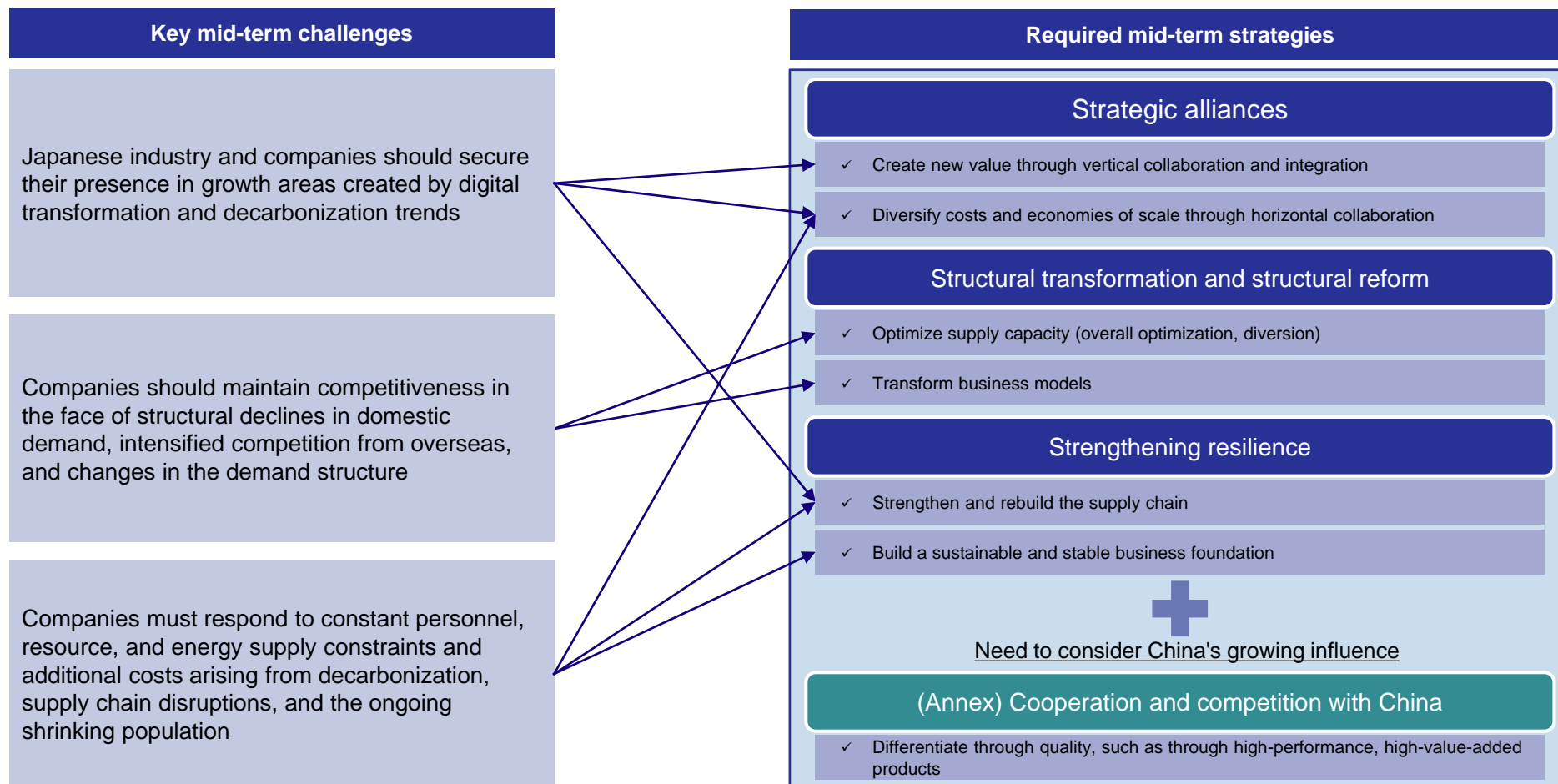
Companies must respond to constant personnel, resource, and energy supply constraints and additional costs arising from decarbonization, supply chain disruptions, and the ongoing shrinking population

Source: Compiled by Mizuho Bank Industry Research Department

Strategic alliances, structural changes, and enhanced resilience will be key for Japanese industry in the mid-term

- Japanese industries must form strategic alliances, apply structural reform, and enhance resilience over the mid-term

Strategies required of Japanese industry based on major mid-term challenges



Source: Compiled by Mizuho Bank Industry Research Department

Form strategic alliances to maintain competitiveness amidst increased competitiveness in growth areas and supply constraints

- The first mid-term strategy required of Japanese industry is to form strategic alliances in both offensive and defensive aspects
 - On the “offensive” side, industries must combine in different ways where they have not combined in the past regarding new business areas driven by digitalization and other such factors. Vertical collaboration and integration across layers will be required to increase presence in these new business areas
 - On the “defensive” side, horizontal alliances must be formed to maintain competitiveness. In the mid-term, supply chain disruptions caused by geopolitical risks and decarbonization efforts are expected to result in constant supply constraints in terms of labor, resources, energy, etc. This will require investments and additional costs that are not economically rational. Economies of scale must be secured through alliances within industry and costs must be diversified

Initiatives for vertical collaboration and integration

Industries	Mid-term initiatives
Electronics	<p><u>Spatial device integration</u></p> <ul style="list-style-type: none"> ■ “Wearables” are expected to be the next type of device after smartphones. Spatial devices may also fall under this banner. Such “spatial device integration” will manifest through combining in-house products and through making proposals and forming business and capital alliances that transcend layers
Media	<p><u>B2B collaboration for full-funnel marketing integration and enhanced use of generative AI</u></p> <ul style="list-style-type: none"> ■ Content will be enhanced through the integration of Media PFs, along with B2B deficiencies to implement full-funnel marketing integration and enhanced use of generative AI
Processed food	<p><u>Respond to diverse dietary needs by strengthening specialty areas</u></p> <ul style="list-style-type: none"> ■ “Diverse dietary needs” can include health, functionality, convenience, and environmental values, and there are limits as to what can be accomplished in-house when it comes to product differentiation. Product development capabilities must be strengthened through collaboration across categories and industries

Source: Compiled by Mizuho Bank Industry Research Department

Initiatives for horizontal collaboration

Industries	Mid-term initiatives
City gas	<p><u>Synergistic expansion by strengthening collaboration between large companies and SMEs</u></p> <ul style="list-style-type: none"> ■ Small and medium-sized companies to focus on capturing demand for fuel conversion, while large companies to procure LNG in a stable and economical manner. Both sides to enjoy the benefits
Construction	<p><u>Respond to environmental needs</u></p> <ul style="list-style-type: none"> ■ Labor shortages are an industry issue. Companies will need to collaborate on basic technologies that help to reduce CO2 emissions, and differentiate on additional technologies. Utilizing resources based on this understanding effectively will improve the added value of the industry as a whole
Lodging	<p><u>Industries must cooperate to resolve labor shortages, and must collaborate with and acquire other companies for inbound tourism demand</u></p> <ul style="list-style-type: none"> ■ Collaboration and corporate restructuring among businesses, including the formation of consortiums to secure and develop human resources ■ Demand from foreign visitors to Japan is expected to increase in the future. Local operators and players with customer bases must collaborate with and acquire other businesses to strengthen marketing

Source: Compiled by Mizuho Bank Industry Research Department

Structural change is required in light of the structural decline in domestic demand and major changes in trends such as CN and DX

- The second mid-term strategy required of Japanese industry is structural transformation and structural reform based on shrinking domestic demand and production, and changes in the demand structure amidst CN, DX, and other trends
 - The materials industry in particular must optimize supply capacity from the perspective of maintaining profitability amidst falling domestic demand. Overall optimization rather than individual optimization is key when it comes to maintaining competitiveness of the industry as a whole. One way to do this would be to divert supply capacity in light of the shift towards clean energy
 - Business models require radical change to break away from existing domains that are becoming legacy due to changes in demand structures, such as progress in DX, digitalization, and fuel conversion for CN

Initiatives to optimize supply capacity

Industries	Mid-term initiatives
Chemicals	<u>Strengthen competitiveness of industrial complexes</u> <ul style="list-style-type: none"> ■ For chemicals, corporate restructuring to focus on overall optimization of industrial complexes at a holistic level (such as vertically integrating ethylene plants with derivatives) rather than restructuring based on product-level optimization as chemical companies have done in the past
	<u>Old refinery sites to be converted into high-value-added facilities</u> <ul style="list-style-type: none"> ■ Former oil refinery sites may be converted from traditional oil storage facilities to high-value-added clean energy manufacturing sites, such as power plants, storage batteries, and SAF/RD manufacturing sites

Initiatives to transform the business model

Industries	Mid-term initiatives
IT services	<u>Move from traditional labor-intensive businesses to capital-intensive businesses</u> <ul style="list-style-type: none"> ■ Pursue added value through a consulting-based approach, and switch from labor-intensive businesses to capital-intensive businesses by developing service-oriented businesses that utilize cutting-edge technology and transforming into technology vendors
Oil	<u>SS to go from gas stations to places of consumption</u> <ul style="list-style-type: none"> ■ In light of the shrinking demand for gasoline-powered vehicles, service stations should become more than just “a place to receive a service.” They should become “places people want to visit” by offering enhanced consumption opportunities, such as brands and spatial experiences

Note 1: SAF = Sustainable Aviation Fuel

Note 2: RD = Renewable Diesel

Source: Compiled by Mizuho Bank Industry Research Department

Note: SS = Service Station

Source: Compiled by Mizuho Bank Industry Research Department

Need to strengthen resilience against constant supply constraints

- The third mid-term strategy required of Japanese industry is to strengthen resilience in preparation for increasing uncertainty in the future, changes in the discontinuous competitive environment, and constant supply constraints
 - Amidst the evolving dynamics of CN and potential geopolitical risks, upstream resource procurement must be efficiently diversified and supply systems restructured to capture new demands. Enhanced coordination from the upstream to the downstream in the supply chain will be crucial for efficiency
 - In particular, sustainable and stable business foundations must be established to prepare for constant supply constraints in domestic demand-oriented industries that are susceptible to population decline. Therefore, DX must be promoted, technologies must be used to increase efficiency, and new revenue sources must be secured

Initiatives to strengthen and rebuild the supply chain

Industries	Mid-term initiatives
Steel	<p><u>Diversify reduced iron and high-grade scrap procurement</u></p> <ul style="list-style-type: none"> ■ A supply chain for reduced iron to be established, and the procurement network for high-grade scrap in the manufacture of high-grade steel for electric furnaces to be expanded in order to capture new demand in response to electrification, etc.
Non-ferrous metals	<p><u>Enhance e-scrap procurement</u></p> <ul style="list-style-type: none"> ■ Strengthen e-scrap procurement from major E-waste-generating countries, such as ASEAN and the United States, through initiatives like the acquisition of local recyclers ■ Further accelerate investment in growth areas by improving cash generation in the refining industry through promoting the use of E-scrap
Retail	<p><u>Strengthen supply chain management capabilities</u></p> <ul style="list-style-type: none"> ■ Strengthen competitive axes, such as the quantity and quality of customer contact points, product appeal, and cost competitiveness, by raising the level of in-house production operations, such as product development, logistics, and IT systems, and by linking production, distribution, and sales

Source: Compiled by Mizuho Bank Industry Research Department

Initiatives to build a sustainable and stable business foundation

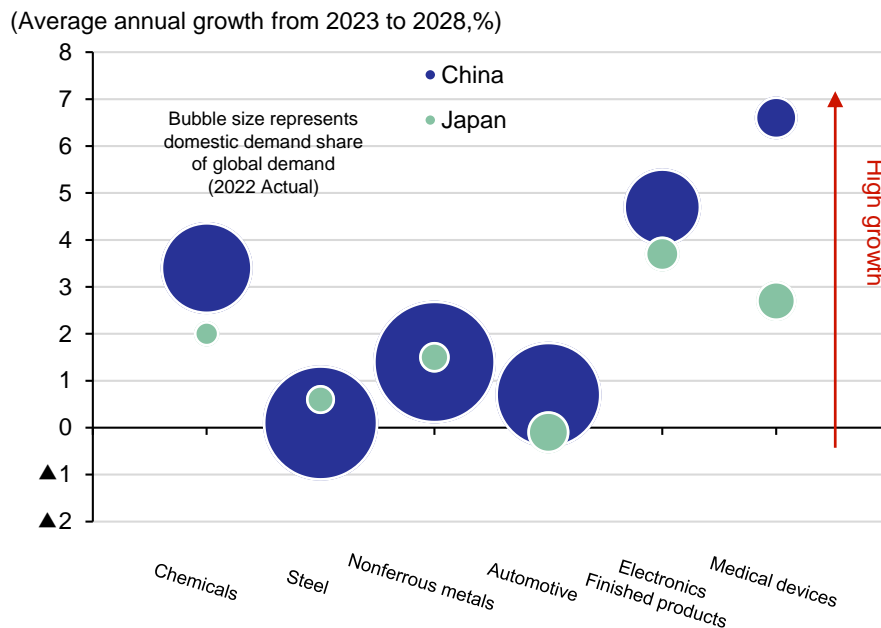
Industries	Mid-term initiatives
Logistics	<p><u>Standardize and collaborate with logistics by building a PI platform</u></p> <ul style="list-style-type: none"> ■ Aim for sustainable logistics and create a PI (Physical Internet) through standardizing transport units and opening up the logistics network
Retail	<p><u>Secure new profit opportunities by sourcing DX function productions in-house</u></p> <ul style="list-style-type: none"> ■ Expand new revenue sources through in-house development of organizational capabilities that strengthen digital customer contact points
Medical	<p><u>Promote functional enhancement as well as collaboration and DX</u></p> <ul style="list-style-type: none"> ■ Focus on the use of technology and promotion of DX in order to strengthen functions and improve productivity amidst financial and labor constraints
Nursing care	<p><u>Develop and use AI and adopt workplace DX for functional recovery care</u></p> <ul style="list-style-type: none"> ■ Amidst an expected shortage of human resources, major business operators with capital strength in particular to work towards a sustainable nursing care insurance system by shifting towards “functional recovery care” through on-site DX promotion with AI and infrastructure development

Source: Compiled by Mizuho Bank Industry Research Department

(Annex) Corporate initiatives in light of the rise of China

- China, with its overwhelming size, has a large share of global demand by industry and is expected to grow faster than Japan
- China is steadily increasing its global presence in various industries in a number of ways, such as through self-sufficiency, in-house production of materials, domestic production of medical devices, and expanding BEVs overseas, to name a few. Japanese industries must determine in which areas they will cooperate with China and in which areas they will compete as part of their future strategic directions
 - China has an overwhelming advantage in terms of volume. While the threat of technological catch-up in the future is present, one way to combat this could be for Japan to provide high-performance and high-value-added products that do not compete with Chinese companies

Growth of domestic demand by industry in China and Japan



Note 1: Average annual growth rate for 2023 to 2028 are IRD forecasts
 Note 2: Electronics (finished products) and medical device shares are calculated based on the average exchange rate in 2022
 Note 3: Refer to "List of Projected Values" for the indicators for each industry. Refer to each industry section for sources
 Source: Compiled by Mizuho Bank Industry Research Department based on various materials

Japanese industry initiatives for cooperation and competition with China

Industries	Mid-term initiatives
Steel	<p><u>Expand overseas production with Chinese manufacturers in mind</u></p> <ul style="list-style-type: none"> ■ Chinese manufacturers have an overwhelming advantage when it comes to volume. To ensure that these manufacturers do not overlap with region and quality, Japanese industries should take advantage of infrastructure demand in regions with growing population and industry, as well as the demand for high-grade steel in the shift to BEVs
Automotive	<p><u>Collaborate and enter into new transactions in the Thai and Indonesian markets amidst the shift to BEVs</u></p> <ul style="list-style-type: none"> ■ Thailand and Indonesia are expected potential demand areas when it comes to BEVs. Consider collaborating and entering into new transactions with Chinese companies with an early-expansion of the BEV lineup mindset
Medical devices	<p><u>Expand into the U.S. with high-value-added products</u></p> <ul style="list-style-type: none"> ■ The number of Chinese companies is increasing and competition is intensifying. Focus on the steadily growing U.S. market and strengthen sales structures and promote the added value of products by incorporating cutting-edge technologies
Semiconductors	<p><u>Business strategies when dealing with China based on China's policy shift towards domestic semiconductor production</u></p> <ul style="list-style-type: none"> ■ As domestic production of semiconductors advances in China, one option when pursuing profit opportunities in China is to collaborate with Chinese companies and to differentiate with high-value-added products

Source: Compiled by Mizuho Bank Industry Research Department

(Reference) Trends in Global Demand Indicators

		(2019=100)						
Industry	Indicator	2020 (Actual)	2021 (Actual)	2022 (Actual)	2023 (Estimate)	2024 (Projected)	2028 (Projected)	CAGR 2023-2028
Processed food	Processed food sales (retail channels)	104	106	108	110	112	120	1.7%
Chemicals	Ethylene equivalent demand	104	109	110	113	115	127	2.4%
Pharmaceuticals	Pharmaceutical sales	103	114	117	121	126	148	4.0%
Steel	Crude steel apparent consumption	100	103	100	102	103	110	1.5%
Non-ferrous metals	Electrolytic copper demand	103	104	108	109	110	117	1.4%
Medical devices	Global market size	98	112	117	122	127	152	4.5%
Automotive	Number of vehicles sold (Major countries/regions)	87	91	91	98	100	104	1.1%
	Number of vehicles sold (global)	86	91	90	97	99	104	1.3%
Electronics (semiconductors)	Semiconductor demand	111	141	146	131	141	179	6.4%
Electronics (electronic components)	Electronic components demand	100	115	109	98	106	123	4.8%
Electronics (finished products)	Demand for major electronics products	100	115	109	105	112	132	4.7%
Electric power	Electricity demand	101	106	111	112	114	122	1.7%
City gas	Natural gas demand (U.S., Europe, China, ASEAN)	98	102	101	102	103	103	0.2%
Telecommunications	Number of lines	103	112	124	139	151	179	5.2%
	ARPU	94	93	85	79	75	70	▲2.5%
	ARPU x number of lines	97	104	105	109	113	125	2.6%
Media services	Advertising expenses	97	110	122	125	133	159	4.8%
IT services	Investment in IT services/software	108	121	140	153	169	259	11.1%
Logistics	Shipping (major liner lading: Americas/Europe/Asia)	99	107	103	100	102	111	2.2%
Aviation	Scheduled transport/passenger kilometers	34	42	69	94	106	132	7.0%
Retail	Retail sales revenue	102	112	118	124	130	157	4.7%

Note: Given the discontinuity of data due to the change in the definition at the source, only electronics (finished products) are listed as 2020 = 100
Source: Compiled by Mizuho Bank Industry Research Department based on various materials

(Reference) Trends in Domestic Demand Indicators

Industry	Indicator						(2019=100)	CAGR 2023-2028
		2020 (Actual)	2021 (Actual)	2022 (Actual)	2023 (Estimate)	2024 (Projected)	2028 (Projected)	
Processed food	Food expenditure	90	87	91	100	102	102	0.6%
Chemicals	Ethylene equivalent demand	88	99	93	85	91	94	2.0%
Pharmaceuticals	Domestic pharmaceutical shipments	97	101	106	108	110	116	1.5%
Oil	Oil demand	92	93	92	90	89	83	▲1.5%
Steel	Crude steel apparent consumption	79	93	86	86	88	89	0.6%
Non-ferrous metals	Electrolytic copper demand	88	90	90	84	87	90	1.5%
Medical devices	Domestic market size	99	106	110	111	114	127	2.7%
Electronics (semiconductors)	Semiconductor demand	97	132	201	198	207	249	4.7%
Electronics (electronic components)	Electronic components demand	89	84	66	62	65	73	3.4%
Electronics (finished products)	Demand for major electronics products	98	104	115	109	114	131	3.7%
Automotive	Number of vehicles sold	89	86	81	91	92	90	▲0.1%
Construction	Nominal construction investment (fiscal year)	107	109	110	113	114	117	0.7%
Electric power	Total electricity demand	97	99	100	100	100	99	▲0.2%
City gas	City gas demand	95	99	101	95	101	103	1.5%
Telecommunications	Telecommunications (ARPU)	96	92	90	88	87	88	0.1%
	Number of mobile phone/PHS lines	103	106	106	106	107	109	0.5%
	ARPU x number of lines	99	98	95	93	93	96	0.6%
Media services	Domestic advertising expenses	89	98	102	102	103	106	0.8%
IT services	IT services sales revenue	112	125	133	142	152	202	7.3%
Logistics	Domestic truck freight volume (fiscal year)	92	94	93	92	92	87	▲1.1%
	Number of home deliveries (annual)	112	115	116	114	115	120	1.0%
Aviation	International and domestic scheduled/passenger kilometers	32	25	58	89	101	107	3.6%
Retail	Retail sales (excluding automobile and fuel retailing)	98	99	101	106	109	110	0.8%
	Inbound consumption/shopping by visitors to Japan	12	3	14	87	134	138	9.7%
Real estate	Demand for office floor space	99	98	98	100	101	103	0.6%
	New housing construction starts	90	95	95	91	91	88	▲0.8%
Lodging	Number of foreign tourists visiting Japan	13	1	12	82	110	139	11.1%
	Lodging demand (number of nights)	56	53	76	98	95	100	0.3%
Medical	National medical expenditure	97	101	105	109	110	116	1.4%
Nursing care	Nursing care demand	103	105	106	110	115	125	2.6%

Source: Compiled by Mizuho Bank Industry Research Department based on various materials

(Reference) Trends in Export and Production Indicators**[Export Indicators]**

		(2019=100)						
Industry	Indicator	2020 (Actual)	2021 (Actual)	2022 (Actual)	2023 (Estimate)	2024 (Projected)	2028 (Projected)	CAGR 2023-2028
Processed food	Processed food exports	112	134	150	148	157	229	9.0%
Chemicals	Ethylene equivalent exports	100	97	75	83	78	75	▲1.9%
Pharmaceuticals	Pharmaceutical exports	114	117	156	163	161	188	2.9%
Oil	Petroleum product exports	63	65	84	77	76	67	▲2.8%
Steel	Crude steel equivalent steel imports/exports	93	102	96	94	94	83	▲2.4%
Non-ferrous metals	Copper ingot exports	141	113	121	120	116	95	▲4.5%
Medical devices	Medical device exports	95	108	126	154	157	170	2.0%
Electronics (semiconductors)	Semiconductor exports	100	118	139	126	133	155	4.1%
Electronics (electronic components)	Electronic component exports	99	119	134	120	130	152	4.9%
Electronics (finished products)	Exports of major electronic products	97	103	122	100	108	125	4.6%
Automotive	Number of vehicles exported	78	79	79	85	85	88	0.7%

[Production Indicators]

		(2019=100)						
Industry	Indicator	2020 (Actual)	2021 (Actual)	2022 (Actual)	2023 (Estimate)	2024 (Projected)	2028 (Projected)	CAGR 2023-2028
Processed food	Processed food production	98	99	104	106	109	109	0.5%
Chemicals	Ethylene equivalent production	92	99	85	83	85	86	0.6%
Pharmaceuticals	Production of pharmaceuticals for domestic use	98	97	105	107	105	109	0.5%
Oil	Petroleum product production	81	80	87	85	84	79	▲1.5%
Steel	Crude steel production	84	97	90	89	90	87	▲0.4%
Non-ferrous metals	Copper ingot production	106	101	104	98	98	93	▲0.9%
Medical devices	Domestic medical device production	94	101	100	104	106	111	1.4%
Electronics (semiconductors)	Semiconductor production	101	114	124	113	119	138	4.1%
Electronics (electronic components)	Electronic component production	99	112	111	99	105	114	2.9%
Electronics (finished products)	Production of major electronic products	86	85	89	84	87	99	3.4%
Automotive	Number of vehicles produced	83	81	81	87	88	89	0.3%

Source: Compiled by Mizuho Bank Industry Research Department based on various materials

2. Chemicals

Amid the Ongoing Adverse Demand-Supply Situation, Growth Strategies Strengthening Industrial Complex Competitiveness with a View to Carbon Neutrality are Necessary

I. Supply and Demand Trends		<p>(Short term)</p> <ul style="list-style-type: none"> Global: Demand was sluggish in 2022 due to the weakness of the Chinese economy etc., but has recovered to grow at a rate of about 2.5% per year Domestic: Flat trends are forecast due to the effects of sluggishness in essential industries and their slightly-delayed recovery <p>(Medium term)</p> <ul style="list-style-type: none"> Global: Although Chinese growth rates are anticipated to be on a declining trend, demand growth in emerging economies such as ASEAN nations and China is forecast to sustain growth at a rate of about 2.5% per year. By contrast, while developed economies are in positive growth territory, basically flat trends are forecast Domestic: Although improvement associated with recovery in essential industries such as automobiles and semiconductors is forecast, factors such as purchasing hesitancy due to the impact of rising consumer goods prices are anticipated to cause demand to be lower than 2019 (pre-pandemic) levels, depressing domestic demand
II. Topics	Competitive Environment	<ul style="list-style-type: none"> Globally, excess supply is anticipated to continue for the time being due to large-scale new and expanded facilities being built, notably in China. Looking ahead, China and Saudi Arabia have shown intent to continue actively investing, expanding the influence not only within China but throughout Asia Domestically, the business environment for commodity product exports will become increasingly adverse due to factors such as China's growing self-sufficiency. Ethylene plant operating rates will accordingly continue to decrease, necessitating consideration of production capacity optimization to maintain and increase competitiveness
	Risks and Opportunities	<p>(Risks)</p> <ul style="list-style-type: none"> There are, broadly, three approaches to the carbon neutrality transition for ethylene plants. In Japan, the conditions are adverse and the barriers are high for all of them. As there are many cases of withdrawing from derivatives, it is necessary to strengthen competitiveness across the entire industrial complex <p>(Opportunities)</p> <ul style="list-style-type: none"> National government support in the form of green transformation loans may be available. In addition to carbon neutrality action, demand-supply optimization and industrial competitiveness may also be requirements for support, meaning that - while receiving support - restructuring of a type more far-reaching than in the past may be progressed
	Analyst's View	<p>Strengthening industrial complex competitiveness</p> <ul style="list-style-type: none"> A realistic path forward is the vertical integration of ethylene plants and derivatives. Unlike past restructurings in which chemical companies have worked toward optimization on an individual product basis, this would demand a more holistic reorganization with a view to optimization of the entire industrial complex Selection and centralization of locations is necessary to avoid creating stranded assets from the perspective of carbon neutrality action as well. Drawing up growth strategies which look beyond 2050 now will make a strategic industrial transition possible Promoting strategies which retain a strong, sustainable chemicals industry within Japan will likely also result in increased competitiveness of individual companies

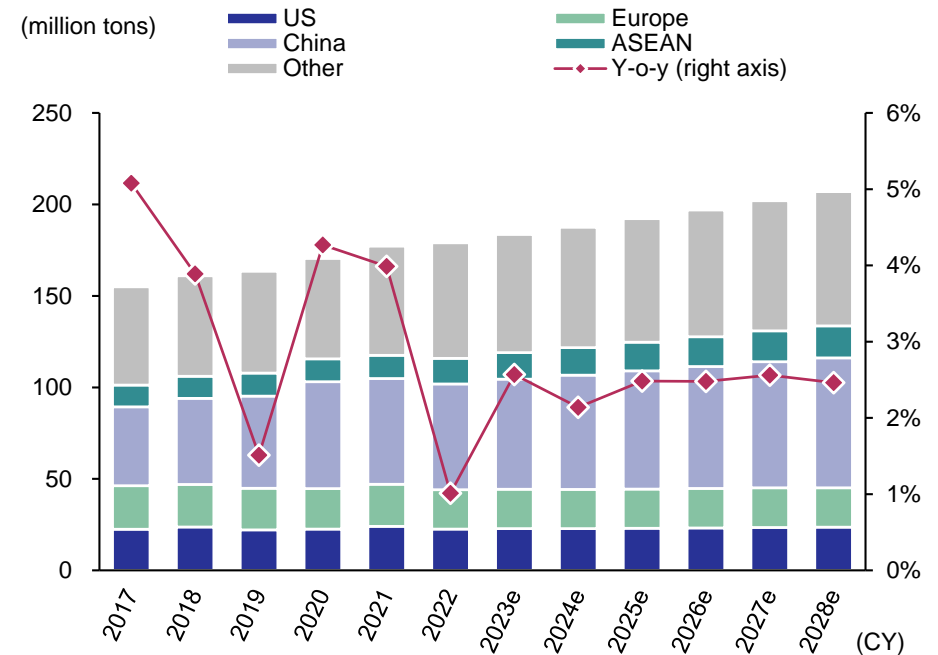
Source: Compiled by Mizuho Bank Industry Research Department

Global demand: Growth is forecast to continue at a rate of about 2.5% per year

- Global ethylene equivalent demand is expected to reach 184 million tons in 2023 (up y-o-y by 2.6%) and 188 million tons in 2024 (+2.1% y-o-y). In the medium term, annual growth of approximately 2.5% is expected, with global demand in 2028 forecast to amount to 207 million tons.
 - In the short term, growth is expected to recover to a rate of about 2.6% thanks to recovery in demand from China, which had slumped due to the weakness of the Chinese economy in 2022 etc.
 - In the medium term, although Chinese growth rates are anticipated to be on a declining trend, demand growth in emerging economies such as ASEAN nations and China is forecast to sustain a rate of about 2.5% per year. By contrast, while developed economies are in positive growth territory, basically flat trends are forecast except for in the US

Global ethylene equivalent demand trends by region

(thousand tons)	2022 (actual)	2023 (forecast)	2024 (projection)	2028 (projection)	CAGR 2023-2028
US	22,558	22,785	22,798	23,600	-
YoY	-6.2%	+1.0%	+0.1%	-	+0.7%
Europe	21,555	21,509	21,453	21,549	-
YoY	-6.1%	-0.2%	-0.3%	-	+0.0%
China	57,801	60,182	62,429	71,024	-
YoY	-0.1%	+4.1%	+3.7%	-	+3.4%
ASEAN	13,982	14,530	15,068	17,479	-
YoY	+10.0%	+3.9%	+3.7%	-	+3.8%
Global total	179,011	183,610	187,538	206,972	-
YoY	+1.0%	+2.6%	+2.1%	-	+2.4%



Note: FY 2023 values onwards in both figures are predictions by the Mizuho Bank Industry Research Department

Source: Both figures compiled by Mizuho Bank Industry Research Department based on various publicly-available data

Domestic demand: Although positive growth is sustained, levels are lower than before the pandemic

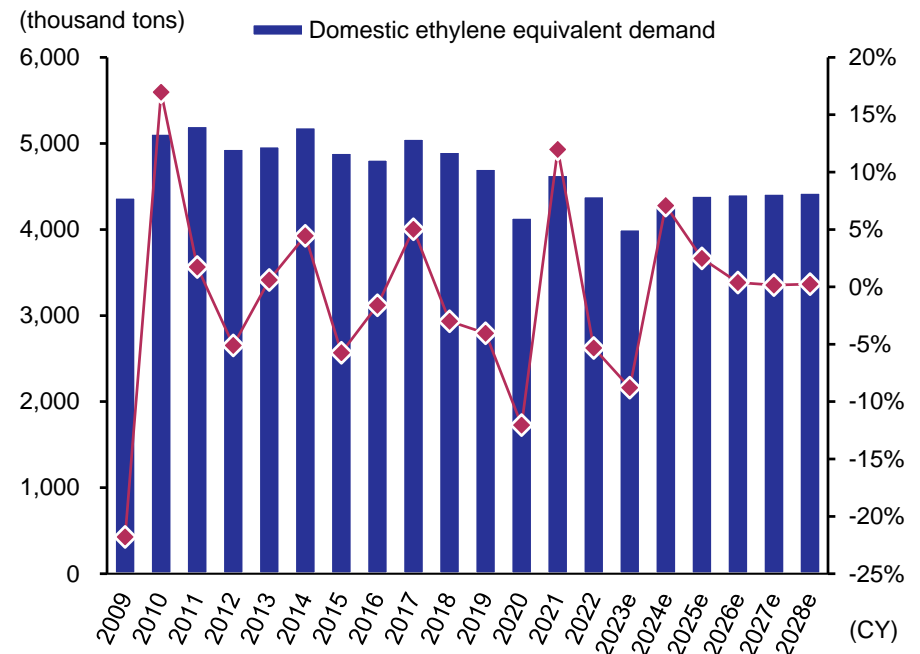
- Due to factors such as consolidation and weakness in essential industries, ethylene equivalent demand in Japan for 2023 is expected to drop significantly to 4,005 thousand tons (down y-o-y by 8.8%), but then show some recovery to 4,289 thousand tons in 2024 (up y-o-y 7.1%). In the medium term, although demand is anticipated to be lower than 2019 (pre-pandemic) levels, by maintaining some growth (while being basically flat) it is expected to reach 4,430 thousand tons in 2028
 - In the immediate future, despite the impact of flatness in essential industries such as automobiles and semiconductors, recovery is forecast in the short to medium term even though those essential industries are lagging slightly. By contrast, factors such as purchasing hesitancy due to the impact of rising consumer goods prices are anticipated to cause demand to be lower than 2019 (pre-pandemic) levels in the medium term as well, depressing domestic demand

Domestic ethylene equivalent demand trends

(thousand tons)	2022 (actual)	2023 (forecast)	2024 (projection)	2028 (projection)	CAGR 2023–2028
Domestic demand	4,390	4,005	4,289	4,430	–
YoY	–5.3%	–8.8%	+7.1%	–	+2.0%
Exports	1,873	2,082	1,950	1,893	–
YoY	–23.2%	+11.2%	–6.3%	–	–1.9%
Imports	814	743	795	821	–
YoY	+12.2%	–8.8%	+7.1%	–	+2.0%
Domestic production	5,449	5,344	5,444	5,501	–
YoY	–14.2%	–1.9%	+1.9%	–	+0.6%
Facilities operating rate	85%	79%	82%	83%	–

Note: 2023 values onwards are predictions by the Mizuho Bank Industry Research Department
 Source: Compiled by Mizuho Bank Industry Research Department based on The Heavy & Chemical Industries News Agency and other materials

Medium-term outlook for domestic ethylene equivalent demand

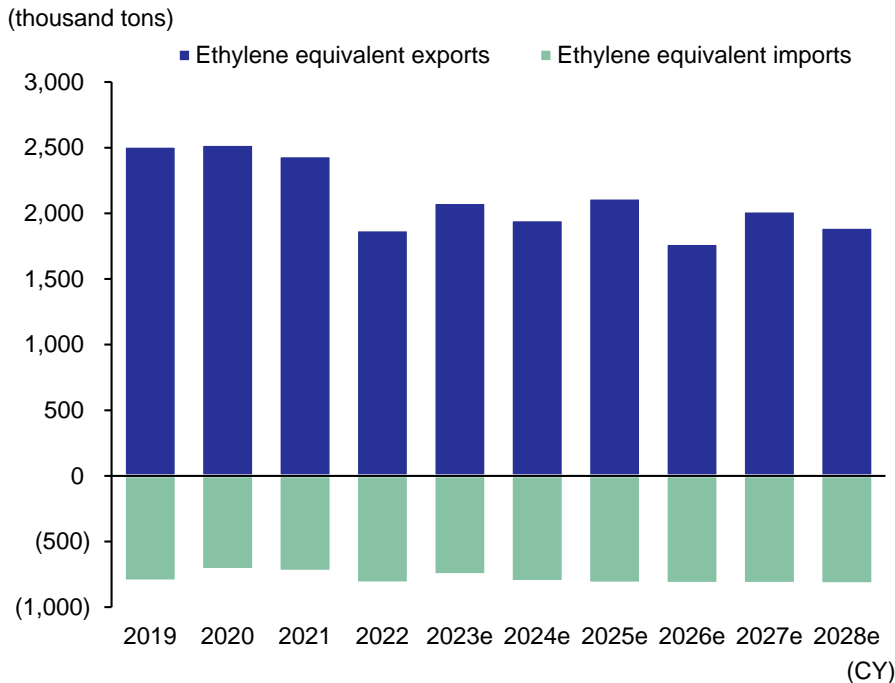


Note: 2023 values onwards are predictions by the Mizuho Bank Industry Research Department
 Source: Compiled by Mizuho Bank Industry Research Department based on The Heavy & Chemical Industries News Agency and other materials

Import/export and production: Exports - principally commodity products - are forecast to decrease

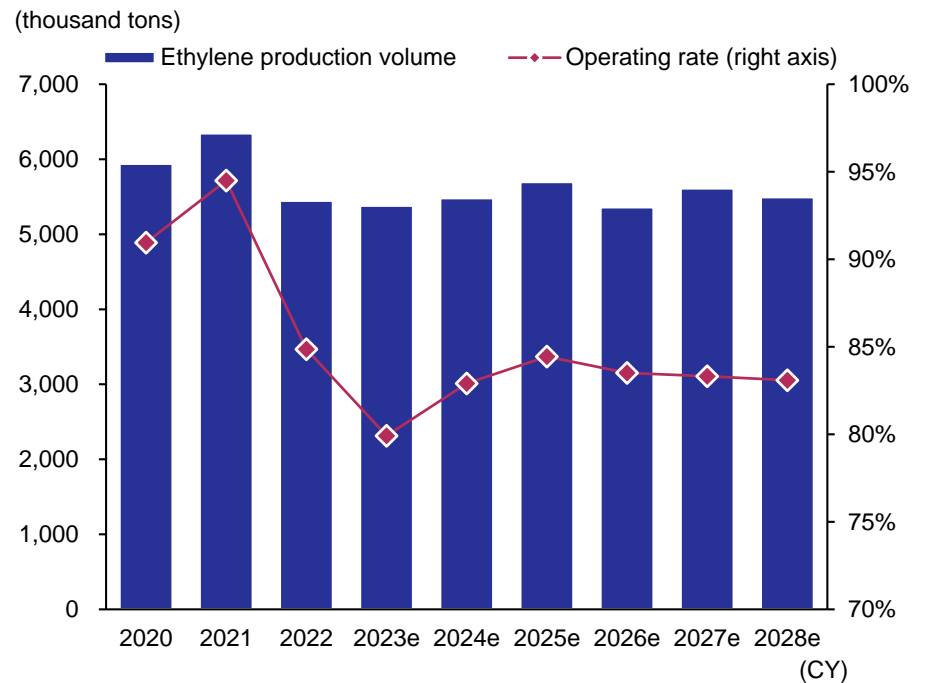
- Ethylene equivalent exports are expected to be 2,082 thousand tons in 2023 (up 11.2% y-o-y), 1,950 thousand tons in 2024 (down 6.3% y-o-y), and 1,893 thousand tons in 2028 (down 1.9% p.a.). Imports of the same are expected to reach 820 thousand tons in 2028 (+1.8% p.a.).
 - As excess global supply continues, the demand and supply situation is unlikely to improve. Ethylene equivalent exports are expected to drop below around the 2,000 thousand tons per year level. In particular, exports of commodity products and ethylene itself are forecast to decrease due to China’s growing self-sufficiency
- Domestic production (operating rate) is forecast to be 5,344 thousand tons (79.3%) in 2023, 5,444 thousand tons (82.3%) in 2024, and 5,501 thousand tons (83.2%) in 2028.
 - As a result of the drop-off in domestic demand and export scale, operating rates significantly below the break-even level of 90% are projected to continue

Import/export medium-term forecast



Note: 2023 values onwards are predictions by the Mizuho Bank Industry Research Department
 Source: Compiled by Mizuho Bank Industry Research Department based on The Heavy & Chemical Industries News Agency and other materials

Domestic production medium-term forecast

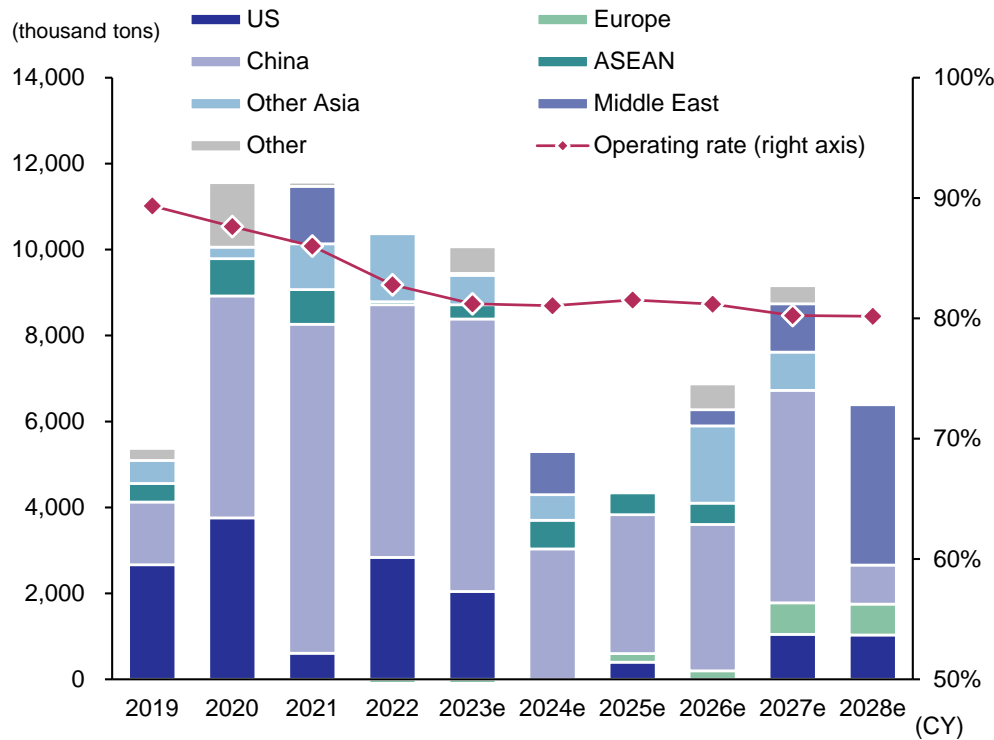


Note: 2023 values onwards are predictions by the Mizuho Bank Industry Research Department
 Source: Compiled by Mizuho Bank Industry Research Department based on The Heavy & Chemical Industries News Agency and other materials

The adverse demand-supply situation continues even with new and expanded facilities decreasing

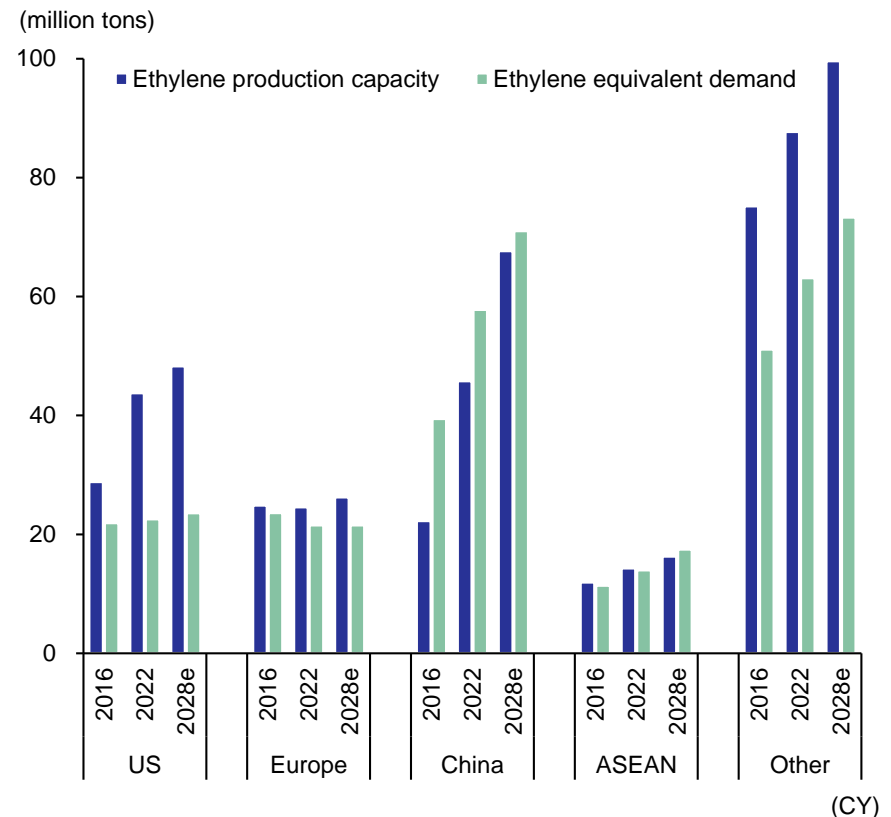
- While the amount of new and expanded facilities in 2024 and 2025 will be relatively small, demand growth will be about the same, so the adverse demand-supply situation is forecast to continue
 - Large-scale investment is projected to continue, particularly with large new and expanded facilities in China, but also in the rest of Asia and beyond
- The demand-supply gap by region is expected to close due to China's growing self-sufficiency, possibly leading to deteriorating operating rates in highly export-dependent facilities

Global outlook for ethylene new build/expansion plans



Note 1: Does not include coal-based products. Expected operating rates are calculated by demand/production capacity
 Note 2: 2023 values onwards are predictions by the Mizuho Bank Industry Research Department
 Source: Compiled by Mizuho Bank Industry Research Department based on various publicly-available data

Forecast trends in the demand-supply gap by region

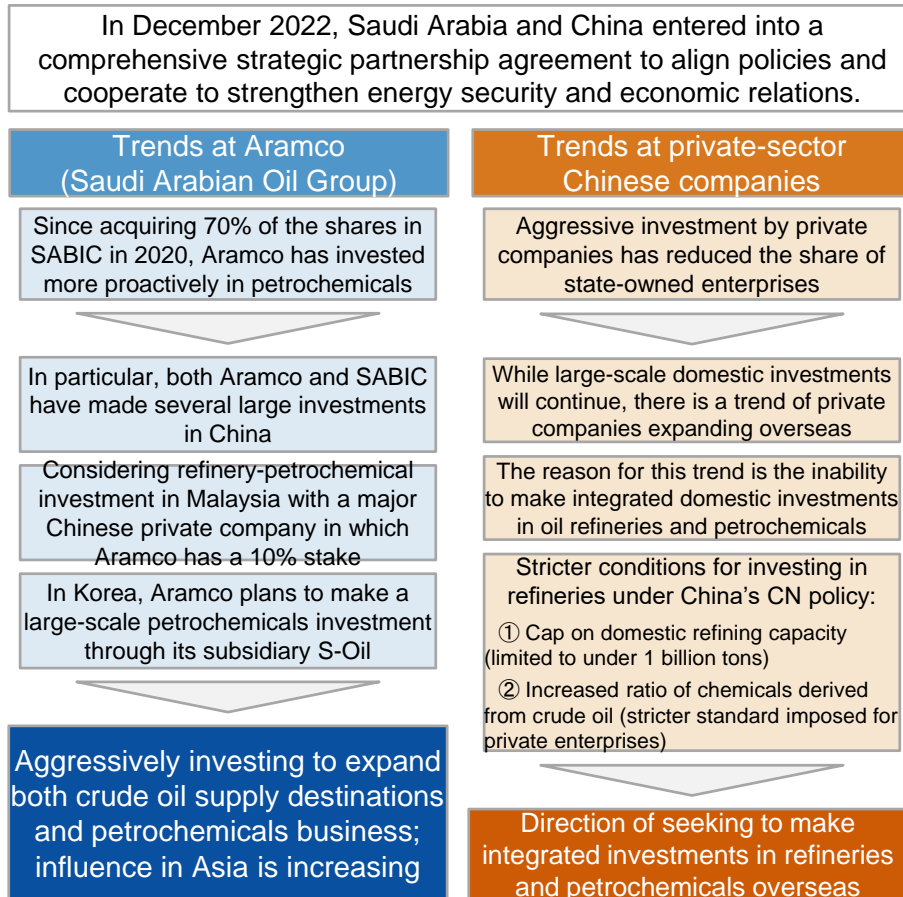


Source: Compiled by Mizuho Bank Industry Research Department based on various publicly-available data

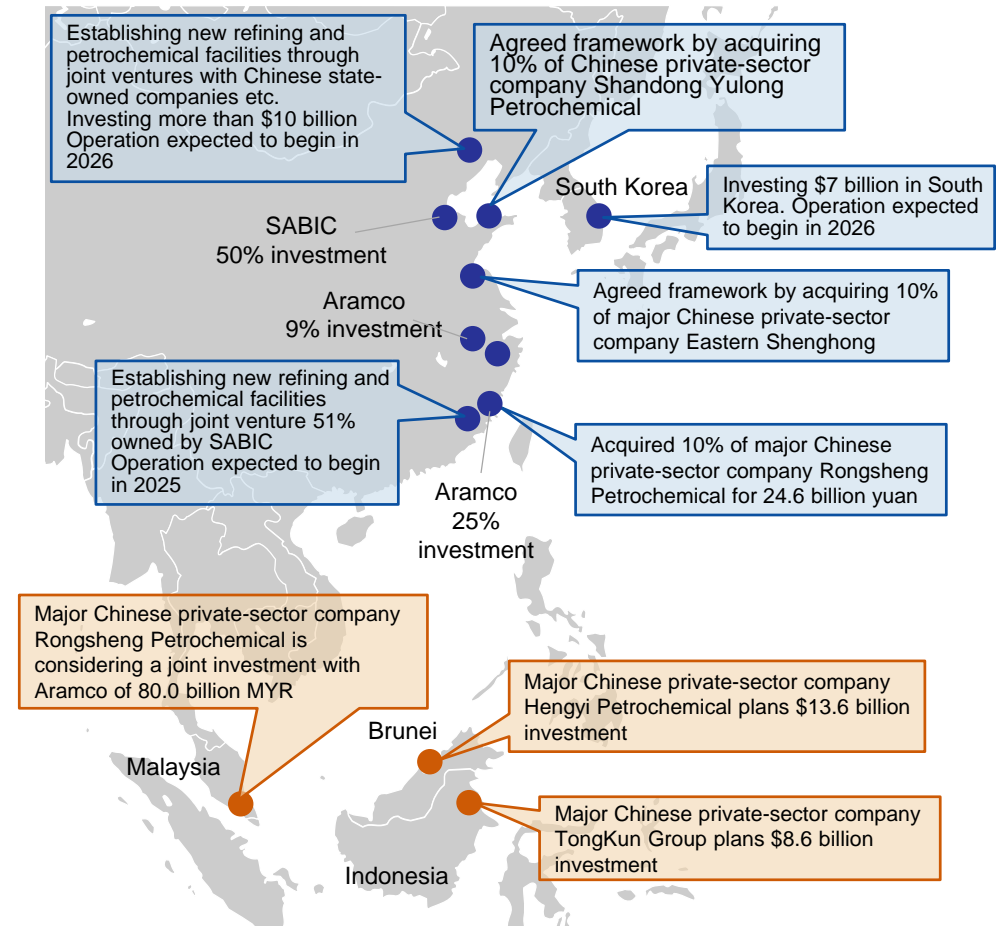
New investment moves made by Saudi Arabia and China: Growing influence in Asia

- In December 2022, Saudi Arabia and China signed a comprehensive strategic agreement. Since then, Aramco has been more actively making large investments
 - As well as Aramco strengthening its influence in China and the rest of Asia, this also means Chinese private-sector companies making large investments across Asia

Investment trends by Saudi Aramco and Chinese companies



Investment by Saudi Aramco and Chinese private-sector companies

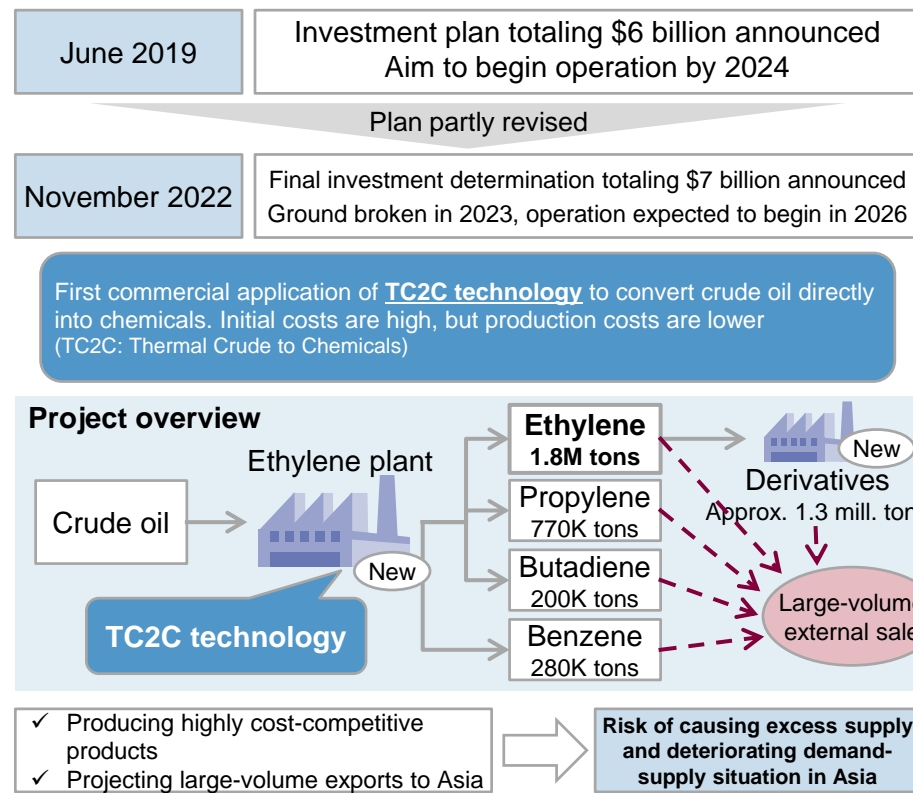


Source: Both figures compiled by Mizuho Bank Industry Research Department based on various publicly-available materials

Large-scale active investments overseas geared towards exports will continue to drive decreasing operating rates domestically

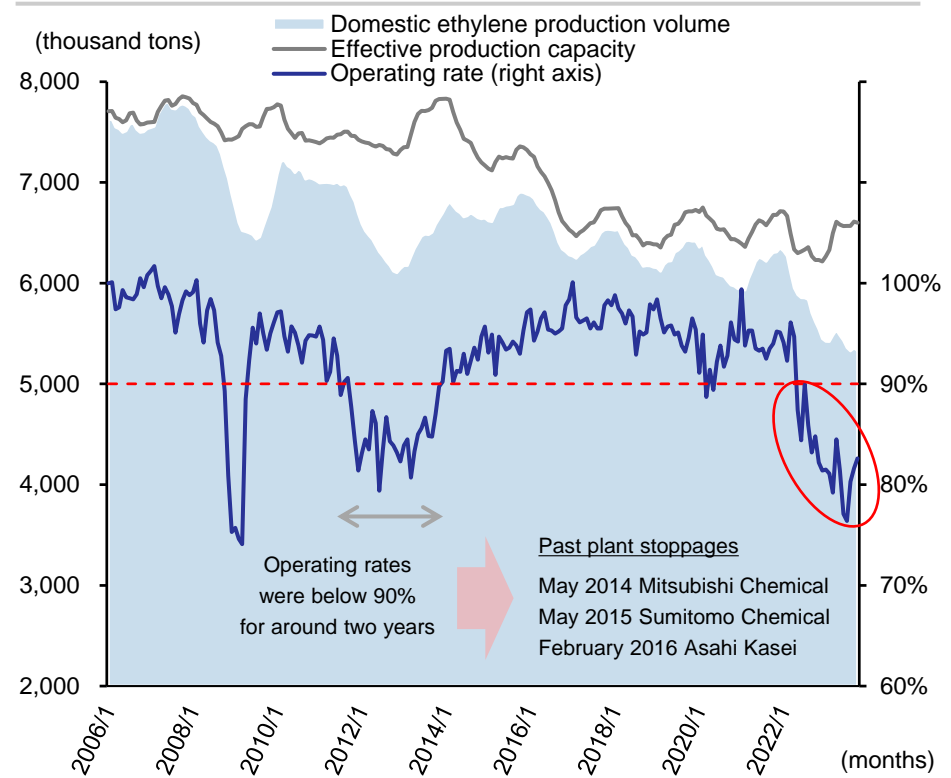
- Further large-scale investments are planned overseas, with Aramco (through its subsidiary S-Oil) deciding to make the largest-ever planned investment in South Korea
 - Greater exports from highly cost-competitive ethylene plants overseas would cause Japanese exports to fall
- As at October 2023 (the most recent data point), domestic ethylene plant operating rates have been below the 90% break-even estimate mark for 15 consecutive months
 - A certain amount of recovery is expected, but - with a view to domestic demand and exports decreasing in the future - consideration including of production capacity optimization has become necessary

World's largest-scale integrated refinery and ethylene plant which Aramco is advancing in South Korea



Source: Compiled by Mizuho Bank Industry Research Department based on Aramco IR materials, various publicly-available data, etc.

Trends in domestic ethylene production and operating rates

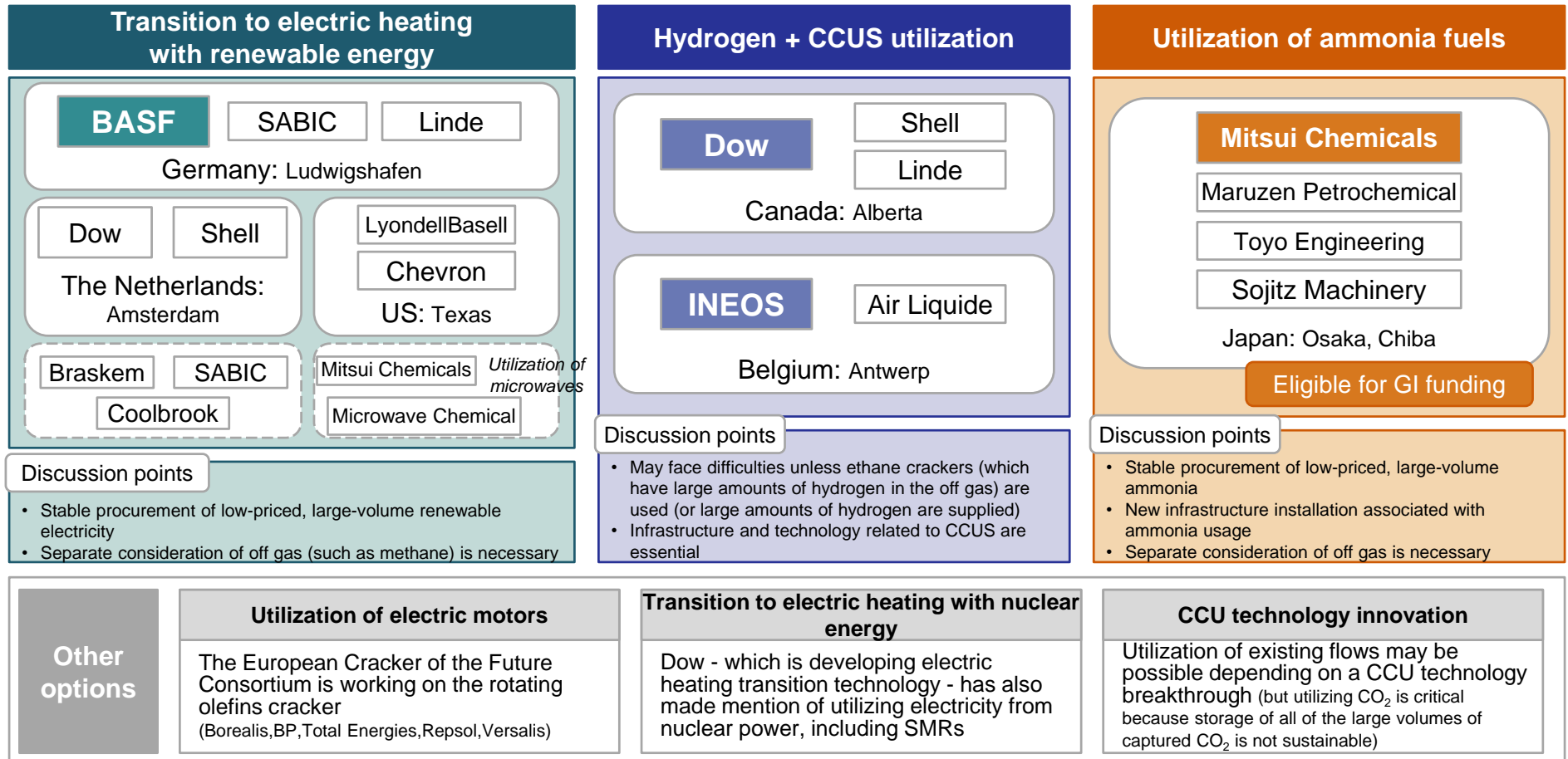


Note: The effective production capacity is calculated from the production volume and the operating rate
Source: Compiled by Mizuho Bank Industry Research Department based on "Petrochemical News" by The Heavy & Chemical Industries News Agency and other materials

The need for investment including for carbon neutrality action is a key discussion point

- Strategic investment geared toward future carbon neutrality action is essential from the perspective of optimizing ethylene plant production capacity over time
 - Within the three broad approaches to the carbon neutrality transition, the critical question is how to establish a business model while receiving strategic government support

Direction of carbon neutrality action for ethylene plants



Source: Compiled by Mizuho Bank Industry Research Department based on various materials

Strategic government support will help accelerate the carbon neutrality transition

- The policy direction of green transformation loan support emphasizes not only emissions reduction toward carbon neutrality but also contributing to industrial competitiveness and economic growth
- Measures which include demand-supply optimization - a pressing issue for the chemicals industry - have been listed as a particular requirement, therefore encouraging transition
 - As well as benefiting from economic rationality in current carbon neutrality action via strategic government support, this approach presents an opportunity for bold industry reorganization to increase industrial competitiveness

Direction of “investment promotion policies” in green transformation loans

Basic conditions

1. Businesses which first and foremost must be committed to fundamental management change and which are genuinely struggling to justify the investment required with private-sector funding only
2. Support is provided based on the order of priority (driven by the necessity of green transformation etc.) to initiatives which contribute to both strengthened industrial competitiveness and emissions reduction
3. Measures consistent with regulations and systems which lead to corporate investment and demand-related initiatives
4. Covers initiatives which lead to greater domestic investment in people and equipment (initiatives only overseas or for credit are not eligible for support)

Strengthening industrial competitiveness, economic growth

Growth investment with technological innovation, business innovation, and a view to capturing external demand and expanding domestic demand

Growth investment which contributes to both greenhouse gas reductions and improving profitability (comprehensively, via reorganization, etc.) through advanced technology

Domestic demand measures at the early implementation stage (including the supply side) for these key commodities with nationwide-scale markets anticipated

Patterns

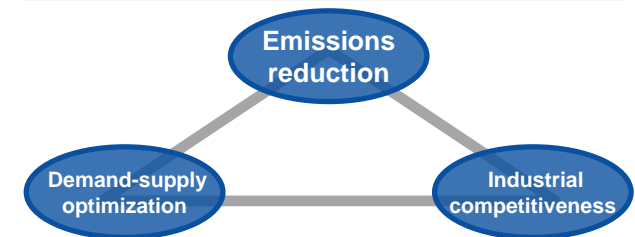
Emissions reduction

Research and development which contributes to future domestic reductions through technological innovation

Investment in plant and equipment which directly contributes to domestic emissions reductions through high technological reductions effect, etc.

Domestic demand measures at the early implementation stage for key commodities with high long-term reductions benefits

Directionality of green transformation support in the chemicals sector



Conditions other than carbon neutrality also need to be met

Industrial competitiveness

Manufacturing high added value chemical products with international competitiveness

Emissions reduction

Fuel source change
Changing the heat sources of naphtha steam cracker furnaces and the fuel sources of coal-fired systems to hydrogen, ammonia, etc.

Feedstock change
Changing from naphtha-derived feedstock to waste plastic, biomass, etc.

Support is focused on projects which form the “foundations of structural change” by promoting decarbonization while also working on the rebuilding into optimal industrial complexes based on decreasing domestic demand

Source: Both figures compiled by Mizuho Bank Industry Research Department based on Ministry of Economy, Trade and Industry materials, etc.

The necessity of strengthening industrial complex competitiveness through reorganization

- Even when limited to 2020 or later, there are many examples of Japanese companies withdrawing from derivatives production due to deteriorating market conditions or aging equipment
- Derivatives geared toward exports tend to be particularly affected by market conditions, causing concerns about the decay of domestic industries if the current trends continue

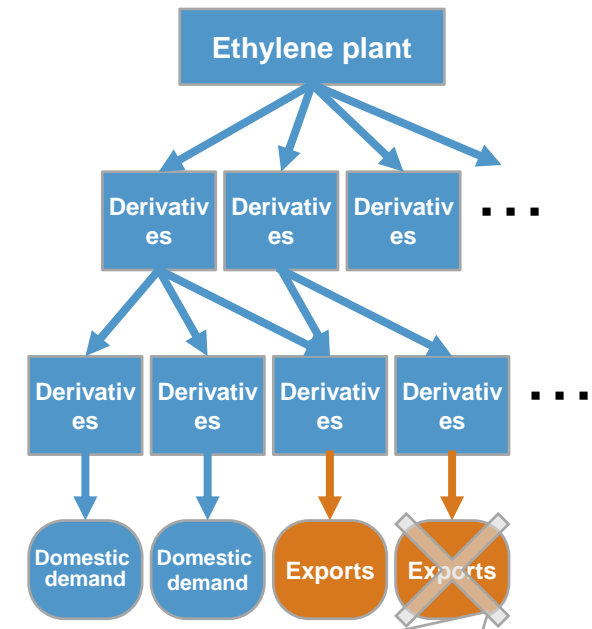
Analyst's view

Cases of domestic withdrawal from derivatives since 2020 (selection)

Companies	Locations	Products	Annual production capacity	Stoppage period	Notes
Taiyo Vinyl	Osaka	Vinyl chloride	158,000 tons	June 2020	Consolidation to Yokkaichi and Chiba as main domestic markets are in greater Tokyo
Japan Polypropylene	Chiba	Polypropylene	70,000 tons	Jan. 2021	Consolidation due to deteriorating market conditions aging equipment, etc.
Japan Polyethylene	Kashima	Polyethylene	62,000 tons	May 2021	Consolidation due to deteriorating market conditions etc.
Maruzen Petrochemical	Chiba	Ethylene oxide	115,000 tons	May 2022	Consolidation due to deteriorating market conditions etc.
Sumitomo Chemical	Chiba	EPDM	40,000 tons	Mar. 2023	Withdrawal from business due to aging equipment, etc.
Prime Polymer	Chiba	Polypropylene	110,000 tons	Mar. 2023	New equipment for annual production of 200,000 tons planned to begin operation in November 2024 (scrap and rebuild style)
Mitsubishi Chemical	Hiroshima	Acrylic fibers	18,000 tons	Mar. 2023	Withdrawal from business
Taiyo Oil	Ube	Styrene monomers	370,000 tons	Mar. 2023	Withdrawal from business due to deteriorating market conditions etc.
Tosoh	Shunan	TDI	25,000 tons	Apr. 2023	Withdrawal from business due to deteriorating market conditions etc. Plans to focus on MDI business
Mitsui Chemicals	Iwakuni Otake	PTA	400,000 tons	Aug. 2023	Withdrawal from domestic production, purchase and sale from Thai group company
Mitsubishi Gas Chemical	Yokkaichi	POM	20,000 tons	Sep 2023	Switched over to products made in Thailand due to equipment scale and aging
Japan Polypropylene	Yokkaichi	Polypropylene	80,000 tons	Mar. 2024	Consolidation due to deteriorating market conditions, equipment scale, etc.
Idemitsu Kosan	Chiba	Bisphenol A	81,000 tons	Oct. 2024	Withdrawal from business due to deteriorating market conditions etc.

Source: Both figures compiled by Mizuho Bank Industry Research Department based on The Heavy & Chemical Industries News Agency and other materials

Necessity of strengthening industrial competitiveness through reorganization



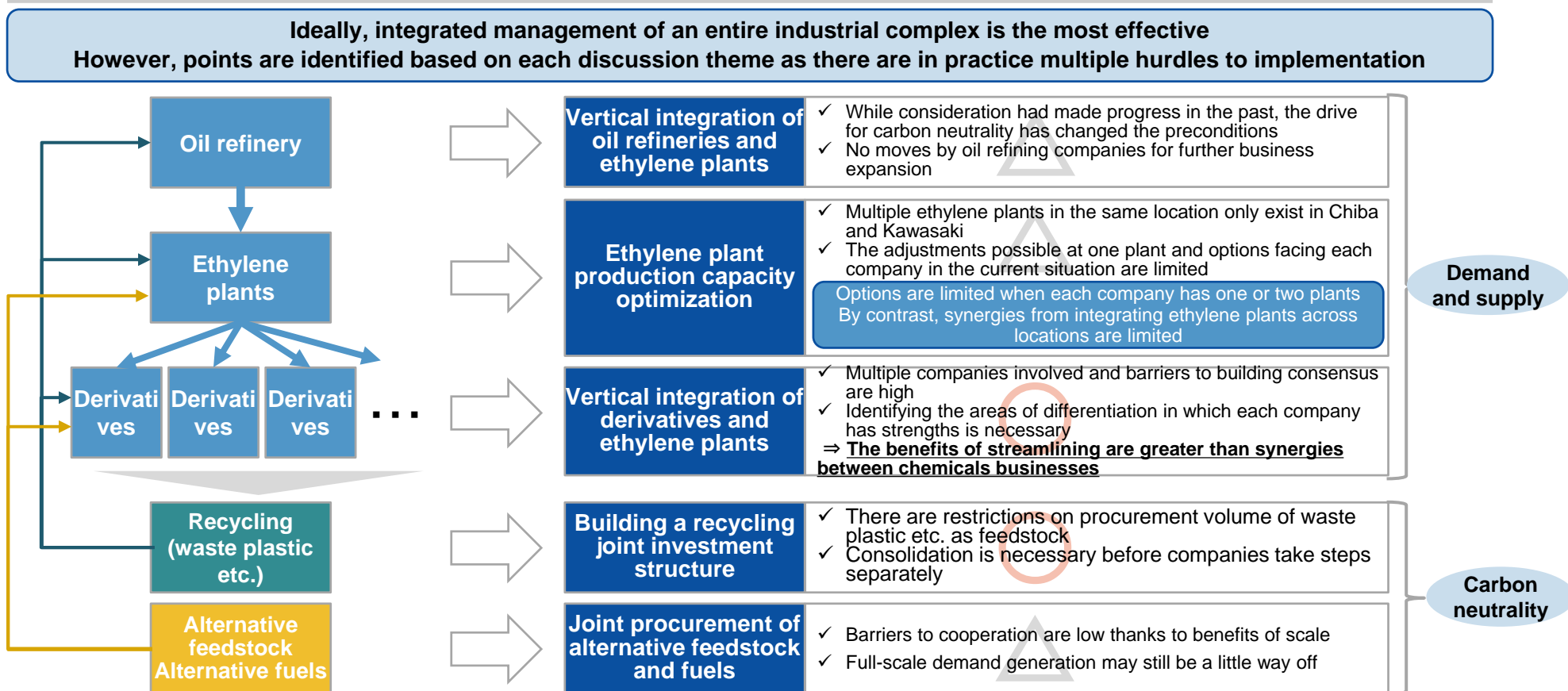
Highly export-dependent companies may struggle to keep their businesses running due to China's growing self-sufficiency etc.

A company continuing to withdraw from individual lines of business may even lead to concerns about the ongoing viability of the industrial complex
This demonstrates the necessity of increasing industrial complex competitiveness

Discussion points toward strengthening petrochemical industrial complex competitiveness

- Five broad discussion points can be identified toward overall optimization of industrial complexes. The following two are important for immediate actions
 - Demand and supply: As operating rates continue to decrease, discussion taking vertical integration of derivatives and ethylene plants into account
 - Carbon neutrality: Consideration including joint undertakings regarding chemical recycling bearing in mind restrictions relating to feedstock procurement such as waste plastic

Identifying discussion points toward strengthening competitiveness (overall optimization) of industrial complexes centered around ethylene plants

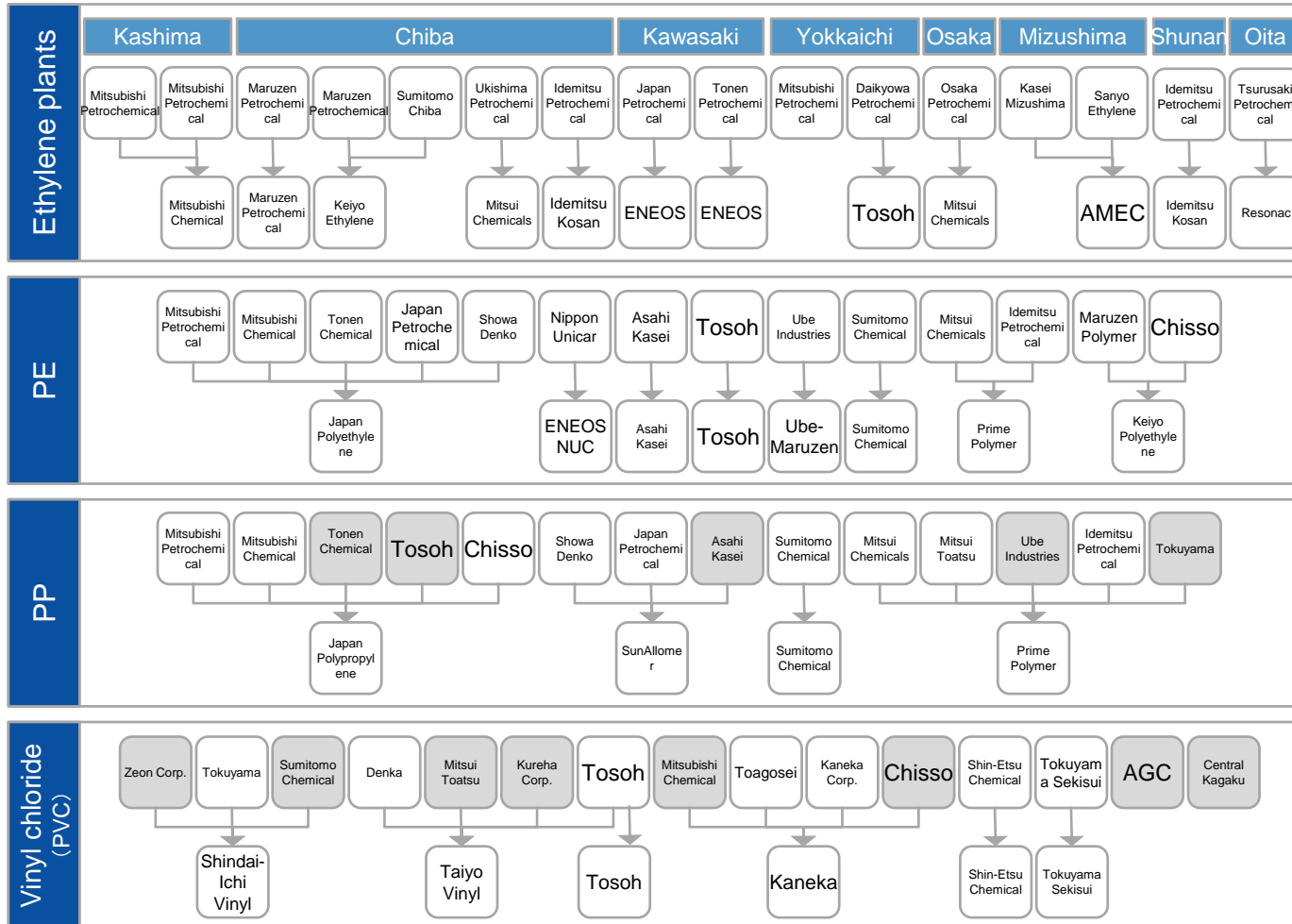


Source: Compiled by Mizuho Bank Industry Research Department

Strengthening the competitiveness of industrial complexes and individual companies by pursuing overall optimization rather than individual optimization is necessary

- The domestic petrochemical industry has been promoting industry reorganization more than in the past, but growth strategies based on strengthening competitiveness across the entire industrial complex are required

Changes due to reorganization in the domestic petrochemical industry over the past 30 years or so



Necessity of pursuing overall optimization

The petrochemical industry has to date promoted industry reorganization within a context of demand-supply adjustment, refocusing, downsizing, and withdrawal. However, the focus is on alignment between similar products. Production adjustment through individual optimization of various derivatives.

Failure to achieve overall optimization as industrial complexes may cause decreasing industrial competitiveness

- Creating complex capital relationships may hinder future vertical integration
- Further withdrawals may increase the burden on remaining companies

Industrial complexes should inherently be combined vehicles to maximize production efficiency, meaning that **integration within industrial complexes** is necessary

Ideally, **building a supply structure** which works toward overall optimization across not just one specific location but multiple locations within Japan would be preferable

Pursuing overall optimization will ultimately lead to strengthening the competitiveness of individual companies

Seeking a growth story geared toward the entire domestic petrochemical industry - beginning with the pressing issue of demand-supply optimization - is required

Source: Both figures compiled by Mizuho Bank Industry Research Department based on Japan Petrochemical Industry Association and other materials

3. Pharmaceuticals

Growing importance of building domestic drug discovery ecosystem for the Japanese market/companies

I. Supply and Demand Trends		<p>(Short-term)</p> <ul style="list-style-type: none"> Global: In 2024, forecast of recovery to pre-COVID-19-pandemic growth trends and market growth of +4.0% over the previous year Domestic: In 2024, despite predicted decline of some diagnostic drugs, forecast of market growth of +2.1% over the previous year due to high demand in oncology and launch of new dementia therapeutics <p>(Medium-term)</p> <ul style="list-style-type: none"> Global: Market growth of +4.0% until 2028 driven by the launches of new drugs in US and European markets. Growth driven not only by oncology but also immunology and diabetes markets. Domestic: Market growth of +1.5% until 2028 is forecasted due to increase in demand for pharmaceuticals driven by aging population and the launch of revolutionary drugs.
II. Topics	Competitive Environment	<ul style="list-style-type: none"> Of the top 100 global companies, 11 are Japanese, the second largest number after the US. However, Japanese companies lag far behind top US companies by sales volume, growth, and profitability. Start-ups have a growing presence at the drug discovery stage and US and European companies continue to grow by incorporating these start-ups.
	Risks and Opportunities	<p>(Risks)</p> <ul style="list-style-type: none"> Japanese global market share is forecasted to shrink, which could work against Japanese companies that have Japan as their home market. <p>(Opportunities)</p> <ul style="list-style-type: none"> Growth in the pharmaceutical market in specialty fields such as oncology/immunology as well as new modalities such as gene/cell therapy
	Analyst's View	<p>(Drug discovery ecosystem formation)</p> <ul style="list-style-type: none"> To increase domestic development of new drugs and strengthen the global presence of Japanese pharmaceutical companies, the strengthening of Japan's drug discovery capability is urgently needed. Japan Agency for Medical Research and Development's (AMED's) Strengthening Program for Pharmaceutical Startup Ecosystem, launched in 2022, aims to enhance drug discovery capability by subsidizing pharmaceutical startups that receive investment from registered venture capital firms. A report submitted to the Ministry of Health, Labour and Welfare Expert Panel on Comprehensive Measures to Achieve a Rapid and Stable Supply of Pharmaceuticals in June 2023 cited "strengthening drug discovery capability" as a key issue. Further expansion of support and systemic reforms are anticipated.

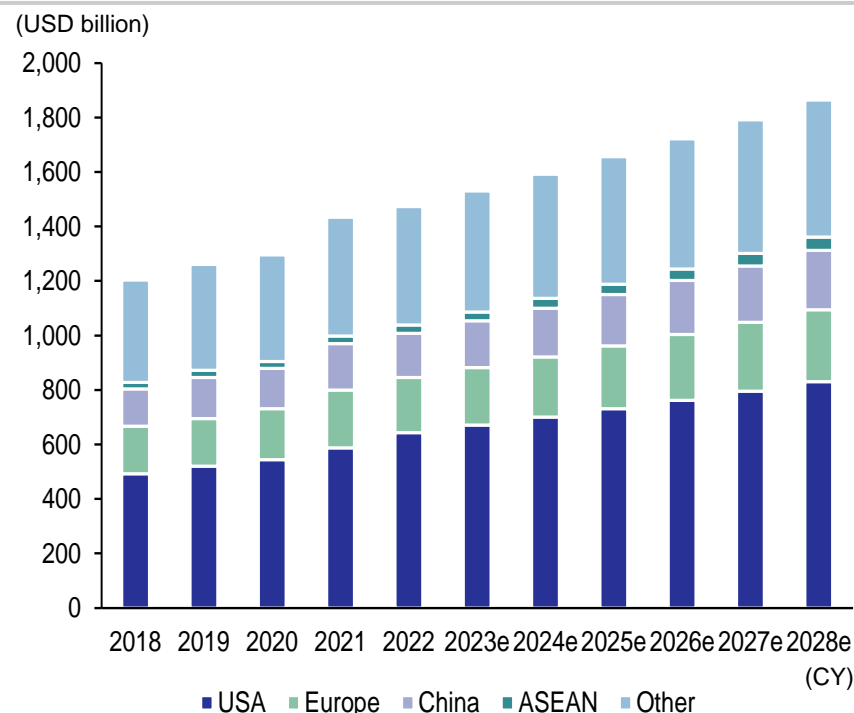
Source: Compiled by Mizuho Bank Industry Research Department.

[Global demand] Market forecasted to expand, primarily in the US and Europe

- In the short term, the pharmaceutical market is forecasted to see a recovery to pre-COVID-19-pandemic growth trends and market growth of +4.0% over the previous year.
- In the medium term, the launch of new drugs, first in the US and European markets, which account for nearly 60% of the global market, is expected to drive expansion of the overall global market.
 - In the Chinese market, an increase in generic pharmaceuticals and policies to keep down health care expenses are forecasted to slow the pace of growth compared to the past.

Medium-term global pharmaceutical market forecasts

(USD billion)	2022 (actual)	2023 (forecast)	2024 (forecast)	2028 (forecast)	CAGR 2023-2028
USA	643	671	700	831	-
Year-on-year	+9.3%	+4.4%	+4.4%	-	+4.4%
Europe	203	212	221	264	-
Year-on-year	+7.5%	+4.4%	+4.4%	-	+4.5%
China	163	171	179	218	-
Year-on-year	+0.0%	+5.0%	+5.0%	-	+5.0%
ASEAN	30	32	35	49	-
Year-on-year	+12.7%	+8.6%	+8.6%	-	+8.8%
Global total	1,473	1,531	1,592	1,864	-
Year-on-year	+2.7%	+4.0%	+4.0%	-	+4.0%



Note 1: In both figures, actual numbers (2018-2022) are cited from IQVIA. Figures for 2023 onwards are forecasts by the Mizuho Bank Industry Research Department.

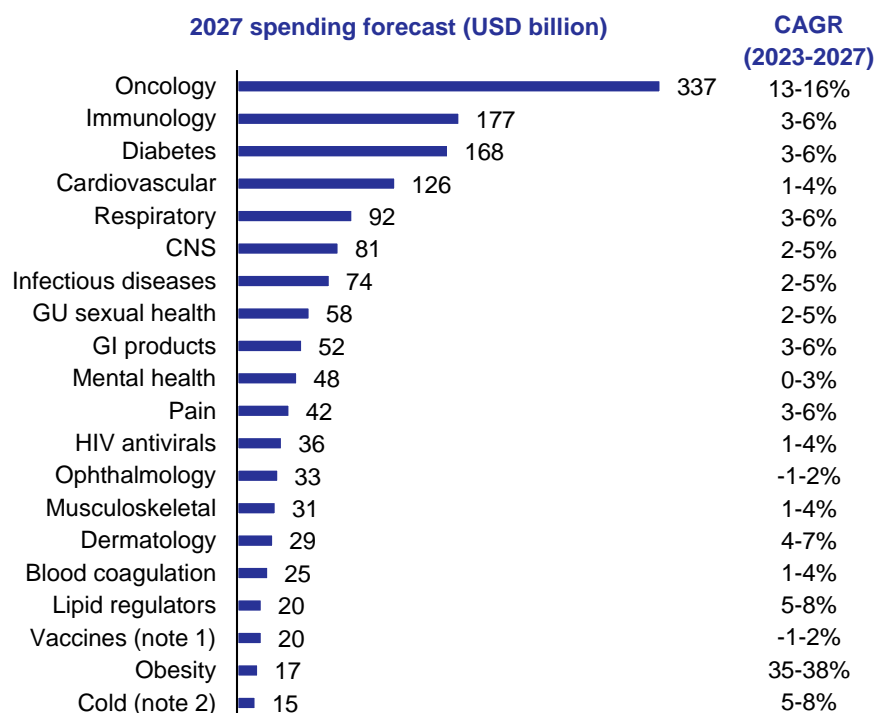
Note 2: In both figures, Europe refers to Germany, France, Italy, the UK, and Spain, while ASEAN refers to Indonesia, Thailand, Vietnam, the Philippines, Malaysia, and Singapore.

Source: Both figures have been compiled by Mizuho Bank Industry Research Department based on IQVIA World Review, Data Period – Year 2018-2022. (Copyright © 2023 IQVIA. Unauthorized reproduction is prohibited.)

[Global demand] Oncology, immunology, and diabetes drive market growth

- By disease type, the largest market is oncology, followed by immunology and diabetes. The market for oncology is expected to grow at a high rate until 2027.
- In the 2022 sales rankings by product, Humira ranked no. 1 as in the previous year. The top 15 products centered on diabetes (six) and immunology (four).
 - Oncology drugs account for only two of the top 15 products but there are numerous blockbusters (annual sales of USD 1 billion or more) from #16 on down.

Expected sales by disease type (2027)



Note 1: Does not include flu or COVID-19.

Note 2: Includes flu vaccines and antivirals.

Source: Compiled by Mizuho Bank Industry Research Department based on IQVIA Institute "Global Use of Medicine 2023 Outlook to 2027."

Global product sales rankings (2022)

	Product	Manufacturer	Sales (bil. USD)	Main indications
1	Humira	AbbVie	34,805	Rheumatoid arthritis, Crohn's disease
2	Eliquis	BMS ^(Note 1)	23,967	Venous thromboembolism, stroke
3	Keytruda	Merck & Co.	22,555	Cancer
4	Ozempic	Novo Nordisk	21,066	Type 2 diabetes
5	Stelara	J&J ^(Note 2)	17,679	Psoriasis, Crohn's disease
6	Trulicity	Eli Lilly	17,198	Type 2 diabetes
7	Jardiance	BI ^(Note 3)	13,933	Type 2 diabetes, chronic heart failure
8	Biktarvy	Gilead Sciences	13,263	HIV-1 infection
9	Xarelto	J&J / Bayer	12,797	Venous thromboembolism, stroke
10	Dupixent	Sanofi	9,982	Atopic dermatitis
11	Enbrel	Amgen	9,794	Rheumatoid arthritis
12	Opdivo	BMS	9,604	Cancer
13	Lantus	Sanofi	9,499	Diabetes
14	Farxiga	AstraZeneca	7,933	Diabetes, chronic heart failure
15	Januvia	Merck & Co.	7,697	Type 2 diabetes

Note 1: Bristol Myers Squibb. Note 2: Johnson & Johnson. Note 3: Boehringer Ingelheim.

Source: Compiled by Mizuho Bank Industry Research Department based on IQVIA "TOP 20 GLOBAL PRODUCTS 2022"

[Domestic shipments] Medium-term increase forecasted due chiefly to aging population and launch of revolutionary new drugs

- Domestic shipment value is expected to increase due to increased demand for COVID-19 diagnostic drugs and vaccines.
- In 2024, despite the predicted decline of some diagnostic drugs, the domestic shipment value is forecasted to grow by +2.1% over the previous year due to high demand in oncology and launch of new dementia therapeutics.
- In the medium term, although annual drug price revisions tend to limit drug expenditures, the impacts of increased drug demand driven by the aging population and the launch of revolutionary pharmaceuticals are expected to surpass the above trend, and domestic shipment value is forecasted to increase +1.5% annually.

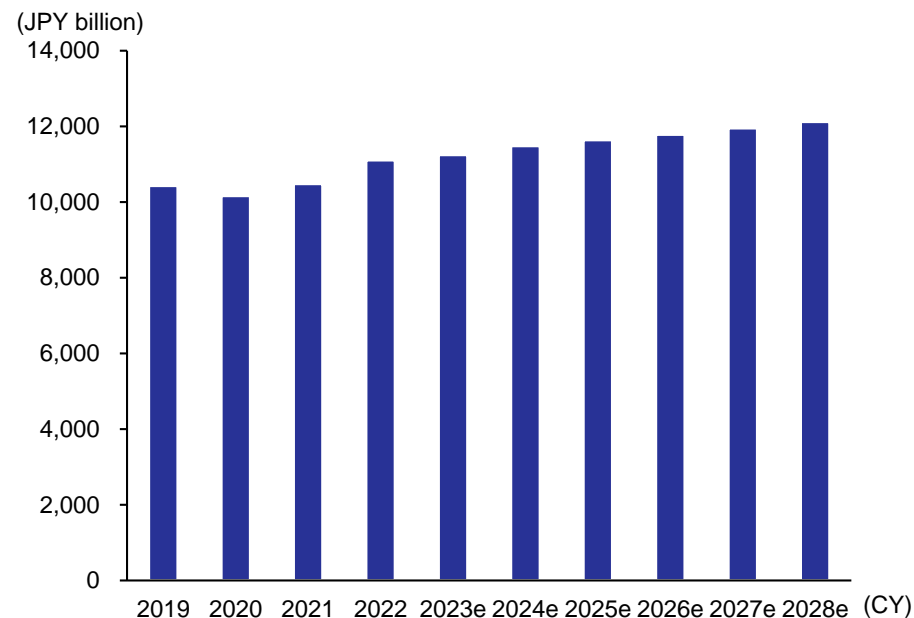
Domestic supply and demand trends

(JPY billion)	2022 (actual)	2023 (expected)	2024 (forecast)	2028 (forecast)	CAGR 2023-2028
Domestic shipments	11,106	11,248	11,481	12,122	-
Year-on-year	+5.9%	+1.3%	+2.1%	-	+1.5%
Exports	1,143	1,196	1,177	1,381	-
Year-on-year	+32.7%	+4.7%	-1.6%	-	+2.9%
Imports	5,737	5,029	4,320	4,986	-
Year-on-year	+36.3%	-12.4%	-14.1%	-	-0.2%
Domestic production	9,112	9,226	9,090	9,447	-
Year-on-year	+8.1%	+1.3%	-1.5%	-	+0.5%

Note: Domestic shipments and domestic production for 2022 estimated based on MHLW "Statistics of Production by Pharmaceutical Industry" (monthly report). Figures for 2023 onwards are forecasts by Mizuho Bank Industry Research Department. Exports and imports for 2022 are actual figures from Ministry of Finance "Trade Statistics of Japan." Figures for 2023 onwards are forecasts by Mizuho Bank Industry Research Department.

Source: Compiled by Mizuho Bank Industry Research Department based on MHLW "Statistics of Production by Pharmaceutical Industry" and Ministry of Finance "Trade Statistics of Japan."

Medium-term forecasts for domestic pharmaceutical shipment value



Note: Figures for 2019-2021 are estimated based on Statistics of Production by Pharmaceutical Industry annual reports, figures for 2022 are estimated based on monthly reports, and figures for 2023 onwards are forecasts by Mizuho Bank Industry Research Department.

Source: Compiled by Mizuho Bank Industry Research Department based on MHLW "Statistics of Production by Pharmaceutical Industry."

[Domestic demand] Government to limit drug expenditures with annual drug price revisions

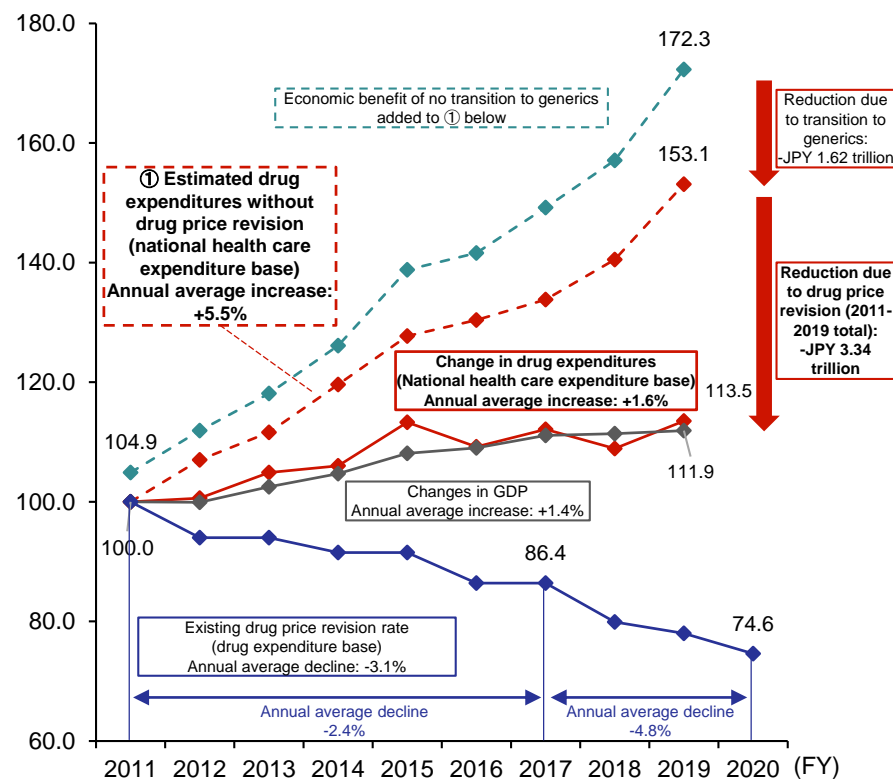
- With each drug price revision, drug expenditures fall roughly 4-8%.
 - Drug prices were previously revised every other year, but this changed to every year in FY2021.
- If the effect of drug price revisions is excluded, drug expenditures are estimated to have increased +5.5% annually (FY2011-2019). However, the actual increase in drug expenditures was +1.6% over the period.

Details of recent drug price revisions

FY	Revision rate/amount		Remarks
	Drug expenditure base	Health care expenditure base	
2018	-7.48%	-1.65%	Adjustable range: 2% (fixed rate reduction for original drugs for which transition to generics is not progressing) Of the revision rate, market price revision accounts for -1.36%, while radical reform of the drug pricing system accounts for -0.29% (health care expenditure base)
2019	-4.35%	-0.93%	Revision rate does not include considerations for consumption tax (drug expenditure base: +1.95%, health care expenditure base: +0.42%) Adjustable range: 2%
2020	-4.38%	-0.99%	Adjustable range: 2% (fixed rate reduction for original drugs for which transition to generic drugs is not progressing) Of the revision rate, market price revision accounts for -0.43%, while revision based on market growth recalculation accounts for -0.01% (health care expenditure base)
2021	-JPY 430 billion		For items exceeding the average discrepancy rate of 0.625 times (5%) Adjustable range: 2%, fixed range of 0.8% as an exception for COVID-19 infections
2022	-6.69%	-1.35%	Adjustable range: 2% (fixed rate reduction for original drugs for which transition to generic drugs is not progressing) Of the revision rate, market price revision accounts for -1.44%, while special measures for insurance coverage for fertility treatment account for +0.09% (health care expenditure base)
2023	-JPY 310 billion		For items exceeding the average discrepancy rate of 0.625 times (4.375%) Adjustable range: 2% Special/temporary measures to recalculate prices of unprofitable items and to introduce new pharmaceuticals creation premium

Source: Compiled by Mizuho Bank Industry Research Department based on materials from the 207th Central Social Insurance Medical Council Special Committee on Drug Prices.

Changes in drug expenditures (with FY2011 as 100)



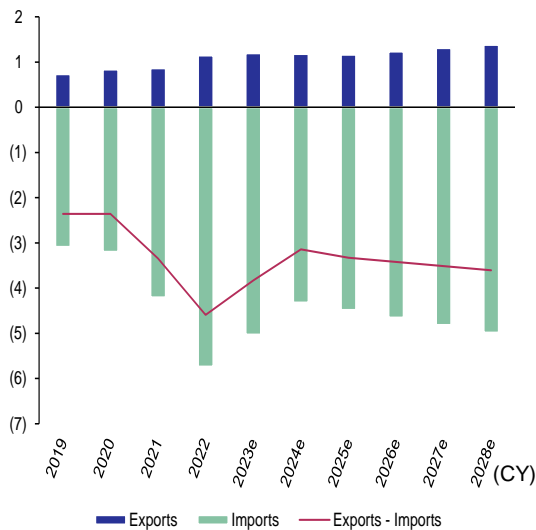
Source: Compiled by Mizuho Bank Industry Research Department based on materials from the 188th Central Social Insurance Medical Council Special Committee on Drug Prices.

[Exports/Imports/Production] Exports, imports, and domestic production all forecasted to increase in medium term

- Due to COVID-19, exports and imports of diagnostic drugs and vaccines increased. In 2024, the factors behind these increases are forecasted to fade away, leading to a temporary decrease in exports and imports. If transient factors are excluded, medium-term exports and imports are forecasted to increase due to increased domestic and international demand.
- For technology export/import income and expenditures, net receipts stayed level but had decreased every fiscal year from FY2018 to FY2020.
- Domestic production has increased overall due to increased demand for COVID-19-related products and stockpiling. In 2024, these factors are forecasted to fade away, leading to a decrease in domestic production. In the medium term, domestic production is forecasted to increase due to increased demand and strengthening of the domestic production system.

Medium-term export/import forecasts

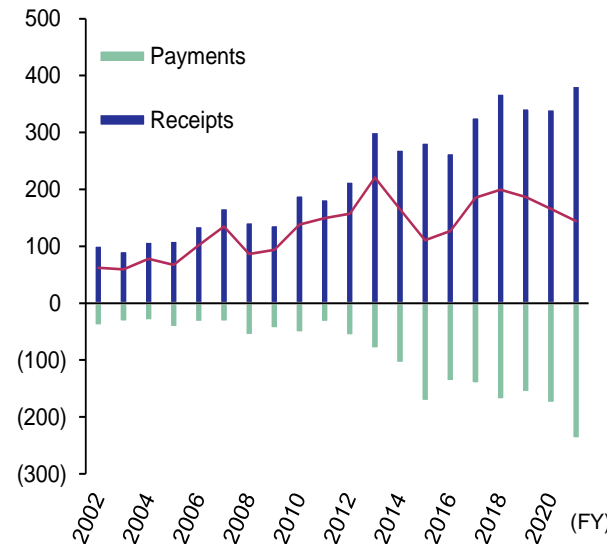
(JPY trillion)



Note: Figures for 2023 onwards are forecasts by Mizuho Bank Industry Research Department.
 Source: Compiled by Mizuho Bank Industry Research Department based on Ministry of Finance "Trade Statistics of Japan."

Technology export/import income and expenditures

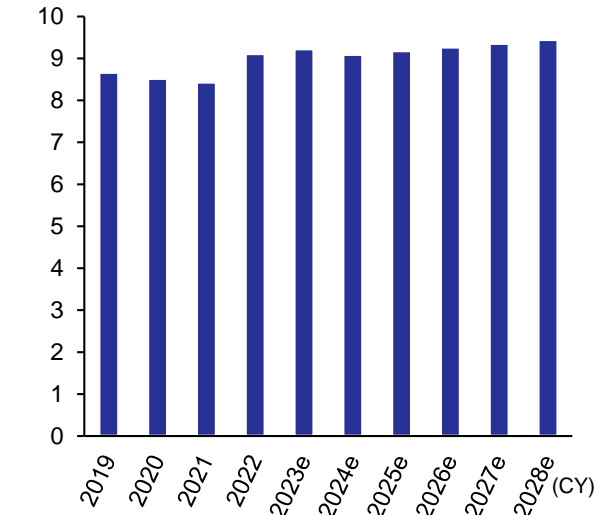
(JPY billion)



Note 1: Excludes parent-subsidiary transactions.
 Note 2: FY2021 includes parent-subsidiary transactions due to the amount of transactions being confidential.
 Source: Compiled by Mizuho Bank Industry Research Department based on Ministry of Internal Affairs and Communications "Report on the Survey of Research and Development."

Medium-term forecast for domestic production

(JPY trillion)

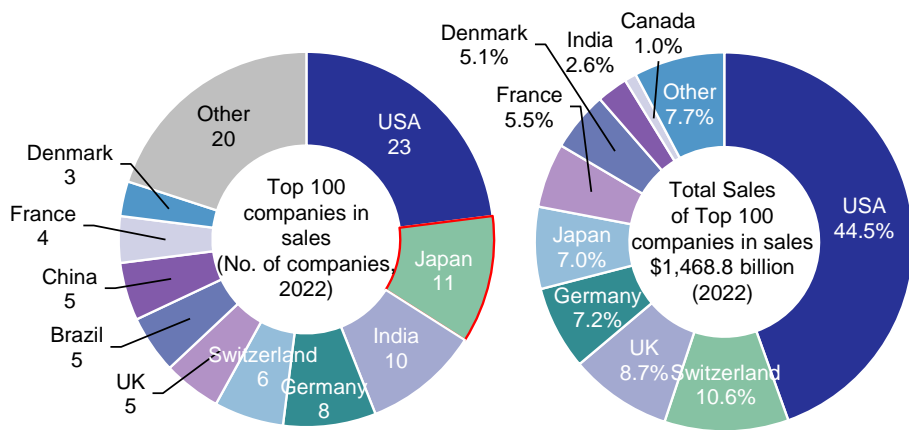


Note: Figures for 2019-2021 cited from Statistics of Production by Pharmaceutical Industry annual reports. Figures for 2022 estimated from totals of monthly reports. Figures for 2023 onwards are forecasts by Mizuho Bank Industry Research Department.
 Source: Compiled by Mizuho Bank Industry Research Department based on MHLW "Statistics of Production by Pharmaceutical Industry."

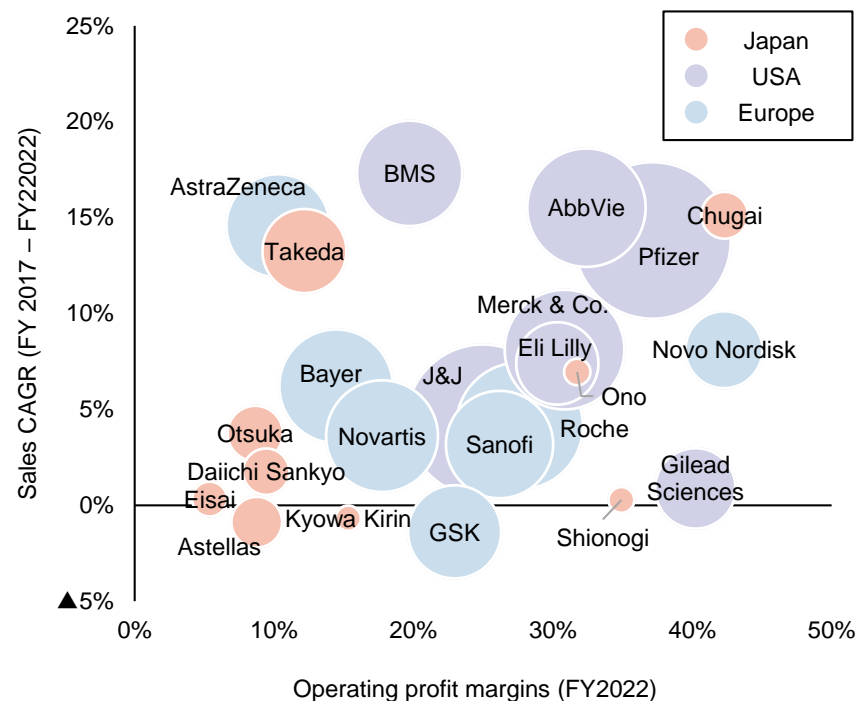
Japanese companies have large global presence but lag greatly behind US and European companies

- Japanese companies boast a strong global presence, accounting for 11 of the top 100 companies by sales worldwide, the second largest number after the US.
 - However, Japan is only 5th worldwide in market share. In global terms, many Japanese companies are mid-sized.
- Many Japanese companies lag behind the top US and European companies by sales volume, profitability, and growth.

Proportion of Japanese companies among top 100 companies by sales



Comparisons of profitability, growth, and sales among major Japanese and US/European companies



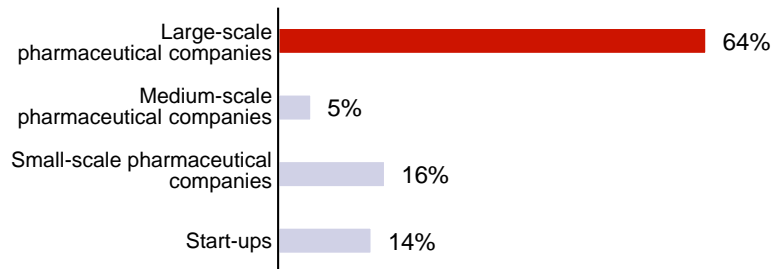
Source: Compiled by Mizuho Bank Industry Research Department based on IQVIA World Review, Data Period – Year 2022. (Copyright © 2023 IQVIA. Unauthorized reproduction prohibited.)

Note: Bubble sizes represent sales (FY2022). Source: Compiled by Mizuho Bank Industry Research Department based on SPEEDA.

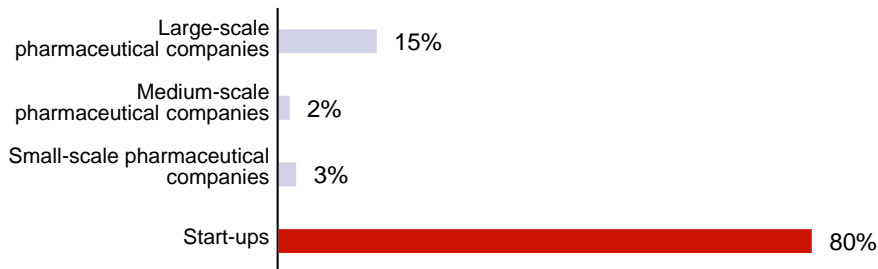
Growing presence of start-ups as sources of drug discovery

- Major pharmaceutical companies account for 64% of the global share of pharmaceutical sales, whereas start-ups account for only 14%. However, start-ups have a towering presence in drug discovery, accounting for 80% of drugs discovered and developed.
- US and European companies are actively expanding by proactively acquiring other companies.
 - Many acquisitions are of fledgling companies founded within the last 10 years, and US and European companies are boosting their competitiveness by incorporating these fledgling companies' pipelines and basic technology.

Global shares of pharmaceutical sales (by scale of company)



Global shares of pharmaceuticals discovered and developed (by scale of company)



Source: Compiled by Mizuho Bank Industry Research Department based on Headquarters for Healthcare Policy "5th Pharmaceutical Development Conference" materials.

Major pharmaceutical industry acquisitions (2023)

Date announced	Buyer	Company acquired	Year founded	Amount
2023/1/9	AstraZeneca	CinCor Pharma	2018	Max. USD 1.8 billion
2023/3/13	Pfizer	Seagen	1997	USD 43 billion
2023/3/13	Sanofi	Provention Bio	2016	USD 2.9 billion
2023/5/1	Astellas Pharma	Iveric Bio	2007	USD 5.9 billion
2023/4/16	Merck & Co.	Prometheus Biosciences	2016	USD 10.8 billion
2023/6/12	Novartis	Chinook Therapeutics	2019	Max. USD 3.5 billion
2023/6/20	Eli Lilly	DICE Therapeutics	2013	USD 2.4 billion
2023/6/26	Shionogi & Co., Ltd.	Qpex Biopharma	2018	Max. USD 40 mil
2023/6/29	Eli Lilly	Sigilon Therapeutics	2015	Max. USD 310 mil
2023/7/14	Eli Lilly	Versanis Bio	2021	Max. USD 1.9 billion
2023/7/28	Biogen	Reata Pharmaceuticals	2002	USD 7.3 billion
2023/8/10	Novo Nordisk	Inversago Pharma	2015	Max. USD 1.1 billion
2023/7/17	Novartis	DTx Pharma	2017	USD 500 mil
2023/9/1	Otsuka Pharmaceutical	Mindset Pharma	2019	CAD 80 mil
2023/10/8	BMS	Mirati Therapeutics	1995	USD 5.8 billion
2023/10/5	Kyowa Kirin	Orchard Therapeutics	2015	USD 480 million
2023/10/3	Eli Lilly	POINT Biopharma	2019	USD 1.4 billion

Note: Fields in blue represent acquisitions of companies founded in 2013 or later.

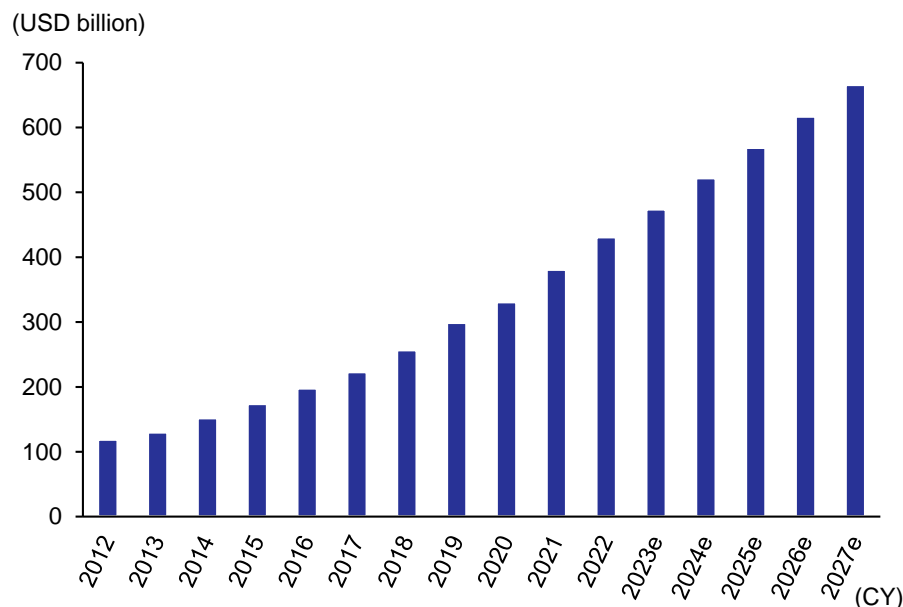
Source: Compiled by Mizuho Bank Industry Research Department based on public information.

Opportunity offered by growth in markets for new modalities

- Markets for new modalities such as gene/cell therapy are expected to grow rapidly, presenting an opportunity for pharmaceutical companies.
 - Although growth in the overall antibody drug market is expected to slow due to off-patent versions of major drugs, new drugs remain in high demand and are anticipated to be a growth area going forward.
- Japanese companies are also actively developing new modalities and must continue these initiatives more vigorously, both domestically and internationally.

Analyst's view

Medium-term forecast for the global biopharmaceutical market



Note: Biopharmaceuticals in this figure include not only traditional therapeutics, such as insulin analogs, but also more complex specialty pharmaceuticals, gene/cell therapy, etc.

Source: Compiled by Mizuho Bank Industry Research Department based on IQVIA Institute "Global Use of Medicine 2023 Outlook to 2027."

Initiatives to develop new modalities

Modality	Company	Major initiative
Gene therapy	Kyowa Kirin	■ Acquired Orchard Therapeutics in Oct. 2023 and entered gene therapy space
Cell therapy	Astellas Pharma	■ Concluded a collaboration agreement with Poseida Therapeutics in Aug. 2023 that includes strategic investment in cell therapy
mRNA vaccines	Daiichi Sankyo	■ Obtained approval in Aug. 2023 for Daichirona for Intramuscular Injection, an mRNA vaccine for COVID-19
Exosome therapy	Nippon Shinyaku	■ Obtained domestic distribution rights in Feb. 2023 from Capricor Therapeutics for CAP-1002, a cell therapy product that secretes exosomes (distribution rights obtained in US in 2021)
Micro-biomes	Ferring Pharma (Switzerland)	■ Obtained FDA approval in Nov. 2022 for the fecal microbiota product Rebyota
Therapy apps	SUSMED	■ Obtained approval in Feb. 2023 to manufacture and distribute an app to treat insomnia

Source: Compiled by Mizuho Bank Industry Research Department from public information.

Growing importance of strengthening domestic drug discovery capability and building drug discovery ecosystem

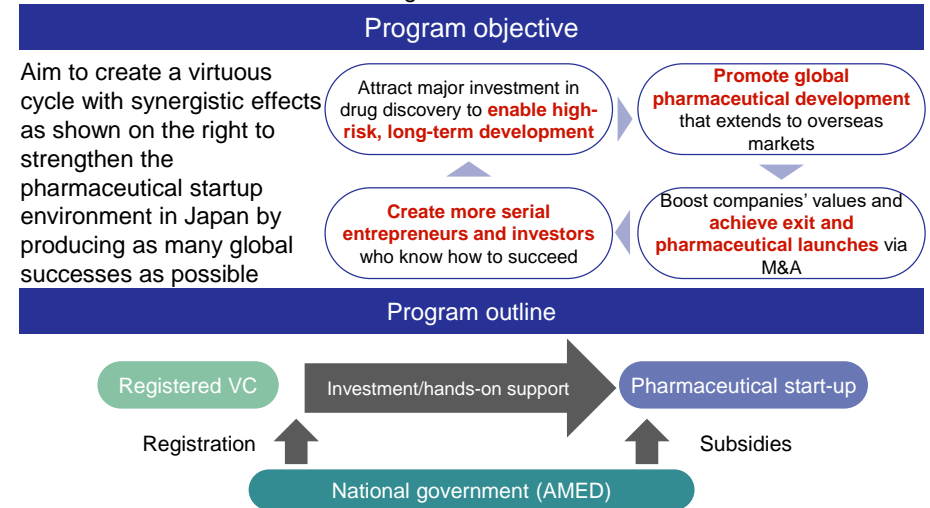
- The Japanese pharmaceutical market is forecasted to demonstrate low growth by global standards, and its presence may diminish going forward.
 - Also, Japanese pharmaceutical companies lag far behind top European companies and must accelerate their growth going forward.
- To increase domestic development of new drugs and strengthen the global presence of Japanese pharmaceutical companies, the strengthening of Japan’s drug discovery capability is urgently needed.
- AMED’s Strengthening Program for Pharmaceutical Startup Ecosystem, launched in 2022, aims to enhance drug discovery capability by subsidizing pharmaceutical startups that receive investment from registered venture capital firms.

Issues with the Japanese pharmaceutical industry and solutions

	Japanese pharmaceutical market perspective	Japanese pharmaceutical company perspective
Status (issue)	<ul style="list-style-type: none"> ■ Japanese share in the global market in decline → Low market growth may slow domestic development of new drugs 	<ul style="list-style-type: none"> ■ Despite large global presence, sales volume, profitability, and growth lag far behind top US and European companies
Solution	<p align="center">Strengthening drug discovery capability</p> <ul style="list-style-type: none"> ■ Create an environment conducive to the emergence of drug discovery start-ups in Japan, promote domestic drug development, and enhance the pipeline for major companies via acquisitions and licensing 	
	<p align="center">Making the market more attractive</p> <ul style="list-style-type: none"> ■ Ensure the economic rationality of pharmaceutical companies through reform of the drug pricing system ■ Promote entry of overseas start-ups into Japan through reform of the pharmaceutical system 	
Ideal state	<ul style="list-style-type: none"> ■ Continuous launch of revolutionary new drugs by companies in Japan and abroad, and boosting of the global presence of the Japanese market 	<ul style="list-style-type: none"> ■ Launching Japanese pharmaceuticals domestically and globally, and standing shoulder-to-shoulder with US and European companies

[Example] Strengthening Program for Pharmaceutical Startup Ecosystem

- To solve the issue of limited availability of large-scale development funds, this program registers VCs that specialize in drug development and provide hands-on business development support and supports the development and commercialization efforts of pharmaceutical startups on the condition that they receive investment from such registered VCs.



Source: Compiled by Mizuho Bank Industry Research Department.

Source: Compiled by Mizuho Bank Industry Research Department based on AMED “Strengthening Program for Pharmaceutical Startup Ecosystem.”

In Japan, deliberations proceeding on measures to address various issues with pharmaceutical industry

- In August 2022, the Ministry of Health, Labour and Welfare established the “Welfare Expert Panel on Comprehensive Measures to Achieve a Rapid and Stable Supply of Pharmaceuticals,” identified issues with the Japanese pharmaceutical industry, and deliberated solutions. A report was submitted in June 2023.
- “Strengthening drug discovery capability” was cited as a key issue, and further expansion of support and system reforms are anticipated.

Excerpts from the Report of the Welfare Expert Panel on Comprehensive Measures to Achieve a Rapid and Stable Supply of Pharmaceuticals

	Major issues	Trends in measures
1) Securing a stable supply	<ul style="list-style-type: none"> ■ Shipment has stalled for many products, primarily generics. ■ This is due to structural issues in the production of generics, namely high-mix low-volume manufacturing, resulting from many companies with small-scale and limited production capacity. 	<p>Resolving the issue of high-mix low-volume production of generics</p> <ul style="list-style-type: none"> ■ Consideration of drug prices at the time of new listing and revision ■ Promoting optimization of product mix and strengthening of production capacity, including potentially restructuring the industry ■ Supporting expansion of production lines to optimize product mix
2) Strengthening drug discovery capability	<ul style="list-style-type: none"> ■ Japanese drug discovery capability is in decline, as evidenced by the decreased global market share of Japanese pharmaceuticals. ■ Transition to an R&D business model must be promoted, as evidenced by the delayed shift to new modalities. 	<p>Supporting the creation of new modalities</p> <ul style="list-style-type: none"> ■ Proactive investment in new modalities and support for companies' international expansion <p>Building a drug discovery ecosystem</p> <ul style="list-style-type: none"> ■ Constant start-up support, from development to launch and overseas expansion <p>Focusing management resources on R&D for revolutionary drug discovery</p> <ul style="list-style-type: none"> ■ Reforming the drug pricing system to promote revolutionary drug discovery and transition to generics
3) Resolving drug lag/drug loss ^(note)	<ul style="list-style-type: none"> ■ There are 143 products that have been approved in the US and Europe but not in Japan. For 86 of these, domestic development has not begun, causing growing fears of drug loss ■ Many of these drugs on which development has not begun are drugs from start-ups for rare diseases or pediatric use 	<p>Forming an environment for rapid introduction of revolutionary pharmaceuticals</p> <ul style="list-style-type: none"> ■ Clarifying the necessity of Japanese patient data in pharmaceutical approval <p>Enhancing the response to currently occurring drug lag/loss</p> <ul style="list-style-type: none"> ■ Building a system that enables early treatment with advanced medical care and patient-proposed health services, etc. <p>A drug pricing system that makes the Japanese market more attractive</p> <ul style="list-style-type: none"> ■ Considering new methods for assessing the price of revolutionary pharmaceuticals
4) Achieving suitable pharmaceutical distribution	<ul style="list-style-type: none"> ■ There has been an increase in transactions aimed at obtaining drug-price margins, such as conducting negotiations to reduce the total price based on previous drug reforms, regardless of the prices of drug products, in order to strengthen price negotiating ability by scaling up chain pharmacies and companies that handle price negotiations, and to obtain business resources. ■ In some cases, uneven distribution of excessive drug price differences has been an issue. 	<ul style="list-style-type: none"> ■ Correcting trade practices unique to pharmaceuticals and excessive drug price differences ■ Revising distribution improvement guidelines to improve lump-sum transactions <p>[Issue for further discussion]</p> <ul style="list-style-type: none"> ■ Discussion of how to set the adjustable range required to stabilize drug distribution

Note: “Drug lag” refers to pharmaceuticals which have been approved in the US and Europe but not in Japan. Cases where development has not begun on these drugs in Japan is referred to as “drug loss.”

Source: Compiled by Mizuho Bank Industry Research Department based on MHLW “Report of the Welfare Expert Panel on Comprehensive Measures to Achieve a Rapid and Stable Supply of Pharmaceuticals.”

4. Logistics

Involvement is Required in Development of Platform aimed at realizing Physical Internet

<p>I. Supply and Demand Trends</p>		<p>(Global Demand)</p> <ul style="list-style-type: none"> ■ In the short term, due to the significant slowdown in demand for transportation from Asia to North America driven by U.S. retail stockpiling in 2023, all target routes are expected to be -3.3% YoY, but then bounce back to +2.7% in 2024 ■ Over the medium term, cargo movement is expected to increase in line with economic growth in each country. However, a trend toward expanding protectionism and near shoring (shifting production and business locations to countries neighboring consumers) from the perspectives of supply chain risk mitigation is anticipated, causing a slowdown in growth <p>(Domestic Demand)</p> <ul style="list-style-type: none"> ■ With regard to domestic truck transport volume (B2B), in the short term, demand for consumption-related cargo is steadily expected thanks to inbound tourism demand. However, reductions in construction-related cargo are expected due to flat trends in housing investment, ultimately leading to a small decrease of -0.6% in FY2023. In the medium term, decreases in consumer spending, flat trends in housing investment, etc. are forecast to cause a gradual decrease ■ With regard to the number of home deliveries (B2C), the drop-off in pandemic-induced stay-home demand combined with inflation-driven purchasing hesitancy are expected to ultimately lead to a small decrease in the short term. In the medium term, they are expected to gradually increase as the EC market expands
<p>II. Topics</p>	<p>Competitive Environment</p>	<ul style="list-style-type: none"> ■ The population decline and the 2024 problem (upper limit on driver working hours) have further fueled concerns about the sustainability of logistics. In the short to medium term (within five years), such an environment concerning domestic logistics has accelerated initiatives about the building of alliances and alliances toward logistics standardization and sharing between peripheral players (such as shippers, developers, and trading companies) ■ In the long term (six years or more), alliances for standardization and sharing are forecast to firm up to an extent in specific industries and business fields
	<p>Risks and Opportunities</p>	<p>(Risks)</p> <ul style="list-style-type: none"> ■ Development of the Physical Internet (PI) to achieve standardization and sharing in logistics requires (1) shared logistics assets, (2) the network of shippers and transport operators using PI platforms, and (3) developing platforms connecting shippers and transport operators ■ As initiatives by peripheral players to achieve PI accelerate, initiatives to avoid a subordinate relationship developing are important <p>(Opportunities)</p> <ul style="list-style-type: none"> ■ As PI platform development moves ahead, in the short to medium term, logistics companies leverage their operations and transport arrangement know-how and therefore enhance their involvement in platforms. By doing so, they can make the processing and analysis of information collected on platforms as well as optimal logistics offerings possible in the long term
	<p>Analyst's View</p>	<p>(As the first step to realize PI, it is important for logistics companies to identify the industries and fields in which they can demonstrate added value)</p> <ul style="list-style-type: none"> ■ As PI moves towards becoming a reality, it is important for logistics companies to identify the industries in which they can demonstrate and build added value as well as participate in alliances and alliances for developing PI from an early stage in order to demonstrate their presence ■ In addition, It would be possible to respond to further advanced standardization and sharing in logistics in the future by demonstrating added value and know-how as logistics companies and engaging in PI developing from an early stage

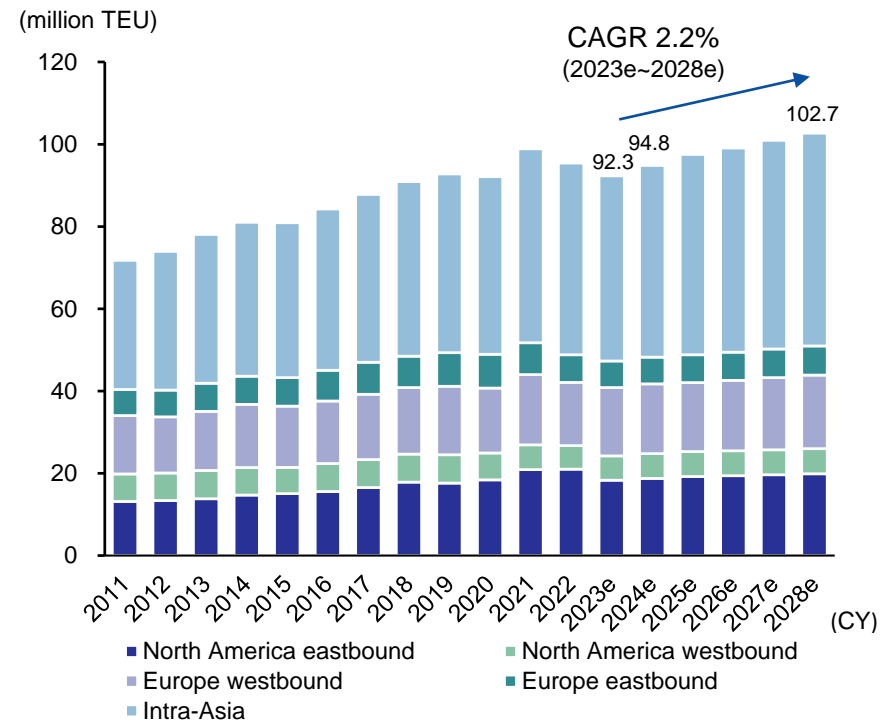
Source: Compiled by Mizuho Bank Industry Research Department

Global Demand: Short Term Demand for Transportation Recovery, but Gradual Growth Speed in the Medium Term

- Due to the significant slowdown in freight transportation from Asia to North America driven by retail stockpiling, maritime container cargo volume in 2023 across all target routes is expected to be -3.3% YoY, but then bounce back to +2.7% in 2024 once the excessive inventory issue is resolved
- Over the medium term, cargo movement is expected to increase in line with economic growth in each country. However, a trend toward expanding protectionism and near shoring from the perspectives of supply chain risk mitigation is anticipated, causing a slowdown in growth (annual rate of +2.2% across all target routes)
- In terms of supply and demand balance, from 2023 onwards, despite an increase in tonnage due to continued completions of new container ships and implied softening of market conditions are expected. On the other hand, it is forecast on the supply side that a reduction in alliance units will lead to a certain degree of freight charge

Medium-term outlook in global maritime container cargo volume

(thousand TEU)	2022 (actual)	2023 (forecast)	2024 (projection)	2028 (projection)	CAGR 2023-2028
North America eastbound (from Asia to North America)	21,010	18,314	18,772	19,880	-
YoY	+0.6%	-12.8%	+2.5%	-	+1.7%
North America westbound (from North America to Asia)	5,706	5,943	6,033	6,111	-
YoY	-5.4%	+4.2%	+1.5%	-	+0.6%
Europe westbound (from Asia to Europe)	15,395	16,613	16,945	17,901	-
YoY	-9.8%	+7.9%	+2.0%	-	+1.5%
Europe eastbound (from Europe to Asia)	6,728	6,440	6,504	7,062	-
YoY	-13.2%	-4.3%	+1.0%	-	+1.9%
Intra-Asia routes	46,604	45,011	46,587	51,751	-
YoY	-1.1%	-3.4%	+3.5%	-	+2.8%
Target routes total	95,443	92,322	94,841	102,704	-
YoY	-3.5%	-3.3%	+2.7%	-	+2.2%



Note: FY2023 values onwards in both figures are predictions by the Mizuho Bank Industry Research Department

Source: Figures compiled by Mizuho Bank Industry Research Department based on Japan Maritime Center materials and other various materials

Domestic Demand: Short to Medium Term Decline in B2B Market. Gradual Expansion of B2C Market

- In terms of domestic truck transport volume (B2B) in FY2023, demand for consumption-related cargo is steadily expected thanks to inbound tourism demand. However, flat trends in housing investment are forecast to drive reductions in construction-related cargo, which accounts for a large share of transport volume, ultimately leading to -0.6% YoY overall. Similar trends are expected to continue in FY2024
- In the medium term, population decline, decreases in consumer spending, and flat trends in housing investment, etc. are forecast to cause a gradual decrease in domestic truck transport volume (B2B). The number of home deliveries (B2C) is expected to increase as the EC market gradually expands

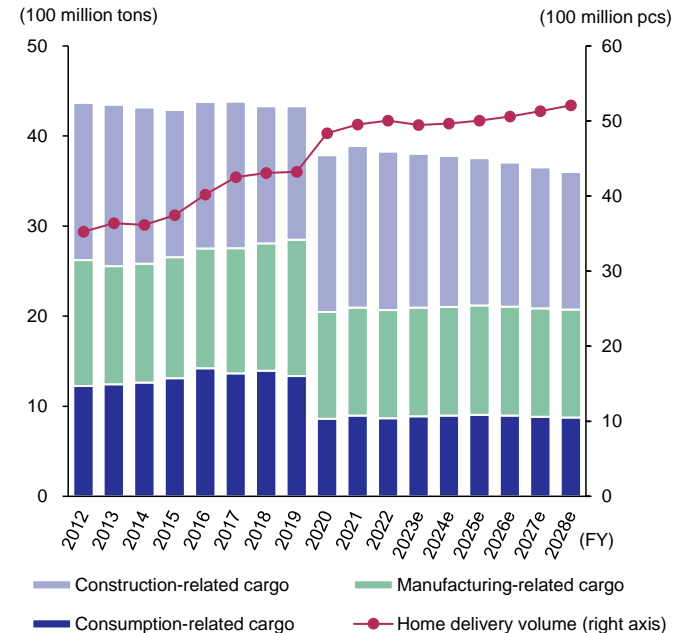
Medium term outlook for domestic truck transport volume (B2B) and home delivery volume (B2C)

Domestic truck transport volume (B2B)

(million tons)	FY2022 (actual)	FY2023 (forecast)	FY2024 (projection)	FY2028 (projection)	CAGR 2023-2028
Consumption related	867	889	898	876	-
YoY	-3.4%	+2.6%	+1.0%	-	-0.3%
Manufacturing related	1,203	1,205	1,206	1,197	-
YoY	+0.5%	+0.2%	+0.1%	-	-0.1%
Construction related	1,757	1,708	1,674	1,526	-
YoY	-2.1%	-2.8%	-2.0%	-	-2.2%
Total	3,826	3,802	3,777	3,599	-
YoY	-1.6%	-0.6%	-0.6%	-	-1.1%

Home delivery volume (B2C)

(million pcs)	FY2022 (actual)	FY2023 (forecast)	FY2024 (projection)	FY2028 (projection)	CAGR 2023-2028
Home delivery volume	5,006	4,948	4,965	5,209	-
YoY	+1.1%	-1.2%	+0.3%	-	+1.0%



Note 1: FY2023 values onwards in both figures are predictions by the Mizuho Bank Industry Research Department

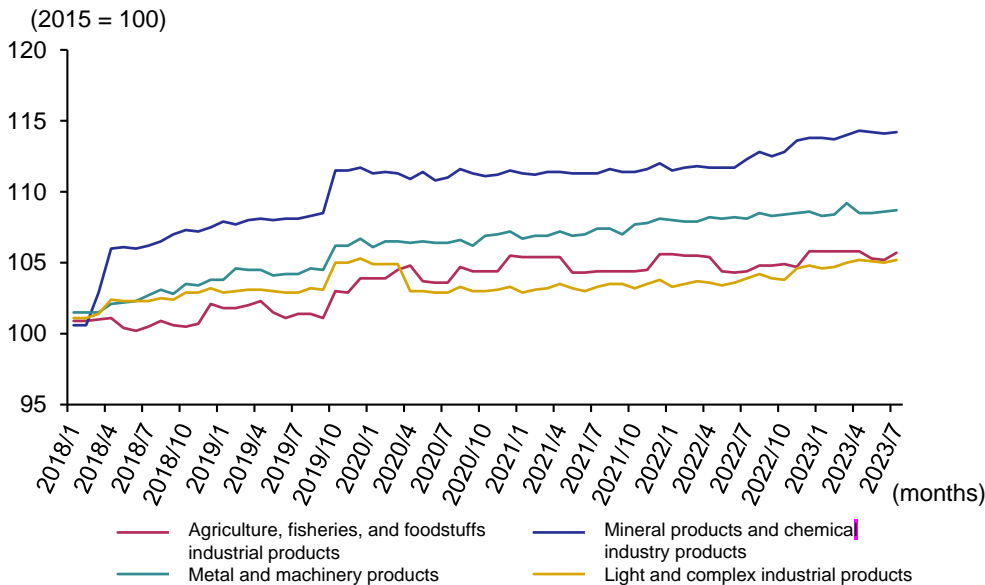
Note 2: Regarding the right figure, the survey method and aggregation method for freight vehicles changed from April 2020, so there is discontinuity in the statistical information between FY2019 and FY2020

Source: Both figures compiled by Mizuho Bank Industry Research Department based on Ministry of Land, Infrastructure, Transport and Tourism statistics

Domestic Supply and Demand Balance: Ongoing Trend to Increasing Freight Charges due to Rising Labor and Fuel Costs

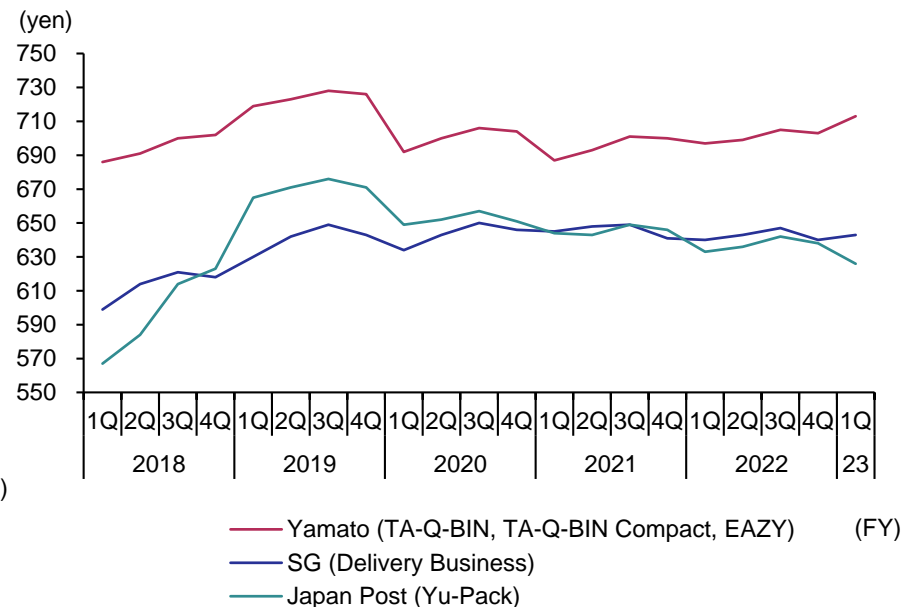
- On the demand side, while domestic truck transport volume (B2B) is declining, increasing home delivery volume (B2C) is driving shipments in smaller quantities and transport in higher frequencies
- On the supply side, amid the ongoing high cost of transport and delivery, operators are also experiencing difficulties in attracting new employee. Coupled with factors such as the future impacts of a declining birthrate/aging population and the 2024 problem, these trends may accelerate the industry labor shortage.
- In terms of logistics charges and delivery rates, in the short term supply-side issues such as rising labor and fuel costs are triggering price increase negotiations towards shippers, with current prices on the rise. In the medium term as well, the increasing trend may continue due to factors such as the 2024 problem

Trends in Road Freight Transportation Price Indicators



Source: Compiled by Mizuho Bank Industry Research Department based on the Bank of Japan "Corporate Services Price Index"

Rate Trends among the Three Major Delivery Operators

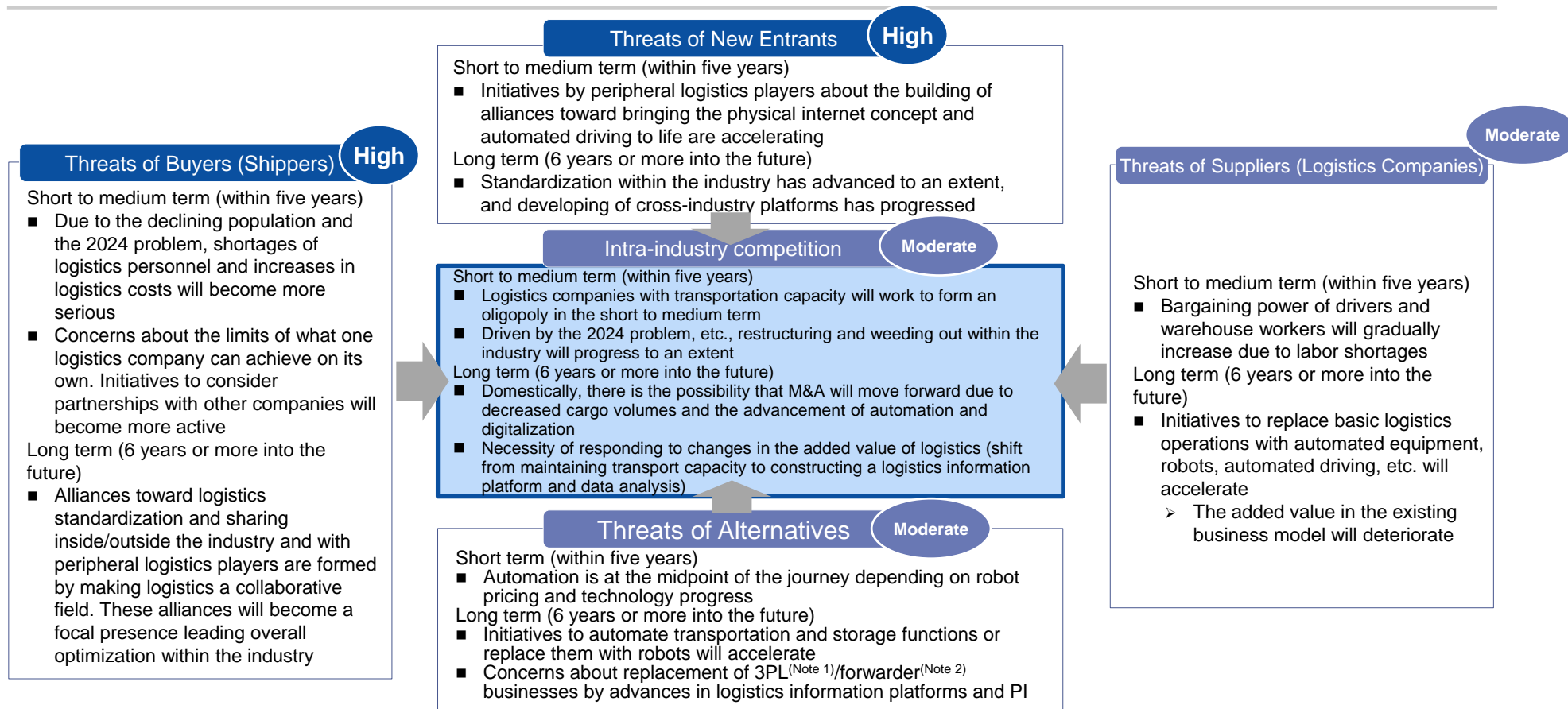


Source: Compiled by Mizuho Bank Industry Research Department based on IR materials from the respective companies

Moves Toward Logistics Standardization and Sharing in Japan are Accelerating and the Competitive Environment is Intensifying

- Factors such as the population decline and the 2024 problem have fueled concerns about the sustainability of logistics in Japan, and also accelerated initiatives about the building of alliances toward logistics standardization and sharing between peripheral players.

5 force analysis of the Japanese logistics industry environment



Note 1: "3PL is an abbreviation for 3rd Party Logistics. It refers to a logistics business form in which the most efficient logistics strategy is planned on behalf of the shipper company, with the logistics services then being comprehensively contracted and executed.

Note 2: "Forwarders" refers to logistics companies that handle cargo on behalf of shippers, transporting it using the logistics resources (such as trucks, ships, and aircraft) of other operators

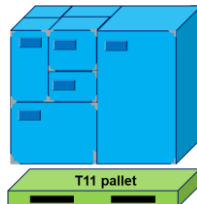
Source: Compiled by Mizuho Bank Industry Research Department

Realizing the Physical Internet (PI) is Becoming Critical for the Sustainability of Logistics

- Given domestic issues such as the population decline and the 2024 problem, building sustainable logistics networks with limited resources (drivers, warehouse workers, warehouses, vehicles) will become necessary
- By standardizing transport rates and opening up logistics networks, PI will enable the progression of logistics sharing and creating a collaborative field between shippers and logistics companies to a greater extent than previously, thereby delivering stable operation even with limited logistics resources

Features of PI

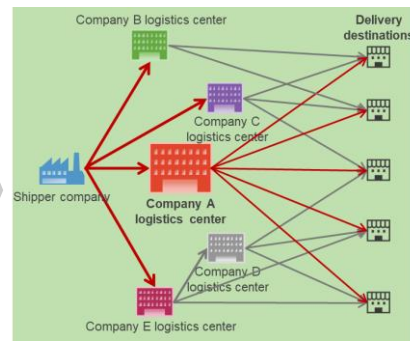
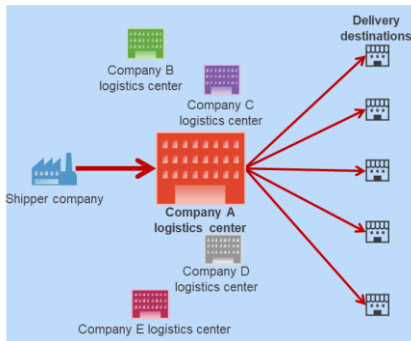
Feature 1: Standardization of transport rates



- Standardized PI containers (anticipate multiple sizes to suit demand)
- Constant connectedness using electronic tags etc.

- Modularization so that linked base areas create a size based on the industry-standard T11 pallet

Feature 2: Opening up logistics networks



- Logistics companies provide services using only in-house networks

- Providing services also using other companies' opened logistics networks

Source: Compiled by Mizuho Bank Industry Research Department

Anticipated benefits of PI for changes in industry environment

Changes in industry environment

- Due to the declining population and the 2024 problem, shortages of personnel and increases in logistics costs will become more serious
- Building sustainable logistics networks with limited resources (drivers, warehouse workers, warehouses, vehicles) will become necessary

Benefits of PI

Features	Main benefits	Details
(1) Standardization	<ul style="list-style-type: none"> Cost reductions 	<ul style="list-style-type: none"> Advancing mechanization of handling work reduces labor costs Standardization of packing styles reduces tasks relying on throwing lots of manpower at them, improving productivity and reducing costs
	<ul style="list-style-type: none"> Effective use of logistics resources Eliminating multi-layered subcontracting structures Increased flexibility in logistics strategies 	<ul style="list-style-type: none"> Effective use of limited logistics resources Opening up enables visualization of transport and delivery tasks, potentially contributing to eliminating multi-layered subcontracting structures Enables creating optimal logistics strategies not limited by in-house logistics networks Improved supply chain redundancy in the event of disasters
(2) Open network		

However, considerable time will be required to realize the PI. Therefore initiatives are first being made toward standardization and sharing as well as developing open platforms in industries and fields where PI is easy to achieve

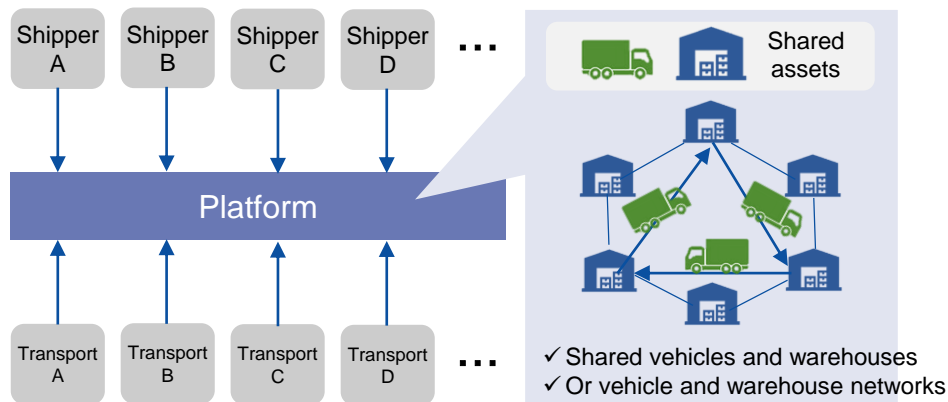
Source: Compiled by Mizuho Bank Industry Research Department

Risks: Initiatives Toward Developing PI are Advancing by Peripheral Logistics Players

- Develop of the Physical Internet (PI) requires (1) shared logistics assets (warehouses and vehicles), (2) shippers and transport operators using PI platforms, and (3) developing platforms and systems connecting shippers and transport operators
 - As the added value fields (maintaining and arranging transportation capacity, etc.) of logistics companies may be encroached upon by other companies with the above three factors in place, it is important to shift to strategies and business models regarding PI that avoid a subordinate relationship developing
- Initiatives by peripheral logistics players (such as shippers, developers, and trading companies) toward making PI happen are now also accelerating

Analyst's view

Elements necessary for developing PI



Elements necessary for developing PI

- Shared logistics assets (vehicles, warehouses, etc.)
- Platform user (shippers and transport operators) networks
- The ability to build platforms and systems connecting shippers and transport operators (creating matching alliances etc.)

If a company has the know-how and networks to obtain the above three factors, even non-logistics companies may be able to bring significant parts of the PI concept to life

Source: Compiled by Mizuho Bank Industry Research Department

Examples of initiatives toward developing PI

Example 1: alliance created at the instigation of a trading company

- ✓ Mitsui & Co. has sourced technology from Preferred Networks, establishing T2 in August 2022 to provide line haul services using self-driving trucks
- ✓ In June 2023, the company signed a capital and business partnership with Mitsubishi Estate - which has strengths in warehouse networks - to build logistics networks compatible with self-driving trucks
- ✓ In September 2023, Usami Kohyu, Toho Acetylene, Mitsui Sumitomo Insurance, Mitsui-Soko Logistics, JA Mitsui Leasing, KDDI, Kiyu Capital Management, Daiwa Logistics, and Sumitomo Mitsui Trust Bank announced capital investment in T2
- ✓ The plan is to expand logistics networks and roll them out nationwide toward making PI a reality, as the national government aims for

Example 2: alliance created at the instigation of a commercial vehicle manufacturer

- ✓ In 2018, Hino Motors and others established a new company, Next Logistics Japan, aiming to increase efficiency in line haul logistics
- ✓ The plan is to apply the commercial vehicle manufacturer's CASE technology to increase efficiency and save labor through shared transport, self-driving, etc. as well as reduce CO₂ emissions through vehicles utilizing leading-edge technology
- ✓ Shippers, financial institutions, and logistics companies are participating in this effort to make line haul a collaborative field
- ✓ Positioned as part of initiatives toward PI implementation in corporate logistics

Various companies in various regions are taking initiatives toward achieving PI

Source: Compiled by Mizuho Bank Industry Research Department based on press releases and information disclosed by each company.

Opportunities: Improving Presence in the Short to Medium Term Helps Enable Long-Term Changes in Added Value

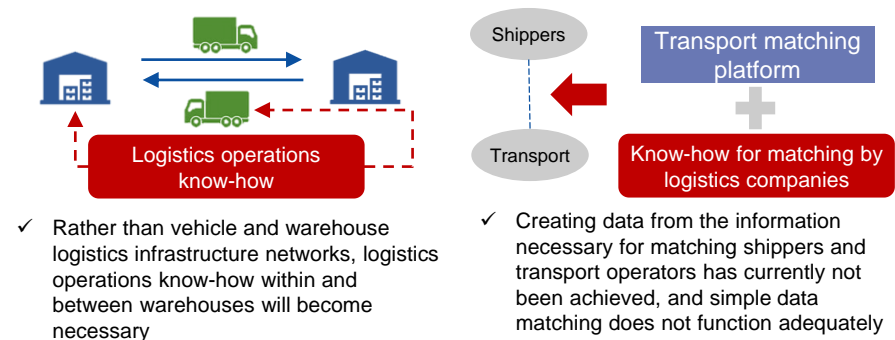
- As well as the factors necessary for PI platform development, the existing added value that logistics operators have (such as operations and transport arrangement know-how) is also necessary in the short to medium term, making it important for them to improve their presence as logistics companies at this stage
- As existing added value will only continue to diminish in the long term due to the advancement of automation and digitalization, contributing to platforms and improving presence in the short to medium term may lead to strengthening subsequent added value fields (the processing and analysis of information as well as optimal logistics offerings based on analysis)

Opportunities: Added value fields that logistics companies can demonstrate toward PI development

Elements necessary for developing PI (from the previous slide)

- Assets (shared vehicles and warehouses)
- Platform user network (shippers and transport operators) networks
- The ability to develop platforms and systems connecting shippers and transport operators (creating matching alliances etc.)

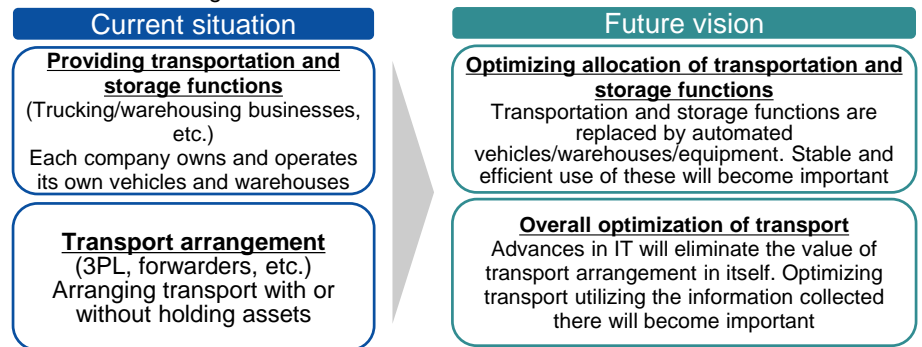
Considerable time will be required to achieve the full automation and mechanization of operations in the short to medium term. The know-how to match the operational know-how of logistics companies with cargo and transport operators will therefore become necessary



Source: Compiled by Mizuho Bank Industry Research Department

Decisive action: Strengthening the capacity to make optimal logistics offerings based on information processing and analysis capabilities

Changes in the added value of logistics companies due to the advancement of automation and digitalization



Value in transportation capacity

Value in information processing, optimization, and effective utilization

As automation and digitalization advance in addition to PI becoming reality, the existing added value of logistics operators will fall

Actions logistics companies should take

In the long term, building the capacity to process and analyze information collected on platforms and the ability to make optimal logistics offerings based on that analysis will become more important than transportation capacity and logistics operations capabilities

- ✓ Envisaging an industry in which the above added value can be demonstrated and appropriate positions secured
- ✓ Collaborating with partners toward constructing logistics information platforms, etc.

Source: Compiled by Mizuho Bank Industry Research Department

As Part of Realizing PI, it is Important for Logistics Companies to Identify the Industries and Fields in which they can Provide Added Value

- As PI towards becoming a reality, it is important for logistics companies to identify the industries in which they can demonstrate and build the added value discussed on the previous slide, as well as participate in alliances and alliances for developing PI from an early stage in order to demonstrate their presence
- In addition, it would be possible to strengthen responsiveness to further advanced standardization and sharing in logistics in the future by demonstrating added value and know-how as logistics companies - as discussed on the previous slide - by participating in industries and fields in which PI is relatively easy to achieve at an early stage

Identifying fields in which advancing the PI concept is relatively easy

Factors making PI easy to achieve

- Industries and fields where standardization of hardware (pallets, vehicles, etc.) as well as software (order making and receipt data, systems, etc.) is progressing
- Easy-to-handle cargo that does not require special know-how and operations to manage
- Relatively small numbers of items and SKUs^{note}
- Upstream, midstream, and downstream players are consolidated to a degree
- Clearly-identified players with the ability and influence to take the lead in standardization and sharing within the industry
- Maintaining sustainable logistics is a pressing issue throughout the industry

For example

Ease of palletization	<ul style="list-style-type: none"> ■ Advanced industries: Soft drinks and liquor, convenience stores, paper and pulp, etc. ■ Lagging industries: Clothing, daily necessities and cosmetics, chemicals etc.
Clarifying roles of industry players	<ul style="list-style-type: none"> ■ Advanced industries: Chemicals, soft drinks and liquor, foodstuffs, etc. ■ Initiatives for pallet commonality and logistics sharing within the industry are already accelerating in the above industries

Identifying industries in which advancing standardization and sharing is relatively easy - as well as identifying the power relationships between industry players - is important

Note: SKU is an abbreviation of Stock Keeping Unit. It refers to the smallest unit used in inventory management, order making and receipt, etc.

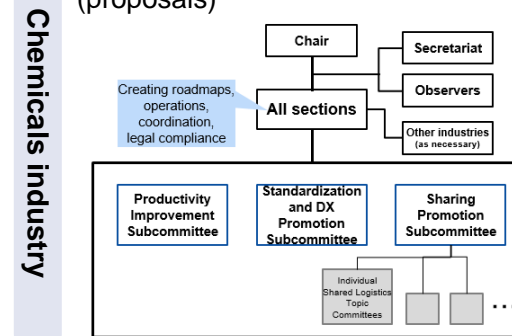
Source: Compiled by Mizuho Bank Industry Research Department

Current initiatives toward standardization and sharing by industry

Major research institutes founded in recent years

Food industry	Kyushu Logistics Research Institute (founded August 2022)	Retail: Aeon Kyushu, Ellena, SunLive, Seiyu, Tokiwa Industry, Trial Holdings, Nishitetsu Store, three others Transport: MLS, Muroo, Aeon Global SCM
	Greater Tokyo Supermarket Logistics Research Institute (founded March 2023)	Retail: Summit, Marutesu, Yaoko, Life Corporation
	Hokkaido Logistics Research Institute (founded May 2023)	Retail: Aeon Hokkaido, Seiyu, Trial Holdings, Hokuyu Lucky, around ten others

Chemicals working group structures (proposals)



- ✓ Formation of chemicals working groups
- ✓ Comprised of 59 organizations including chemicals manufacturers, logistics companies, and trading companies (as of August 2023)
- ✓ The working group secretariat includes Mitsubishi Chemical, Mitsui Chemicals, Tosoh, and Toray

Source: Compiled by Mizuho Bank Industry Research Department based on Ministry of Economy, Trade and Industry Physical Internet Delivery Committee materials, press releases and information disclosed by each company.

5. Medical

Need to identify required functions, enhance collaboration, and boost productivity through DX in local communities

<p>I. Supply and Demand Trends</p>		<p>(Short-term)</p> <ul style="list-style-type: none"> ■ Due to the continued aging of Japanese society and advancements in medical care, medical care expenditures continue to rise. Medical care expenditures rose 2.9% in FY2023 over the previous year and are forecast to rise 1.5% in FY2024 due to increased infections stemming from recovery from the COVID-19 pandemic and pandemic-related restrictions being lifted, as well as increased demand from the growing number of people aged 75 and over. <p>(Medium-term)</p> <ul style="list-style-type: none"> ■ Looking towards FY2028, although a decrease in the population aged 64 and under and factors such as the securing of a budget for measures to deal with the declining birthrate will continue to keep medical care expenditures down, the further aging of Japanese society and advancements in medical care are expected to cause a continued annual increase in medical care expenditures of 1.4%. ■ On the supply side, there will be a marked decrease in the working population, constraining supply from a personnel and fiscal standpoint.
<p>II. Topics</p>	<p>Competitive Environment</p>	<ul style="list-style-type: none"> ■ To achieve Community Health Care Visions, the government has implemented fiscal support and other measures to promote the consolidation of surplus acute care hospital beds and a shift to functions such as recovery phase care and home health care. Acute care beds are difficult to sustain and require an intensive allocation of physicians and nurses. At the same time, taking also into account the need to accommodate work style reforms for physicians from FY2024, the utilization of technology and other measures to boost productivity are needed. ■ There is a need to pay close attention to deliberations on the 8th Medical Care Plan, which will set the medium-term policy direction, among other matters, and to respond accordingly.
	<p>Risks and Opportunities</p>	<p>(Risks)</p> <ul style="list-style-type: none"> ■ While costs such as labor and utilities rise, the COVID-19-related financial support that has shored up hospital earnings has been scaled back, driving down revenues for health care facilities. Amid calls for post-COVID-19 management restructuring and functional enhancement, there is increased polarization of hospital management based on financial strength. ■ As the number of patients decreases and health care needs change, the number of hospital beds must be optimized, and functions must be reconsidered. <p>(Opportunities)</p> <ul style="list-style-type: none"> ■ The government is stepping up the promotion of health care digital transformation (DX), and health care facilities should promote the implementation of on-site DX using subsidies, etc.
	<p>Analyst's View</p>	<p>(Functional enhancement, collaboration, and greater DX are needed)</p> <ul style="list-style-type: none"> ■ There is a need to identify required functions and enhance collaboration based on Community Health Care Visions, etc., in local communities. As the population declines, the consolidation of medical care, long-term care, and welfare to comprehensively meet residents' needs must also be considered. ■ Under fiscal and labor constraints, technology and DX should be more actively implemented to enhance functions and boost productivity. ■ As hospital management grows more complex, companies that support hospital management will enter the spotlight.

Source: Compiled by Mizuho Bank Industry Research Department.

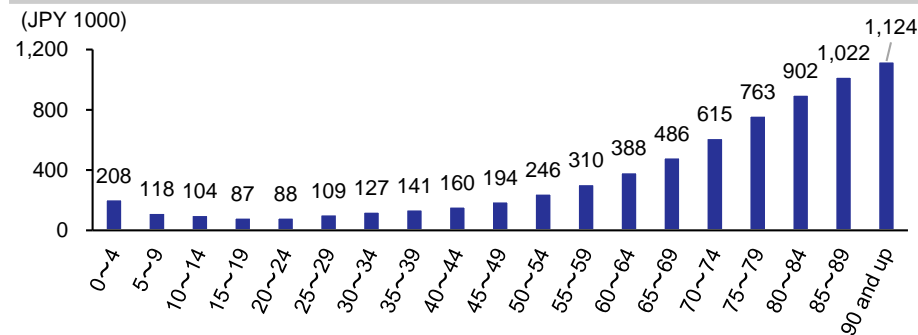
[Demand] 48.2 trillion yen in FY2023, expected to increase 1.4% annually towards FY2028

- The medical care market (national medical care expenditure; NME) was 48.2 trillion yen in FY2023 (+2.9% compared to FY2022) and is projected to be 48.9 trillion yen (+1.5%) in FY2024.
 - Although drug prices are lowered every fiscal year, medical care expenditures are rising because of the growing number of people aged 75 and over, among whom demand for medical care is high, and advancements in medical care. Due to increased infections stemming from recovery from the COVID-19 pandemic and pandemic-related restrictions being lifted in FY2023, further increases in demand are expected.
- Looking towards FY2028, despite growing pressure to tighten social welfare spending in light of the impacts of the shrinking population and unprecedented measures to deal with the declining birthrate, the further aging of Japanese society and advancements in medical care are expected to cause a continued annual increase in medical care expenditures of 1.4%.

Trends in NME

(JPY trillion)	FY2022 (expected)	FY2023 (expected)	FY2024 (forecast)	FY2028 (forecast)	CAGR 2023-2028
NME	46.8	48.2	48.9	51.6	-
Year-to-year	+4.0%	+2.9%	+1.5%	-	+1.4%

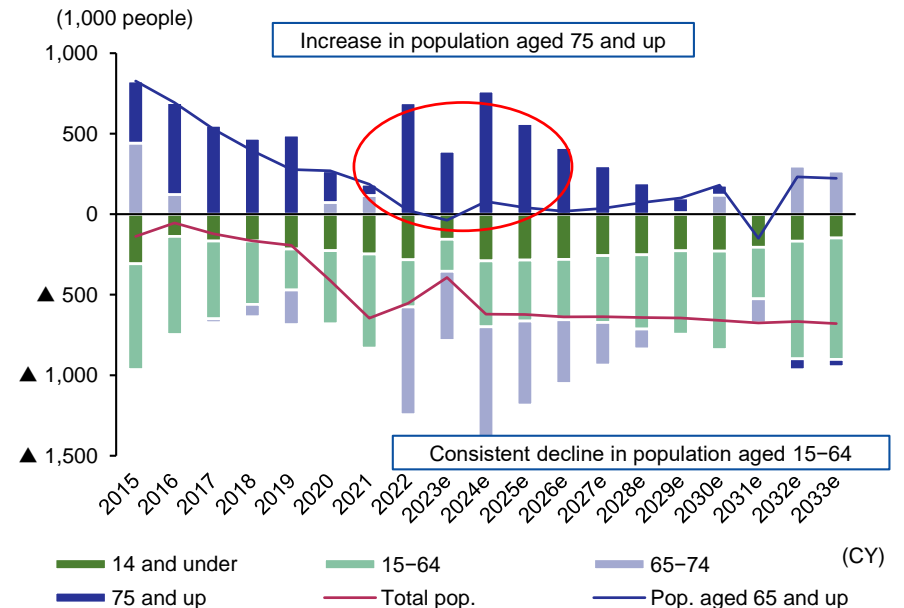
Per-capita NME by age group (FY2021)



Note: FY2022 number in upper figure is an estimation based on approximate medical care expenditures, while the FY2023 number is a projection by the Mizuho Bank Industry Research Department.

Source: Both figures compiled by Mizuho Bank Industry Research Department based on "National Medical Care Expenditure" and "Trends in Medical Care Expenditure" by the Ministry of Health, Labour and Welfare and from "Future Population Estimates for Japan" by the National Institute of Population and Social Security Research, etc.

Forecast of year-on-year population changes by age group



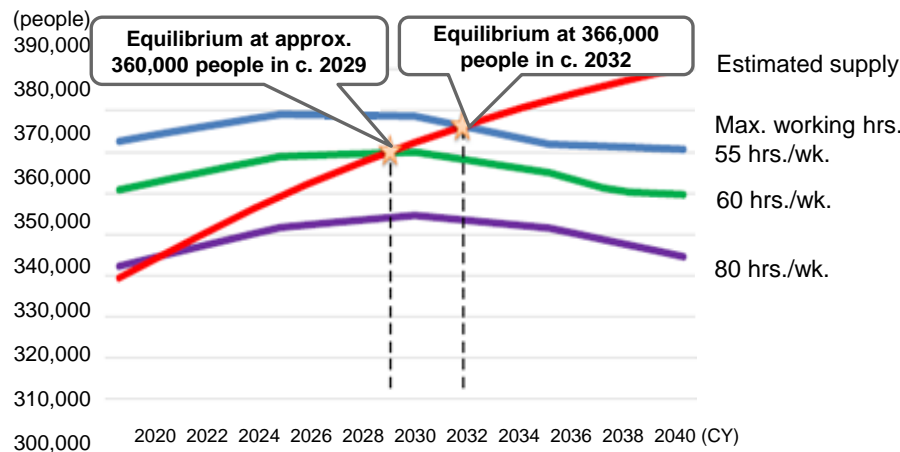
Note: Figures for 2023 onwards are estimates based on Statistics Bureau of Japan April 2023 population estimates.

Source: Compiled by Mizuho Bank Industry Research Department based on "Population Estimates" by the Ministry of Internal Affairs and Communications and "Future Population Estimates for Japan" by the National Institute of Population and Social Security Research.

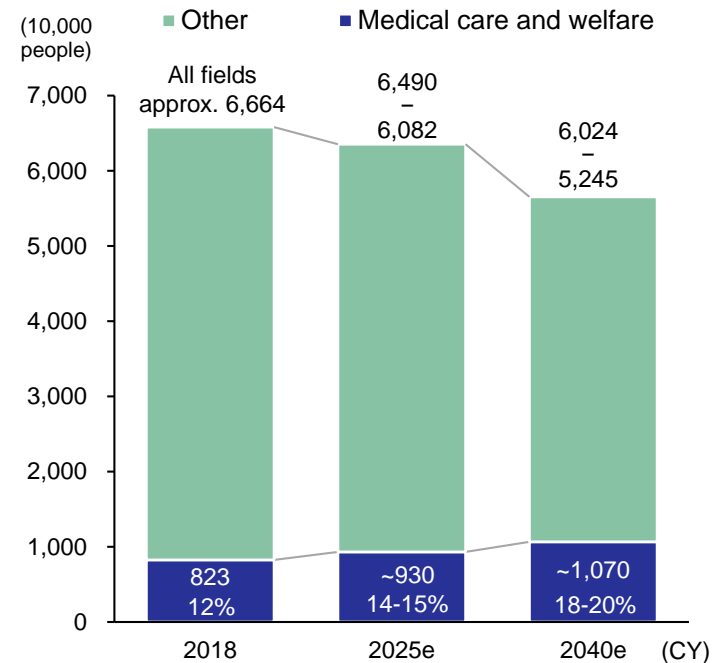
[Supply] Physician shortage continues, population decline constrains supply from both personnel and fiscal standpoint

- Estimates by the Ministry of Health, Labour and Welfare (MHLW) forecast a physician shortage until 2030 or so, even after which uneven distributions among regions and specialties are expected to persist. Due in part to work style reforms for physicians to take effect from April 2024, the inability to secure sufficient personnel could also constrain supply.
- Although the medical care and welfare field is expected to require greater numbers of employees, the working population will decline rapidly from 2025 onwards. A decrease in the working population also means fewer people to support the social security system, potentially leading to supply constraints from both a personnel and fiscal standpoint.

Doctor supply/demand forecast (MHLW estimates)



Employee number forecast



<Work style reforms for doctors> To take effect from April 2024

- ◆ Restrictions on overtime hours and mandatory health protection measures
- ✓ In principle, up to 960 hours/year or 100 hours/month (Up to 1,860 hours/year / 100 hours/month in certain cases such as university hospitals and emergency medicine)
- ✓ Penalties for violations

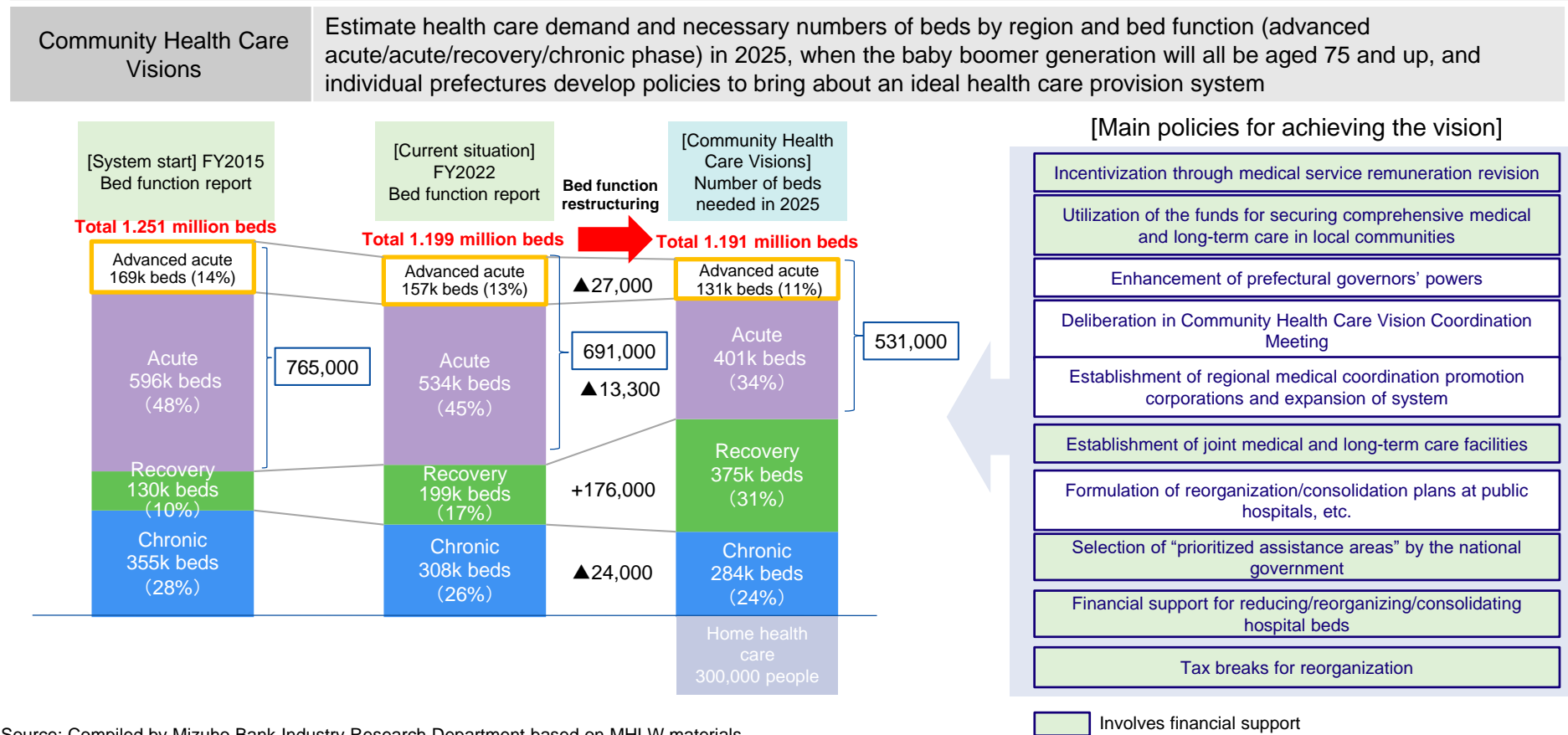
Source: Reprinted from MHLW Study Group on Health Care Professionals Supply and Demand Physician Supply and Demand Committee "2020 Physician Supply and Demand Estimate Results" materials.

Source: Compiled by Mizuho Bank Industry Research Department based on MHLW "On 'Summary by the Social Welfare/Labor Reform Headquarters View of 2040.'" materials.

Push to consolidate surplus acute care beds based on Community Health Care Visions, but progress slow

- In preparation for 2025, when health care demand will increase, MHLW is working to realize Community Health Care Visions aimed at optimizing the distribution of health care resources.
 - MHLW aims to consolidate acute care beds, which will likely become surplus to needs as the population ages, and to enhance recovery phase care and home health care, but progress is slow.
 - The government is supporting a shift to such functions by means such as raising the requirements for receiving medical service remuneration for acute care beds and providing financial support for bed reductions and related investments.

Vision of Health care provision system for 2025 (2025 model)



Source: Compiled by Mizuho Bank Industry Research Department based on MHLW materials.

Work style reforms to take effect in FY2024, raising importance of boosting productivity by utilizing technology, etc.

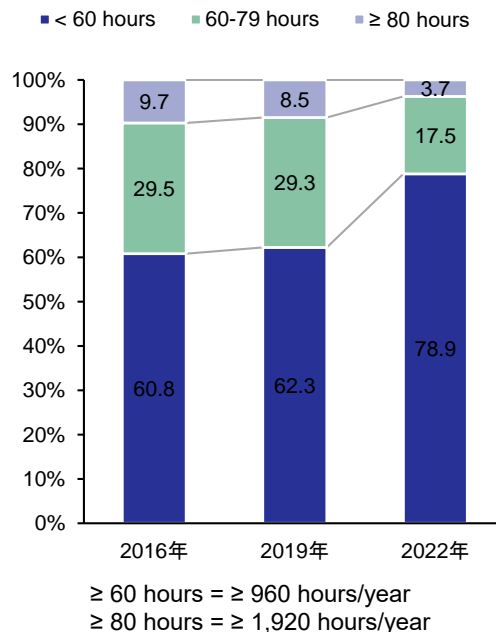
- Healthcare facilities are preparing for work style reforms for doctors set to take effect in April 2024. Working conditions for staff doctors are generally improving as a result.
- Preparing for work style reforms requires appropriate labor management and establishment of task-sharing/shifts, but with the population decreasing ever further, the utilization of technology is required as a fundamental measure.

Work style reforms for doctors (effective April 2024)

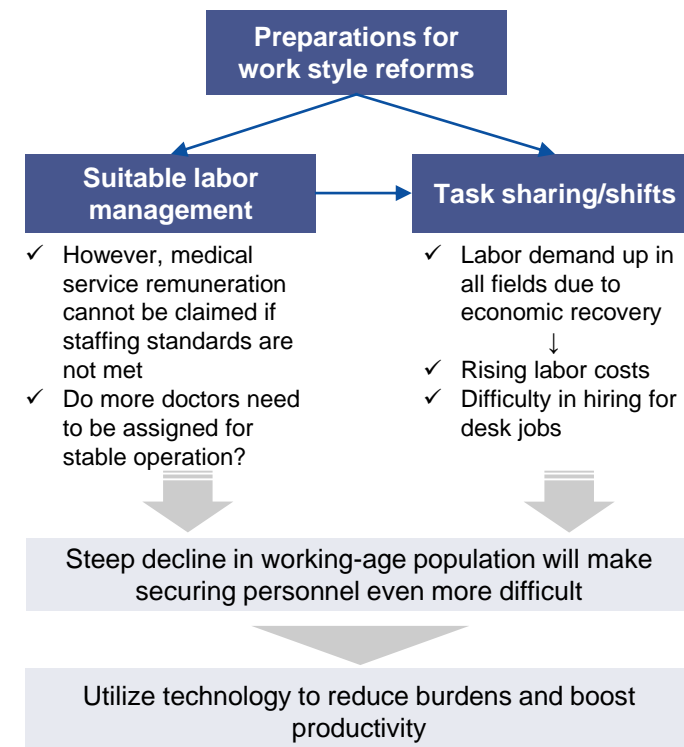
Levels applied to medical facilities	Maximum overtime hours
A (General medical facilities)	960 hours
B for Cooperation (Hospitals that dispatch doctors)	1,860 hours ★ Intended to be eliminated by the end of FY2035
B (Emergency medicine, etc.)	
C-1 (Clinical/specialist training)	1,860 hours
C-2 (Advanced skills training)	

- Excluding Level A, special levels must be set by prefectures.
- In addition to limiting overtime hours, measures such as health protection are also required.
- Violations will be penalized.

Survey of staff physician overtime (note)



Preparations by medical facilities for work style reforms for doctors



Note: Percentages add up to more than 100% due to rounding.
 Source: All figures compiled by Mizuho Bank Industry Research Department based on MHLW materials.

Need to pay close attention to deliberations on 8th Medical Care Plan, which will set medium-term policy direction, among other matters, and respond accordingly

- In FY2024, the 8th Medical Care Plan and other medium-term plans will be reexamined, and work style reforms for doctors will be implemented.
 - The COVID-19 pandemic highlighted dysfunction in the health care provision system and prompted discussion on redefining the functions of inpatient, outpatient, and primary care physicians.
- Health care professionals must pay close attention to deliberations on the formulation of the various plans and consider rapid responses with a medium-term view.

Processes for health care policy-related measures

	FY2022	FY2023	FY2024	FY2025	...	FY2030	...	FY2036	...	FY2040
Plan for securing comprehensive care	Discussion by the Meeting to Promote the Securing of Comprehensive Medical and Long-term Care in Local Communities	Coordination								
Medical service remuneration revision	★ Medical service remuneration revision		● Simultaneous revision ★		★★★	● Simultaneous revision	★★★	● Simultaneous revision ★	★	★
Medical Cost Optimization Plan	3 rd Medical Cost Optimization Plan (2018-2023)		4 th Plan (2024-2029)			5 th Plan (2030-2035)		6 th Plan (2036-2041)		
Medical Care Plan	Discussion and coordination by panels and working groups, revision of basic policies and drafting guidelines	Formulation of plans by individual prefectures	8 th Medical Care Plan (2024-2029)			9 th Medical Care Plan (2030-2035)		10 th Medical Care Plan (2036-2041)		
Community Health Care Visions (inpatient functions)	Community Health Care Visions (-2025)									
	<Discussion of and initiatives toward new Community Health Care Visions from 2025 onwards>		Deliberation and systematic response at the national level	Drafting by individual prefectures	Initiatives based on new Community Health Care Visions (2026-)					
Outpatient care/primary care physician functions	Preparations to conduct outpatient function reports (around Sep.)	Report implementation/aggregation (around Dec.)	Discussions in communities / announcement of referral medical facilities (around Mar.)	Formulation of outpatient care plans by individual prefectures	Outpatient care plan (8 th Medical Care Plan)		Outpatient care plan (9 th Medical Care Plan)		Outpatient care plan (10 th Medical Care Plan)	
	Identification of primary care physician functions and deliberation of specific policies to enable effective exercising of these functions for patients and physicians			Actions based on deliberation results						
Physician work style reforms	Surveys on medical facilities' preparation status and the impacts on community health care		Enacted beginning FY2024							
	Based on surveys, prefectures examine impacts on community health care at the area level and community health care personnel discuss and coordinate on securing community health care			Level (B): Considering gradual revision based on surveys, etc.					Scheduled to be eliminated by end of 2035	
				Level (C): Training, health care quality assessment, and medium-to-long-term consideration						

Source: Compiled by Mizuho Bank Industry Research Department based on MHLW materials.

Government strongly promoting medical DX, granting subsidies, etc., to support new IT systems at medical facilities

- The government is strongly promoting medical DX and established a “Headquarters for Medical Digital Transformation (DX) Promotion” headed by the Prime Minister in October 2022. In June 2023, the Headquarters announced a “Medical DX Promotion Work Plan.” Its goals include expanding networks of IT systems such as online confirmation of certifications and, in FY2024, expanding electronic prescriptions and building an electronic medical record information sharing service (name TBD).
- Challenges for achieving medical DX include introducing new IT systems at medical facilities, encouraging the public to obtain Individual Number Cards, and registering such cards for use as health insurance cards. The government will support the prompt introduction of new IT systems at medical facilities with subsidies and medical service remuneration.
- As part of medical service remuneration revision DX, the FY2024 revision will be pushed back from the usual April 1 to June 1.

Specific policies and processes promoted by the Headquarters for Medical DX Promotion

	Summary	Main processes
Establishing a nationwide health care information platform	Expanding networks for systems such as online confirmation of certifications, and establishing a nationwide platform that enables the sharing/exchange of information such as health insurance claims, specific medical examination information, vaccinations, electronic prescriptions, municipal health checkup information, and electronic medical records	<ul style="list-style-type: none"> • April 2023: Introduction of online certification confirmation mandated in principle for medical facilities and pharmacies • Fall 2024: Health insurance cards to be discontinued • FY2024: Expansion of electronic prescriptions, building an electronic medical record information sharing service (name TBD) and expanding information sharing, sharing information at sites of emergencies, electronic submission of medical certificates and other documents in municipal procedures
Standardizing electronic medical record information etc.	Standardizing the format for health care information in electronic medical records Discussing standardization of electronic medical records Effective application of electronic medical record data in optimization of treatment, and effective application of AI and other new technologies in medical technology development and drug discovery	<ul style="list-style-type: none"> • Research conducted in 2023 on defining the necessary requirements for standardized electronic medical records, with development scheduled to begin in FY2024; consideration of measures to support introduction at medical facilities • 2030: Introduction of electronic medical records at basically all medical facilities
Medical service remuneration revision DX	Utilizing digital tools to greatly streamline medical service remuneration and the process of revising it, and aiming to make effective use of personnel with digital skills and reduce system operating costs, etc.	<ul style="list-style-type: none"> • FY2024: Improvement/provision of common master information and electronic points table • Provision of standardized receipt computers and electronic medical records • FY2024 medical service remuneration revision timing changed from April 1 to June 1 (drug prices revised on April 1)

Source: Compiled by Mizuho Bank Industry Research Department based on materials from the Cabinet Office “Headquarters for Medical DX Promotion.”

Rising costs, but decrease in COVID-19-related financial support; polarization based on financial strength continues

- Currently, rising utility costs, price hikes for pharmaceuticals and materials, and pay raises from economic recovery are driving down revenues for health care facilities. Furthermore, as factors such as advancements in health care, the promotion of team-based health care, measures to deal with infectious diseases, and efforts to ensure greater patient safety and cybersecurity lead to higher numbers of employees in hospitals, work style reforms for doctors could also lead to further increases in the number of personnel and, potentially, greater labor costs.
- However, financial support from COVID-19-related medical service remuneration and subsidies has been gradually reduced since October 2023.
- As management restructuring for a post-COVID-19 society takes place, there have been calls for functional enhancement/transition based on Community Health Care Visions, and for equipment/IT investment, etc., to boost productivity. However, construction costs remain high, and polarization of hospital management based on financial strength continues.

Structure of hospital income & expenditure

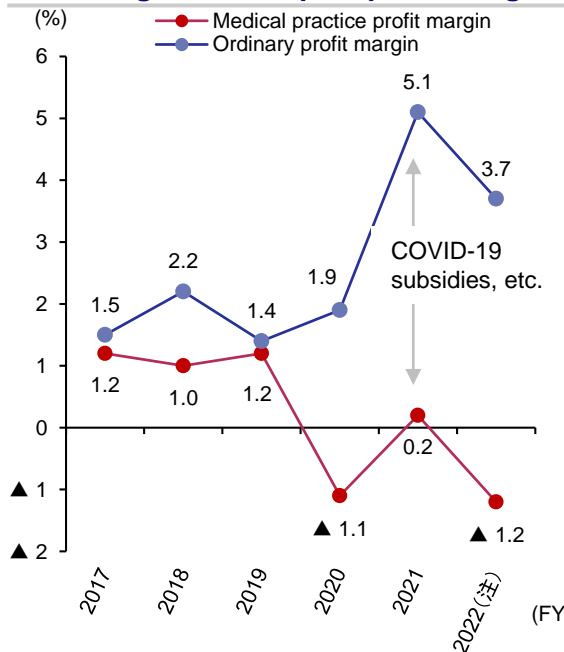
Totals for the 140 hospitals in the National Hospital Organization (FY2022)

Medical practice income	100%
Medical practice expenses	104%
Personnel costs	53%
Pharmaceuticals/materials	28%
(Pharmaceuticals)	(18%)
(Health care materials, meal ingredients, etc.)	(10%)
Facilities-related expenses	11%
Outsourcing expenses	6%
Other expenses	6%
(Utilities)	(3%)
Medical practice losses	▲4%

Note: Only medical care expenses in relation to medical care income and expenditure are recorded. COVID-related subsidies are not included.

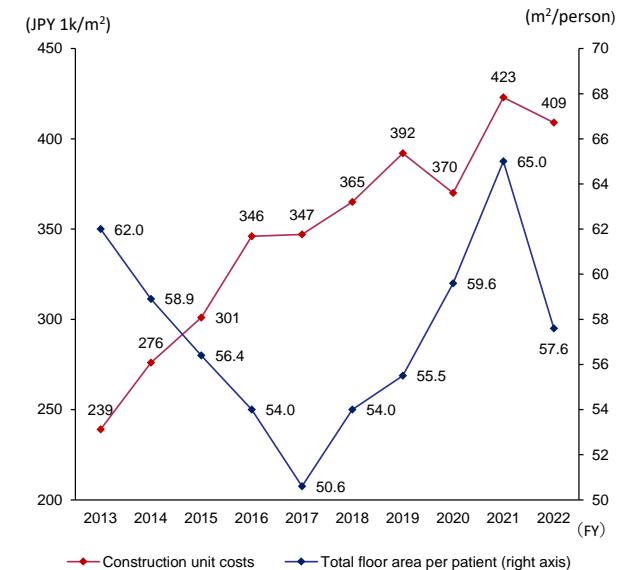
Source: Compiled by Mizuho Bank Industry Research Department based on National Hospital Organization materials.

Trend in general hospital profit margins



Note: Preliminary figures.
Source: Compiled by Mizuho Bank Industry Research Department based on Welfare and Medical Service Agency materials.

Trends in hospital construction unit costs & floor area per patient



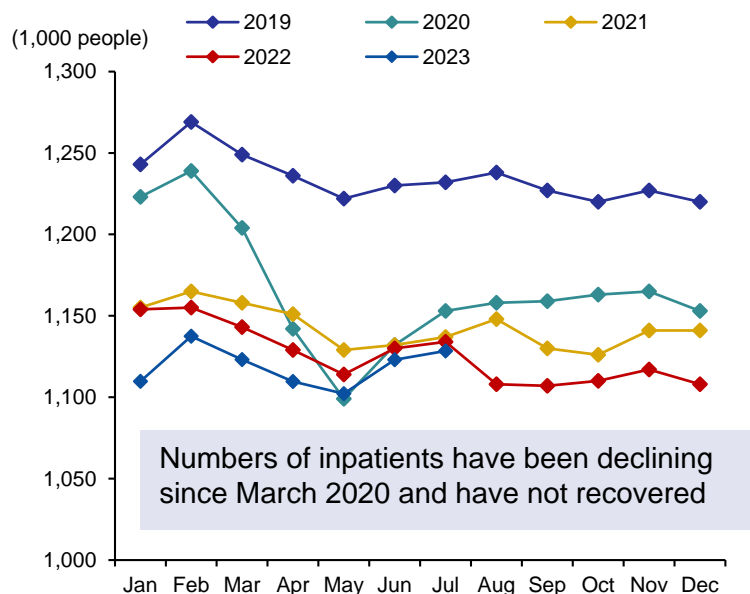
Source: Compiled by Mizuho Bank Industry Research Department based on Welfare and Medical Service Agency materials.

Reduction in hospital beds in response to lower numbers of inpatients, functional re-evaluation, and enhanced collaboration in communities urgently needed

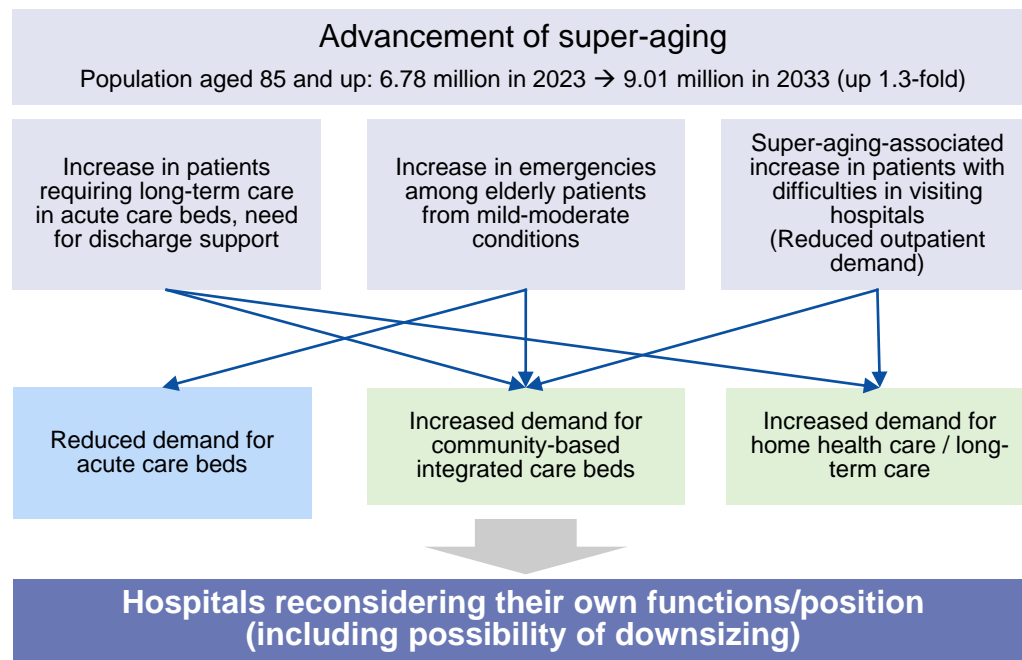
- Inpatient numbers, which decreased due to COVID-19, have not recovered despite COVID-19 being downgraded to the lowest category of infections. Shying away from examinations due to the pandemic and heightened home care needs may have brought about long-term changes in patient behavior.
- In addition to decreases in inpatients, hospitals face pressure to reduce the number of beds and reconsider their functions in response to changes in health care needs associated with the super-aging of the population. Another urgent issue for hospitals is collaboration with other health care functions and long-term care within the community. To make up for reduced demand, hospitals may need to develop new functions and revenue sources other than inpatient and outpatient care, such as home health care and preventive care.

Analyst's view

Trends in average daily numbers of hospital inpatients



Super-aging-driven changes in health care needs



Source: Compiled by Mizuho Bank Industry Research Department based on MHLW "Hospital Report."

Source: Compiled by Mizuho Bank Industry Research Department

Need to identify required functions, collaborate, and promote DX in local communities

- As the polarization of hospital management continues, hospitals must analyze their external and internal environments, identify the functions the community requires, and strengthen collaboration. With the population shrinking, offering a full lineup of services to comprehensively meet community residents' health care and long-term care needs would be a promising option for hospitals.
- That will require community cooperation, as well as DX initiatives aimed at improving the quality of health care and boosting productivity under labor constraints.
- One trend drawing attention is gradual network formation resulting from the separation of hospital management, which is becoming increasingly complex, from health care, with companies handling management support, DX support, and other responsibilities. In June 2023, CUC Inc., which provides hospital management support, was newly listed on the Growth Market. It is hoped that CUC will help make community health care more sustainable by leveraging its corporate knowhow to elevate hospital management.

Trends in strategies demanded of hospitals

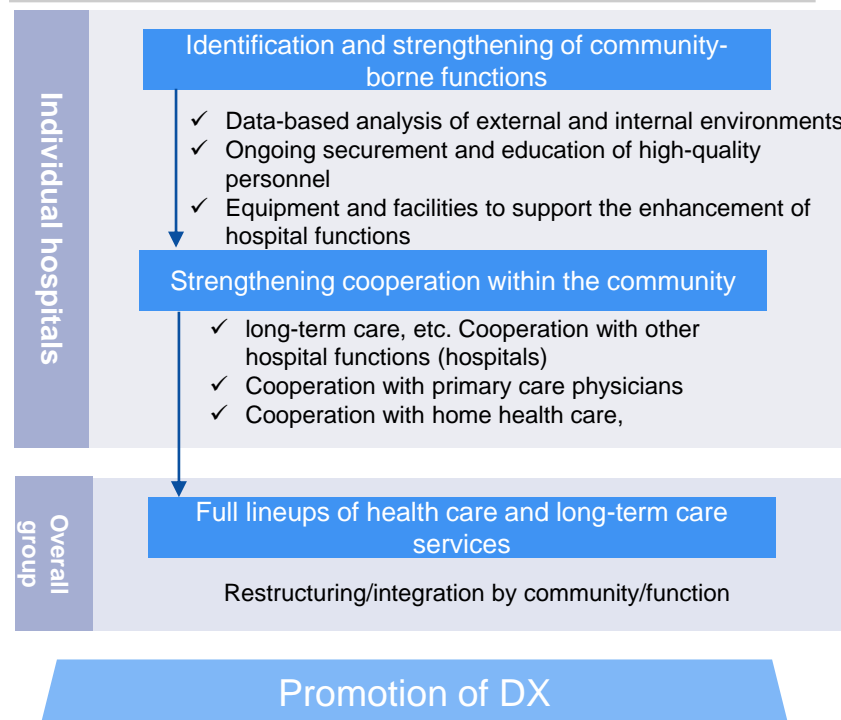
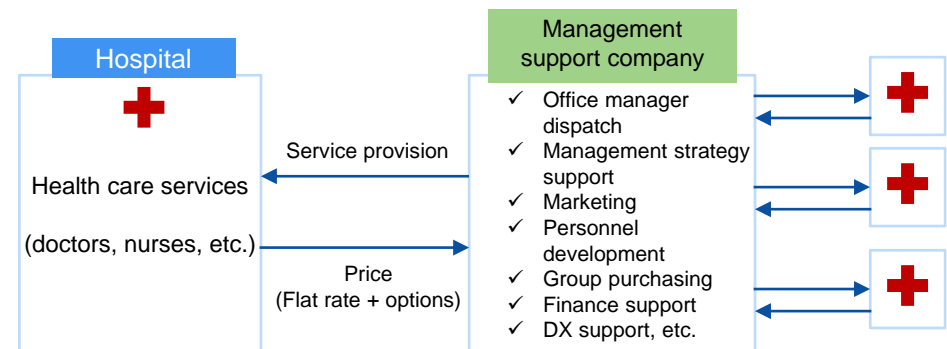


Image of hospital management support services



Major hospital management support service companies

Name	Group	Founded	Hospitals supported
CUC Inc.	M3	2014	N/A ^(note)
CHCP	Unison Capital	2017	11
Secom Medical System Co., Ltd.	Secom	2002	20
Eucalia Inc.	—	2005	23

Note: Number of hospitals not published, but total of 109 facilities including clinics, long-term care facilities, etc.

Source: Both figures compiled by Mizuho Bank Industry Research Department based on public information, etc.

Source: Compiled by Mizuho Bank Industry Research Department.

6. Nursing Care

Industry Reorganization Led by Major Operators Integrating Technology with Care that Supports Independence and DX in the Front-Lines

I. Supply and Demand Trends	<p>(Short term)</p> <ul style="list-style-type: none"> With the advance of the baby boomer generation into older age, an increase in service users and a rise in service unit prices are expected. For FY2023, care costs are projected to increase by 3.8% to 11.8 trillion yen compared to the previous year. For FY2024, an increase of 4.7% to 12.4 trillion yen is anticipated due to the implementation of the revised Long-Term Care Insurance, which incorporates improved wages and conditions. <p>(Medium term)</p> <ul style="list-style-type: none"> Post-FY2025, as growth of the elderly population slows down, market expansion is also expected to decelerate. Long-term care service expenses costs for FY2028 are predicted to rise at an annual rate of 2.6% to 13.4 trillion yen. The shortage of human resources is a chronic issue, and the decrease in the working population, which also serves as a financial source for insurance, is a medium to long-term challenge for the industry.
Competitive Environment	<ul style="list-style-type: none"> Progress of Reorganization <ul style="list-style-type: none"> Threat from sellers (constraints on business expansion): Human resource shortages, plus limited opportunities for new facility openings Threat from buyers (constraints due to the long-term care insurance system): Tightening of remuneration, need for enhancement of services Threat of substitutes: Threats posed by convenient monitoring and day-to-day life support services, as well as services to enhance health and prevent severe conditions Major companies are selling non-core nursing care businesses and leading operators are joining fund umbrellas
Risks and Opportunities	<p>(Risks)</p> <ul style="list-style-type: none"> There is an urgent need to improve conditions on the front lines through technology, and ICT utilization through subsidies is being promoted as a countermeasure to human resource constraints. However, small and medium-sized operators, who make up 60% of the industry, face challenges such as low cost-effectiveness, and there is a risk they will not make improvements in this area. <p>(Opportunities)</p> <ul style="list-style-type: none"> To ensure the sustainability of the Long-Term Care Insurance system, care that supports users to be independent and emphasizes outcome evaluations is being promoted, with insurers also driving this movement forward through incentives. Infrastructure development, such as digitization of records and information sharing on the front lines, is necessary. Major operators, with their strong investment capabilities, have the opportunity to pioneer this approach, aiming for higher evaluations in remuneration and increased ability to attract customers.
Analyst's View	<p>(Major nursing care operators beginning to develop AI for care that supports independence and DX in the front lines, producing the main axis of future reorganization)</p> <ul style="list-style-type: none"> Leading major nursing care operators are implementing advanced initiatives as part of their company-wide DX strategies. <ul style="list-style-type: none"> The Benesse Group is developing AI that learns from the implicit knowhow of veteran staff. This knowhow is used to help achieve care that supports users' independence. The SOMPO Group is making investments to enable the creation of AI-based plans for care that supports independence. The Gakken Group is revamping its operational infrastructure and implementing app-based improvements in workflow efficiency. These capital-rich, experienced, major operators are potent bearers of DX in nursing care. The increasing presence of these technologies in the industry is likely to become the main axis of industry reorganization.

Source: Compiled by Mizuho Bank Industry Research Department

Demand: Projected to Increase 4.7% on the previous fiscal year to 12.4 trillion yen in FY2024, and 13.4 trillion yen in FY2028

- Since 2022, the baby boomer generation has continued to advance into latter-stage older age. For FY2023, the market (long-term care service expenses) is expected to reach 11.8 trillion yen, a 3.8% increase from the previous year, due to an increase in the number of service users and a rise in service unit price.
- For FY2024, in addition to the increase in service users, the market is predicted to reach 12.4 trillion yen, a 4.7% increase from the previous year, due to a revision providing improved wages and conditions for nursing care employees.
- Post-FY2025, as growth in the latter-stage elderly population slows down, market growth is also expected to decrease, with the market for FY2028 predicted to be 13.4 trillion yen, a 2.6% annual increase from FY2023.

Trends in Long-Term Care Service Expenses

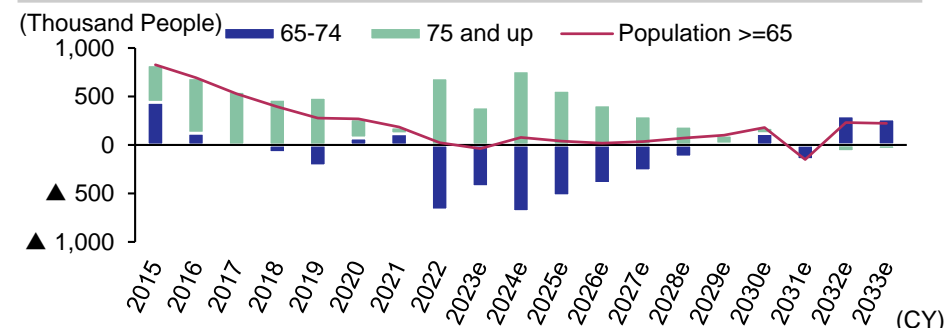
	2022 (forecast)	2023 (forecast)	2024 (projection)	2028 (projection)	CAGR 2023-2028
Long-term care service expenses (trillion yen)	11.4	11.8	12.4	13.4	-
YoY	+0.8%	+3.8%	+4.7%	-	+2.6%
Elderly population (10,000 people)	3,624	3,620	3,628	3,644	-
YoY	+0.1%	-0.1%	+0.2%	-	+0.1%
Of which, latter-stage elderly (10,000 people)	1,936	1,976	2,052	2,199	-
YoY	+3.7%	+2.0%	+3.9%	-	+2.2%
Number of people requiring long-term care (10,000)	694	704	719	780	-
YoY	+0.7%	+1.4%	+2.1%	-	+2.1%
Aging rate	29.0%	29.1%	29.3%	30.0%	-

Note 1: The benefits of Long-term Care Service System include co-payments, high-cost long-term care service expenses, etc. FY2022 values are estimates of actual figures. FY2023 values onwards are predictions by the Mizuho Bank Industry Research Department

Note 2: Estimates from 2023 for the elderly population are predictions by the Mizuho Bank Industry Research Department based on "Population Estimates" from the Ministry of Internal Affairs and Communications (actual figures as of April 2023)

Source: Compiled by Mizuho Bank Industry Research Department based on "Population Estimates" from the Ministry of Internal Affairs and Communications and "Japan Population Projections" from the National Institute of Population and Social Security Research

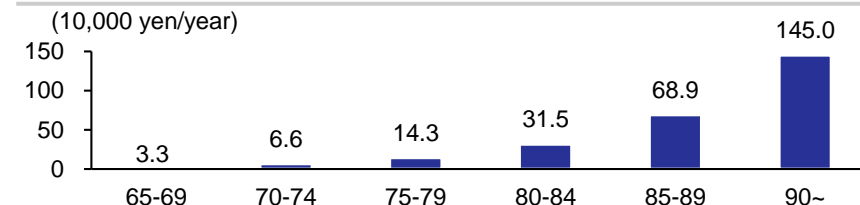
Forecast of YoY Changes in Elderly Population



Note: Estimates from 2023 are based on "Population Estimates" from the Ministry of Internal Affairs and Communications (actual figures as of April 2023)

Source: Compiled by Mizuho Bank Industry Research Department based on "Population Estimates" from the Ministry of Internal Affairs and Communications and "Japan Population Projections" from the National Institute of Population and Social Security Research

Per Capita Care Nursing Care Benefits by Age Group (FY2021)

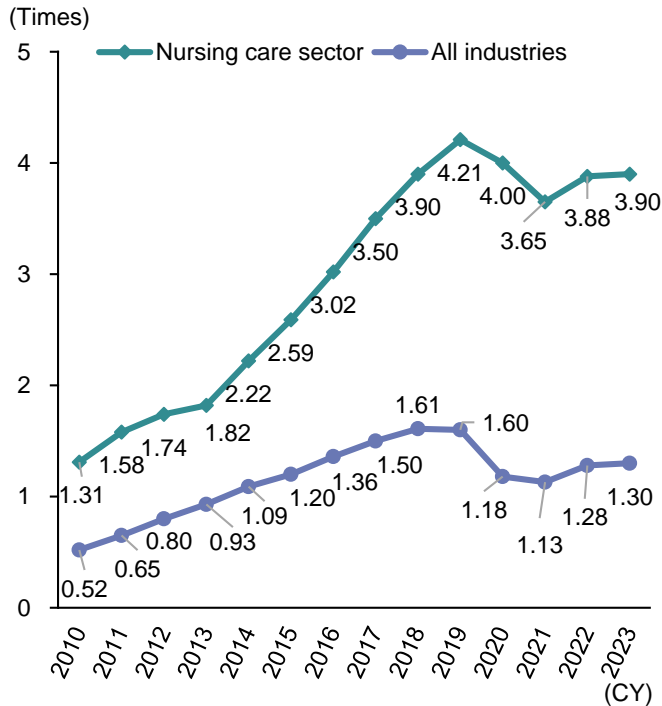


Source: Compiled by Mizuho Bank Industry Research Department based on Ministry of Health, Labour and Welfare materials.

Supply: Ongoing Chronic Shortage of Human Resources, with Concern Growing about Insufficient People to Support the Long-term Care Insurance System

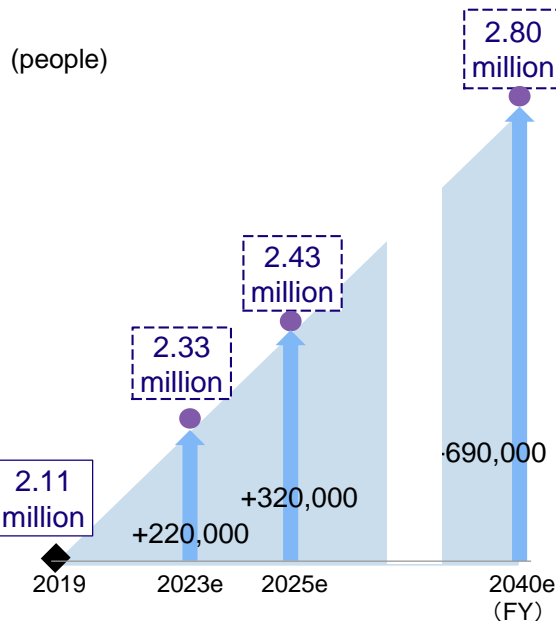
- The active opening rate to job applicants in the nursing care sector is significantly above the all-industries average, and the shortage of human resources remains chronic.
- The Ministry of Health, Labour and Welfare estimates that, compared to FY2019, an additional 320,000 nursing care workers will be necessary in FY2025 and an additional 690,000 workers in FY2040. In the social security field, the necessary number of workers in the health and welfare sector is also forecast to increase. However, the declining working-age population after FY2025 is expected to cause a rapid decrease in the available human resources, leading to concern growing not only about human resources but also about there being insufficient people to support financial resources for maintaining the Long-term Care Insurance System.

Trends in the active opening rate to job applicants



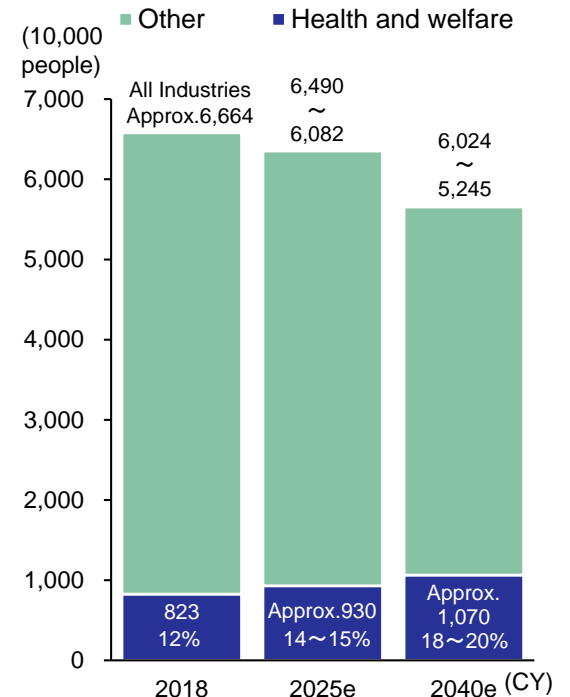
Note: 2023 uses the average value from Jan. to Aug.
Source: Compiled by Mizuho Bank Industry Research Department based on Ministry of Health, Labour and Welfare materials.

Necessary numbers of nursing care human resources workers



Note: Figures are estimates. Total number of necessary nursing care employees estimated by prefectural governments based on the forecast nursing care service volume in the Care Insurance Business Plan (FY2021 to FY2023), etc.
Source: Compiled by Mizuho Bank Industry Research Department based on Ministry of Health, Labour and Welfare materials.

Future outlook on number of workers (10,000 people)



Source: Compiled by Mizuho Bank Industry Research Department based on MHLW "On 'Summary by the Social Welfare/Labor Reform Headquarters View of 2040.'"

5 Forces: Industry Reorganization Progressing due to Human Resource Supply Constraints and Policy Trends, but Substitutes also a Threat

- Human resource shortages, constraints on opening new facilities, and policy guiding the industry towards reduced remuneration and enhanced services are producing increasing competition.
- The spread of non-publicly insured services such as monitoring, housekeeping, health enhancement, and services to prevent severe conditions are also a threat.

Supply Side

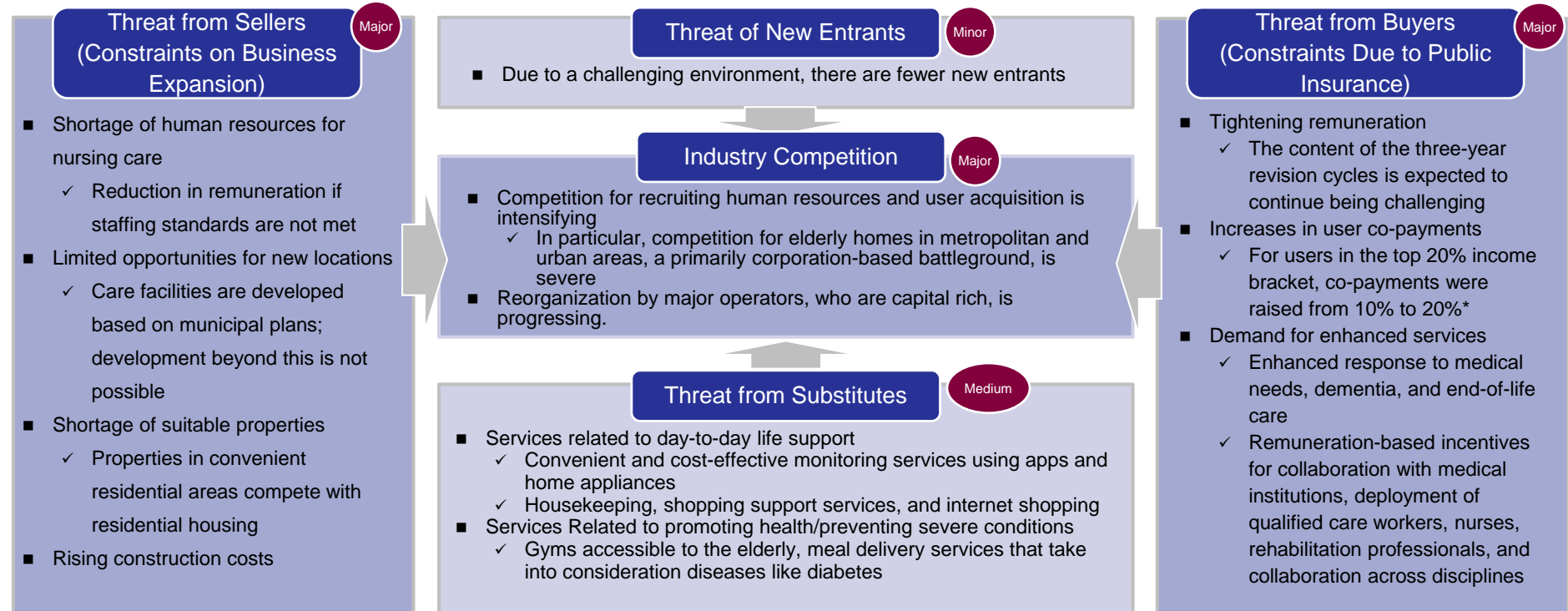
- Major constraints related to securing human resources and properties

Competition

- Although the rate of new industry entrants is slowing, competition within the industry is intensifying
- The spread of day-to-day life support services and services to enhance health and prevent severe conditions, which are ineligible for Long-Term Care Insurance, pose a threat.

Demand Side

- Progress is being made in revisions to remuneration and reviews to benefits and burdens to help ensure the system is sustainable



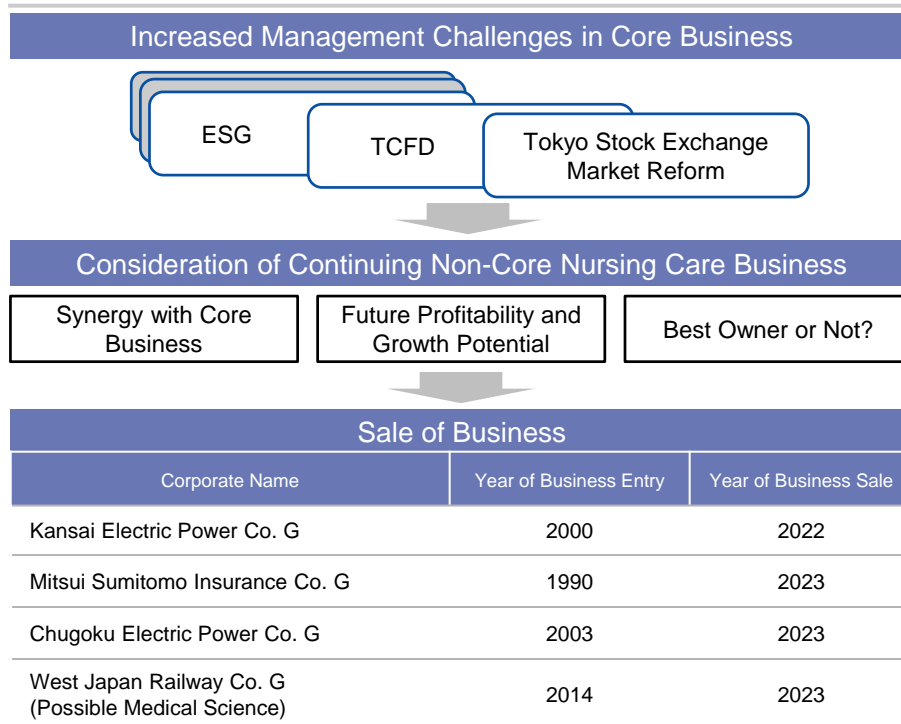
Note: Since 2015, users with a pension income of 2.8 million yen or more bear a 20% co-payment. Since 2018, this has been raised to a 30% co-payment for those earning 3.4 million yen or more.

Source: Compiled by Mizuho Bank Industry Research Department, based on publicly available information

Sales of Non-Core Nursing Care Businesses by Major Companies and Owner-Operated Firms Joining Funds

- Since the introduction of the Long-Term Care Insurance system in 2000, the market's growth potential and the stability of businesses supported by the insurance system lured major companies to enter the market. However, in recent years, these companies are reviewing and selling off their non-core nursing care businesses to concentrate management resources on more urgent business challenges, such as addressing Tokyo Stock Exchange market reforms and disclosing management strategies for climate change adaptation (TCFD).
- Furthermore, leading owner-operated companies, who have been in the care business since before 2000, are also moving to restructuring under funds, amidst increasingly challenging management environments and opportunities such as management succession.

Successive Sales of Non-Core Nursing Care Businesses



Source: Compiled by Mizuho Bank Industry Research Department, based on publicly available information

Major 4 Companies Go Private Under Funds

Operator Name	Business Entry	Fund Management Company	Acquisition under Fund Umbrella
Nichii Gakkan	1996	Bain Capital	2020
Tsukui	1983	MBK Partners	2021
UNIMAT Retirement Community (Now 'SOYOKAZE')	1997	MBK Partners	2023
Japan Long Life	1986	PMI Partners	2023

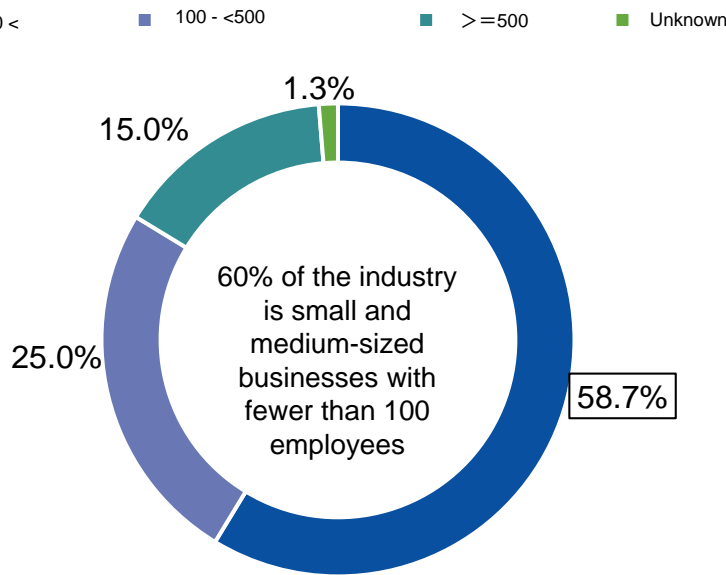
Note: On November 29, 2023, it was announced that Nippon Life Co. had agreed on November 28, 2023, to acquire Nichii Holdings Co., Ltd. The acquisition price is planned to be approximately 210 billion yen.

Source: Compiled by Mizuho Bank Industry Research Department, based on publicly available information

While the Use of ICT for Improving Productivity is Being Promoted, Small and Medium-Sized Operators Lag Behind

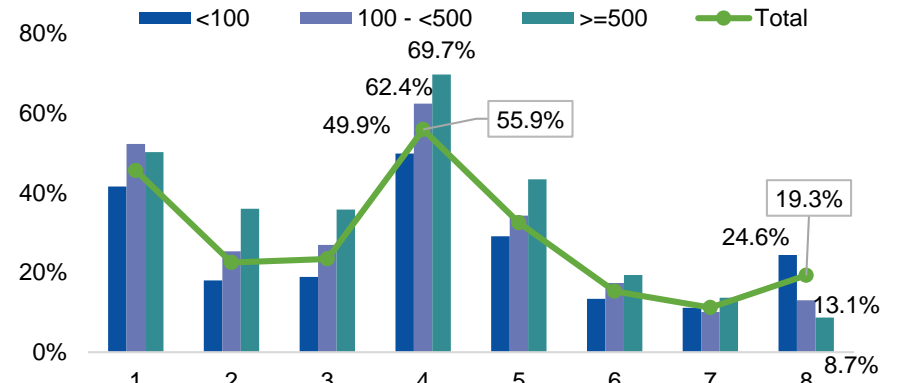
- As a solution to the challenges of human resource supply constraints, the government is aiming for a 5% productivity improvement on a per-hour service provision basis by 2040, promoting the use of various sensors, tablet devices, and other ICT equipment through subsidies.
- However, the majority of nursing care operators, consisting of small and medium-sized businesses, face challenges such as the high cost of equipment installation and management, the need for communication infrastructure, and limited efficiency improvements. Consequently, their use of such technology is low, and there is a high risk their productivity will not improve.
 - The rate of utilization of this equipment increases in proportion to the size of the operator. For instance, while the industry average for operators sharing user information via PC is 55.9%, it is 69.7% for operators with over 500 employees and only 49.9% for those with fewer than 100 employees.

Composition Ratio of Nursing Care Operators by Number of Employees (FY2022)



Source: Compiled by Mizuho Bank Industry Research Department based on an FY2022 survey of care labor by the Care Work Foundation.

ICT Utilization Status by Number of Employees



1. Managing everything from care service records to insurance billing systems.
2. Centralizing employee payroll calculations, shift and attendance management in a system.
3. Implementing field reports, communication, and consultations through groupware, etc.
4. Sharing user information (care plans, records, etc.) via PC.
5. Sharing user information via tablet devices, etc.
6. Collaborating with other operators using information sharing systems.
7. Implementing systems for data linkage with other operators, such as care plans.
8. Not implementing any of the above

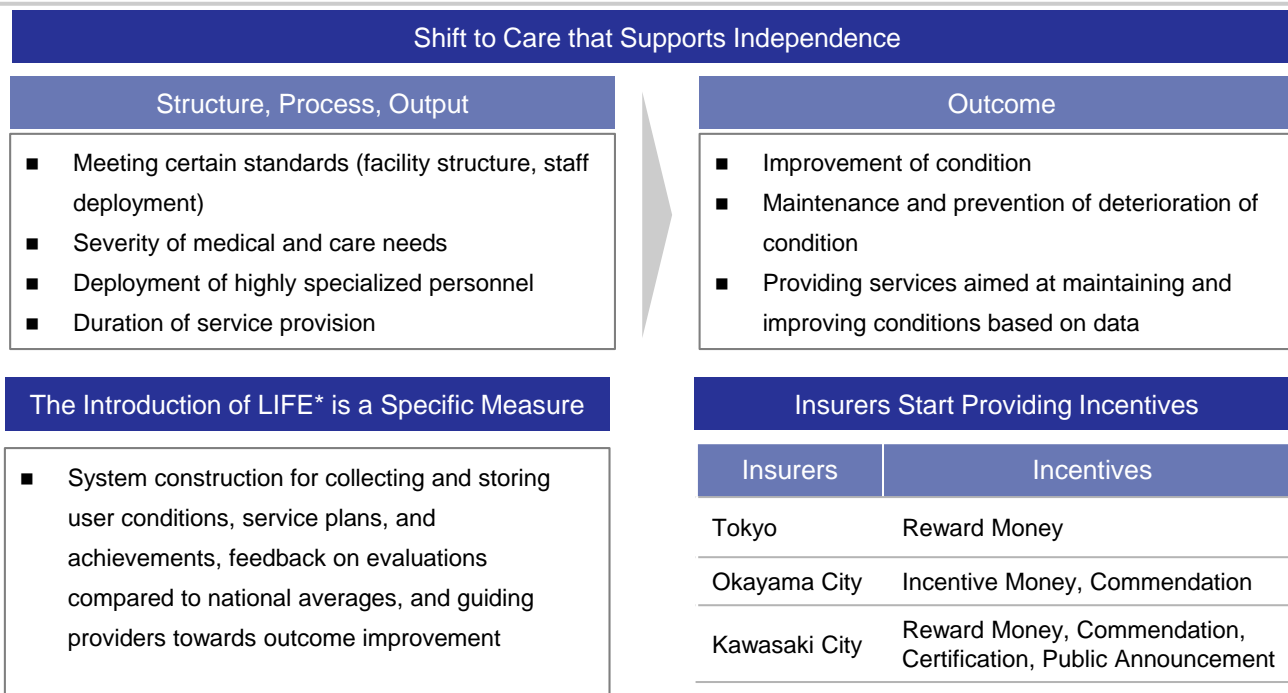
Source: Compiled by Mizuho Bank Industry Research Department based on an FY2022 survey of care labor by the Care Work Foundation.

Policy Shift to Care that Supports Independence: An Opportune Moment for Investment-Strong Major Operators

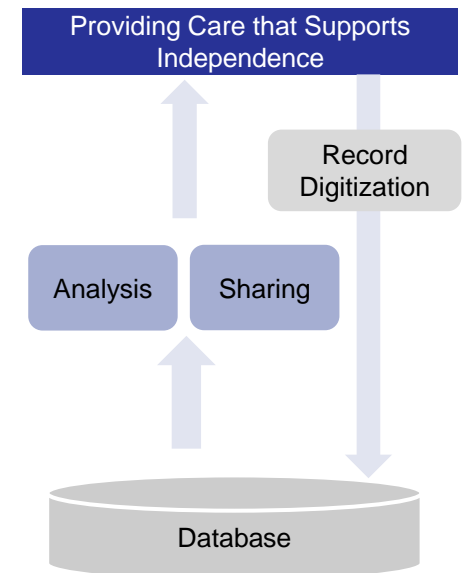
- To ensure the sustainability of the Long-Term Care Insurance system, the government is advancing a shift towards care that promotes independence amongst users and which evaluates improvements in outcomes such as maintaining or improving care conditions. As a part of this, the Long-term care Information system For Evidence (LIFE, see diagram below) has been introduced, which collects data on service plans and results from providers and provides feedback on evaluations. Furthermore, leading insurers are promoting care that supports independence among providers through unique incentives like reward money and commendations, and there is an expectation that activity in this area will increase going forward.
- The shift to care that supports independence is seen as an opportune moment for major operators with strong investment capabilities. Through infrastructure development, they can advance DX in-the-field, engage in providing services to support independence, and aim to achieve higher remuneration evaluations and increased customer attraction.

Analyst's View

Progression of Shift Towards Outcome-Focused Care that Supports Independence



Field-Level DX is Essential



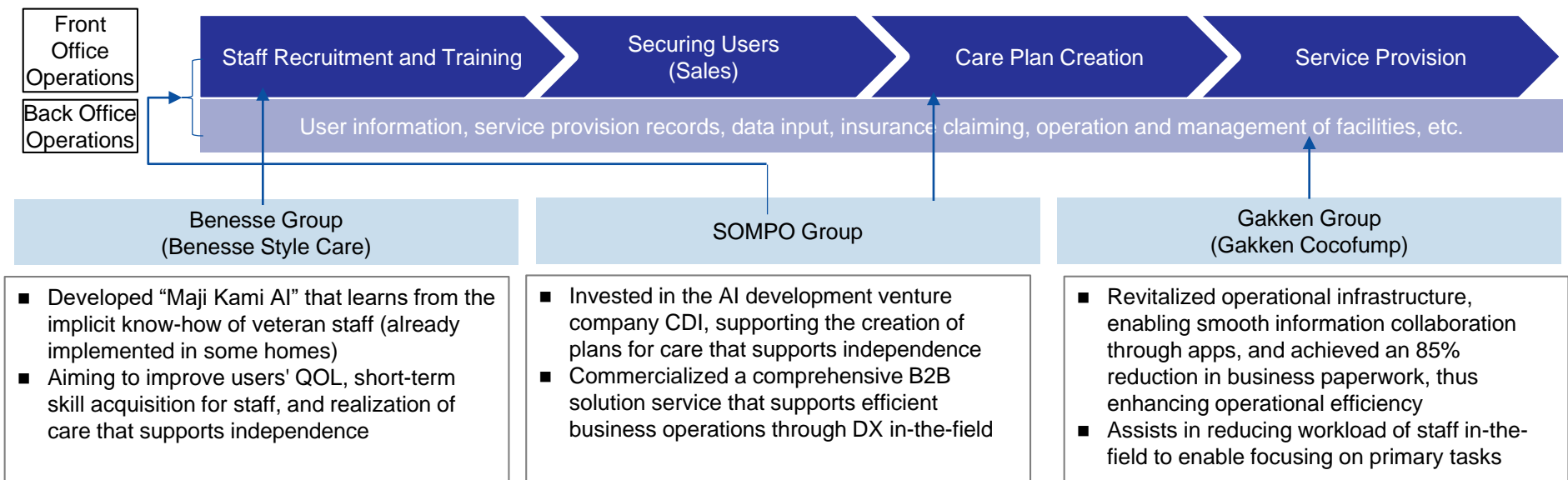
Source: Compiled by Mizuho Bank Industry Research Department, based on publicly available information

Note: Long-term care Information system For Evidence, introduced from 2021.
 Source: Compiled by Mizuho Bank Industry Research Department, based on publicly available information

Major Operators Become the Main Axis of Reorganization through Engaging in AI Development that Enables Care for Independence Support and In-the-Field DX

- Leading major nursing care operators are implementing advanced initiatives as part of a company-wide DX strategy.
 - The Benesse Group is developing AI that learns from the implicit knowhow of veteran staff
 - The SOMPO Group is making investments towards creating AI-based plans for the services that supports recipients independence
 - The Gakken Group, through investment in updating its operational infrastructure, has achieved smooth information collaboration and significantly improved operational efficiency
- Major operators equipped with the capital power to enable AI development, and with in-depth knowledge of the field, are seen as powerful bearers of DX in care. These operators are increasing their presence and are expected to become the main axis of reorganization.

Major Operators' Initiatives - AI Development for Care that Supports Independence and On-Site DX Transformation (Our Bank's Understanding)



Source: Compiled by Mizuho Bank Industry Research Department, based on publicly available information

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