(Provisional Translation)

Third Report
of the Committee on New Direction of
Economic and Industrial Policies

June 2024

Committee on New Direction of Economic and Industrial Policies, Industrial Structure Council

Ministry of Economy, Trade and Industry

(Provisional Translation)

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Ⅰ. Introduction

1. Necessity to compile the third report of the Committee on New Direction of Economic and Industrial Policies

- The Japanese economy continues to undergo the major changes (heightened geopolitical risks[1], global inflation[2], structural labor shortages[3], etc.) noted in last year's Second Report. Uncertainty continues to increase due to the protracted situation in Ukraine as well as the worsening situation in Israel and Palestine. These changes in the macroeconomic environment, combined with the strengthening of policy measures, have resulted in "turning points" in Japan, with private-sector capital investment[4] reaching 100 trillion yen for the first time in 30 years and wage increases[5] exceeding 5% in the spring wage negotiation, well above the level of the previous year. In this economic environment, the Bank of Japan raised interest rates for the first time in 17 years, reversing an eight-year negative interest rate policy[6].
- The continuation of change on turning points represents a once-in-a-lifetime opportunity to shift to a "growth-oriented economy in which investment, wages, and prices all grow," and to ensure it is necessary to structurally transform Japan into a new economy and society in the midst of positive challenge.
- On the other hand, facing the first change in 30 years, there is a mix of bullishness and bearishness among the business community and the public.
- To move from the stability and stagnation of the status quo to the change and revitalization of structural transformation, the public, including the business community, must share a medium- to long-term and big-picture perspective, encourage positive challenges, and ignite the animal spirits of the business community.
- In order to dispel the pessimism that is spreading in Japan about the future due to the declining population, and to encourage companies and individuals to take on positive challenges from a long-term perspective and to foster expectations for the future of Japan, we will present the future outlook for Japan in 2040, when each individual will be prosperous, and the measures we have taken since the Second Report to achieve this goal. The report also outlines the progress of the measures that have been taken since the Second Report, as well as measures that will need to be considered in the future.
- The view that prices and wages will not rise and the pessimism about the future that has taken root over the past 30 years will not be easily dispelled by developments only in the past two years. This is the critical moment for the government to take action so that it does not become complacent, miss an opportunity, and end up in the same situation as it was before. Based on this recognition, the Ministry of Economy, Trade and Industry (METI) will further develop and maintain proactive industrial policies, including fiscal policies, to encourage domestic investment in solving social issues that will generate future "Bread and Butter," and will demonstrate its strong determination to enhance the predictability of the future through this Third Report.

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1 See Reference Materials P3, P4
2 See Reference Materials P7, P8
3 See Reference Materials P6
4 See Reference Materials P11
5 See Reference Materials P13
6 See Reference Materials P7

2. Definition of this report

(Positioning of Third Report in New Direction of Economic and Industrial Policies)

- Since the General Meeting of the Industrial Structure Council in 2021, the Ministry of Economy, Trade and Industry (METI) started to examine measures to strengthen industrial policy as "New direction of Economic and Industrial policies", based on the reflection on domestic situation and the global trend.
- In June 2022, the first report of the committee positioned the lack of corporate investment as a factor in Japan's economic stagnation and proposed a broad framework for attracting investment. Specifically, ①the sector of solving social issues should be regarded as an engine of growth and be sustained over the medium to long term (at least 5–10 years) under the framework of "Mission-oriented industrial policy" + "Updating socioeconomic operating-system (OS)," and ②all kinds of policies including subsidies, taxation systems, regulation and standardization should be mobilized on a large scale, long-term, and planned manner in implementation of the strengthened industrial policy. In line with this framework, for example, the following measures will be implemented: Advancement of a growth-oriented carbon pricing concept, including upfront investment support to the area of climate transition in the amount of 20 trillion yen under the GX Promotion Act; Strengthening support for the semiconductor sector under the revised 5G Act; Formulation and implementation of a 5-Year Plan for Startup development, support reskilling 1 trillion yen, economic measures including supporting domestic investment 7 trillion yen under the FY2022 economic stimulus package.
- In June 2023, the second report of the committee further developed the basic ideas of the First Report, and subsequently expanded the strengthening of industrial policy to include government-wide efforts. Specifically, ①"expansion of domestic investment" and "rising wages" were positioned as turning point from the lost 3 decades due to the combination of changes in the macro environment and policy shifts, and ②in order to link these to sustainable growth, the reform of missions and operating systems, which were defined as the New Direction of Economic and Industrial Policies, were reorganized into eight missions and five operating systems, and efforts were strengthened. By doing so, the company positioned the realization of a "positive cycle of domestic investment, innovation, and income growth" as its goal. Under the leadership of Prime Minister Kishida, the "Public-Private Partnership Forum on Increasing Domestic Investment" was held several times, and it was agreed that the public and private sectors would work together to achieve the target of "115 trillion yen in domestic investment in FY2027," as stated by the Japan Business Federation (Nippon Keidanren), and a compilation of the government's measures and projects of 11 Ministries and Agencies as the "Domestic Investment Promotion Package[7]," a compilation of more than 200 measures from 11 ministries and agencies as the "Leading Medium Enterprises Growth Promotion Package[8]," a compilation of 190 measures from 12 ministries and agencies and 18 selected measures from among them, were also compiled.
- The Third Report clarifies that behind the changes lie turning points in the world's history, and that there are global structural changes that require a different approach. In our view, rather than a vision that represents a discontinuous ideal, we will formulate a single Future Outlook that is feasible as an extension of "the New Direction of Economic and Industrial Policies".

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[7] See Reference Materials P84, P85, P86

[8] See Reference Materials P89

- In addition, this report will also include ①the progress of the policies that have been worked on since the second report, and ②measures that will need to be considered in the future, based on the progress made.
- In this report, the first step is to present a scenario that provides a qualitative sense of direction as a premise. Based on the presented Future Outlook, we will work on quantification in cooperation with RIETI (Research Institute of Economy, Trade and Industry) and others in FY2024.

(Characteristics of the Future Outlook)

- The Future Outlook described in this report are not "idealized visions" that show how things should be in a discontinuous manner, as METI has shown in the past, but are feasible through efforts that are an extension of "the New Direction of Economic and Industrial Policies" already shown in the Second Report, etc.
- The Future Outlook is not definitive, but rather a starting point for discussions, policies, and actions that will continue over the medium to long term, and it will be revised and updated as necessary (positioned as ver. 1.0 only).

3. Structure and contents of this report

(Structure of this report)

- This report consists of a chapter dealing with Future Outlook ("II. A Future Outlook around 2040 (For Future Japan in which each Individuals will enhance well-being)") and a chapter dealing with measures ("III. Past and ongoing Measures for Future Japan in which each individual will enhance well-being"). In Section II, the future outlook for a prosperous Japan for each and every individual will enhance well-being for the year 2040. Section III presents ①the long-term goals set in the Second Interim Program, ②a summary of the progress of measures that have been taken since the Second Interim Program, and ③measures that need to be considered in the future.

(Structure and Contents of Ⅱ. A Future Outlook around 2040(For Future Japan in which each Individuals will enhance well-being))

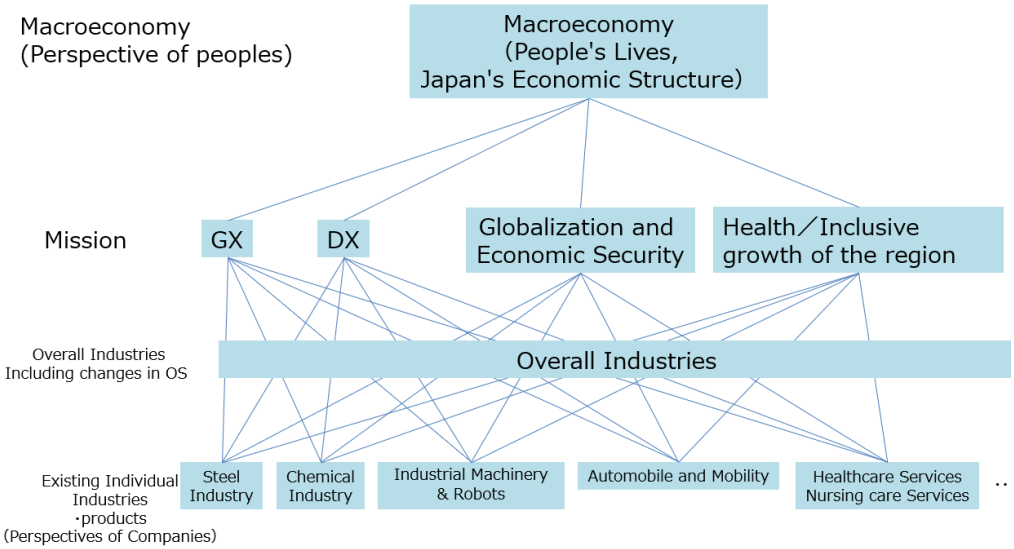
- In each part of the Future Outlook, ①changes in the demand structure and ②changes in the supply structure are depicted as objective future outlooks, which, if considered objectively based on the current situation and naturally expected future events, will result in the following picture around 2040. ③Changes in Japan's business structure is a subjective outlook, and although there are challenges in the current situation, it is depicted as something that can be achieved through efforts that include policies based on New Direction of Economic and Industrial Policies.
- In "II-1. Premises and Introduction of the Future Outlook," we describe two assumptions: "changes in the international economic order" and "changes in global demographic trends," which are the turning points of the era the world will face in the future when looking ahead to around 2040. In response to these changes, we present a future macro picture of the Japanese economy that can be divided into two cases:①Japan proceeds with the same economic and corporate management as it has in the past, and ②Japan proceeds with the approach presented in New Direction of Economic and Industrial Policies.
- In "II-2. The Future Outlook of 5 themes of Mission-oriented Industrial Policies," the five missions

extracted from the missions and operating systems organized in the second report (realization of a carbon-neutral society (GX), realization of a digital society (DX), realization of globalization and economic security (Globalization and Economic Security), realization of a new healthy society (Health), and inclusive growth of the region that contributes to coping with a declining birthrate), ①the global demand structure, ②the global supply structure, and ③changes in Japan's business structure.

- In "II-3. Changes in overall Industries," we envision simultaneous and integrated efforts to resolve the above extracted missions. The overall picture shows what new demands will be created and how the industrial structure will change (reorganize) around the world and in Japan in the future.
- In "II-4. Changes in Existing Individual Industries," we describe for each individual industry the ①changes in demand structure, ②changes in supply structure, and ③changes in Japan's business structure that will result from each of the five missions. As the premise is that the Future Outlook is described as an extension of New Direction of Economic and Industrial Policies, the Future Outlook for individual industries is drawn based on the industrial classification underfoot, rather than envisioned based on the industrial classification that could exist in the future.
- In "II-5. Challenges to achieve future Japan in which each individual will enhance well-being and the results of challenges," the challenges that should be addressed by companies, peoples, and the government to realize a society where every individual enhance well-being are summarized from the perspectives of ①expansion of domestic investment, ②accelerating innovation/replacement of industries, ③income growth, and ④Macroeconomic perspectives. As a future after overcoming these challenges, we will describe a picture of the future of people's lives and Japan's economic structure.

(Image：Structure of the Future Outlook)

Structure of the Future Outlook



(Structure and Contents of Ⅲ. Past and ongoing Measures for Future Japan in which each Individuals will enhance well-being)

- In "Ⅲ-1. Proposed Main measures to realize a positive cycle of domestic investment, innovation and income growth," based on the future necessary challenges described in the scenario, from the three perspectives of ①expansion of domestic investment, ②accelerating innovation/replacement of industries, and ③income growth, The major policy tools to be addressed in the future are shown below.
- In "Ⅲ-2. Past and ongoing sector-specific measures," based on the Future Outlook described here, the eight missions and four operating systems[9] that were reorganized by integrating globalization and economic security are summarized as follows: ①Long-term goals set in the Second Report, ②Progress of measures that have been undertaken since the Second Report, and ③Progress of measures that need to be considered in the future.

[9] See Reference Materials P31

Ⅱ. A Future Outlook around 2040(For Future Japan in which each Individuals will enhance well-being)

1. Premises and Introduction of the Future Outlook

(1)Recognition of "The world around 2040" as Assumption of the Future Outlook

(Premises and Introduction of the Future Outlook:"Turning of eras" behind the "turning points")

- In describing a "Future Outlook" around 2040 of the above-mentioned, METI would like to position the "turning points" as the very beginning of a historical shift, i.e., the change underlying the change is not merely transient, but a shift in the fundamental trend of the world that will continue (a shift in the times). In other words, the underlying change is not merely transient, but historic turning points of global trends that will continue. Specifically, ①changes in the international economic order that is based on "heightened geopolitical risks" and ②changes in global demographic trends leading to a "labor shortage".

(Premises and Introduction of the Future Outlook①:Changes in international economic order)

- For the past 30 years since the end of the Cold War, the international economic order has basically been the era of globalization, in which the boundaries between borders were lowered as much as possible and free trade and economic cooperation were expanded. This was ensured by the structure of world leadership by the U.S., which has outstanding national power.
- On the other hand, in the international economic order of the future, various political and economic systems, such as liberalism and authoritarianism, will flourish, and while there will be no return to a single U.S. power, the situation will continue to be highly uncertain due to increasing tensions between different political and economic systems. Industrial policies will be taken for granted, including in developed countries, against a backdrop of increasing global uncertainty and demands to address social issues such as climate change that cannot be addressed by the private sector alone. Japan, a place with relatively low uncertainty, has been an important place for supply-chain by global companies under diverse political and economic regimes from a geopolitical and geoeconomic perspective.
- As a trend that has not changed in the past, both governments and companies in developed and emerging economies will continue to seek to capture growth in the Global South and other regions where future income growth is expected. However, the Global South will still be a middle-income country in most countries around 2040.

(Premises and Introduction of the Future Outlook②:Changes in global demographic trends)

- With the exception of the U.S. and the Global South, many high-income and quasi-high-income countries, including Japan, major developed countries such as Europe, China, and East Asian countries, have entered a phase of declining population[10], and the linkage between population growth and economic growth has inevitably declined worldwide.
- Therefore, the mainstream of economic growth in many countries is to "aggregate demand will increase through enhancing productivity and demand per capita by adding high values".
- In addition, unlike population decline due to epidemics, famines, and conflicts, the proportion of the elderly, who are the main source of demand, will increase relatively during the phase of population decline due to aging and falling birthrates, and the working population, which is responsible for

[10] See Reference Materials P14

supply, will decline at a faster rate than the overall population decline, which is responsible for demand. Therefore, over the medium to long term, such as the next 30 years, it will become structurally easier for "demand will exceed supply" to occur, and the pressure on inflation globally[11] will persist throughout the world.

- In Japan, in particular, the labor participant rate is about to be reaching its peak due to the labor participation of women and the elderly over the past decade or so, and there is limited room for further increases in "labor input" through new labor participation[12]. In other words, the fastest demographic change in the world has created an environment of structural "demand will exceed supply" the pressure on inflation globally, and this environment will continue even around 2040. This has had and will continue to have a positive impact on wages and investment.

(Premises and Introduction of the Future Outlook：Summary)

- To summarize the above, both changes in the international economic order and changes in global demographic trends are major trends that will continue until around 2040 (or later), and will positively affect "domestic investment," "innovation," and "income growth" in Japan. In presenting the "Future Outlook" described below, we would like to share this assumption.

(Supplemented Note①：How inflation and deflation affect innovation)

- In a sustained inflationary environment, it is natural for companies to secure customers while raising prices. Therefore, it becomes reasonable for companies to implement creative investment as a business strategy, such as ①willingness to invest upfront in anticipation of increased sales due to higher prices, and ②development of new products and services so that customers will perceive additional added value under higher prices.
- On the other hand, in a continuous deflationary environment, companies lose price dominance and are unable to charge higher prices even if they offer higher value-added or new products. Therefore, rather than investing in new businesses and increasing sales, companies will seek to survive by pursuing profit through efficiency gains by cutting costs, including labor costs[13].
- In a deflationary environment, ①management's attention is not focused on new businesses and ②capital accumulation is sluggish[14] due to declining investment in both tangible and intangible assets, making it difficult for innovation and labor productivity to occur.
- In other words, deflation itself is a major cause of the lack of innovation. As will be discussed in Supplementary Note②, deflation in Japan has been caused by factors not directly related to population decline. Given this turn of events, it is possible for inflation in the Japanese economy, which began with cost-push inflation overseas, to continue as a mild inflation of domestic factors, including wage increases, and it is possible for conditions to continue in which innovation and labor productivity growth are likely to occur.

11 See Reference Materials P15
12 See Reference Materials P6
13 See Reference Materials P19
14 See Reference Materials P23

(Supplemented Note②:Why did deflation continue in Japan?)

- As the asset-inflation-induced bubble burst and the balance sheet recession ensued, real asset debt rose due to deflation that occurred in the late 1990s. This necessitated a further reduction in investment than during inflation in order to improve the balance sheet. Such behavior was particularly pronounced in real estate, construction, and wholesale and retail trade, where the impact of the decline in the value of land assets was significant.
- In the midst of reduced investment, sluggish demand, and difficulty in raising prices, companies sought to improve profit margins by cutting costs (PL-oriented management), and the deregulation of labor regulations and the expansion of labor participation by women and the elderly with time constraints combined to increase the number of part-time workers with relatively low wages, resulting in stagnant wages. Combined with the continuous rise in the social security burden (and a further decline in expected lifetime income due to the announcement effect related to future burdens and uncertainty) against the backdrop of a dramatic increase in the ratio of the dependent age population consisting of the young (under 15) and the elderly (over 65), consumer spending stagnated further.
- Furthermore, as a result of globalization, cheap imports manufactured in China and other countries were introduced into the domestic market, consumer spending shifted to consumption of these imports amid stagnant wages, resulting in further price competition and continued price stagnation in the domestic consumer market.
- With such sluggish consumer spending and declining investment demand, and the cost-cutting-centered "price competition strategy" by PL management taking root, companies lost price dominance, and consumers began to factor in falling prices as a long-term expectation, leading to "deflation" becoming a "norm" in the market.
- The implication to be drawn from this is that the long-term trend of a declining population is not necessarily the main cause of deflation. (Japan's working age population began to decline in 1996, and the total population began to decline in 2008. It is possible that declining population may have affected the formation of firms' expectations to some degree.)

(2) Japan's situation under declining population

Key Points

- Japan's long-term deflation was caused by increasing global investment and utilizing part-time worker, not by declining population.
- If we continue to make policy changes based on New Direction of Economic and Industrial Policies that take into account changes in the international economic order and global demographics, we will be able to realize an affluent society in which each person's income increases and everyone lives a vibrant life, even with a declining population in the future.

(Declining population as a root of Pessimism)

- Pessimism among Japanese companies and people is based on the anxiety to declining population.
- First, it is necessary to analyze whether so called "lost 3 decades" is due to declining population, and consider whether the future Japan can enhance affluence and well-being of people even in declining population.
- In this regard, as in the supplemental note on the previous page, regarding the past, Japan's economy has experienced a slump in investment and innovation against a backdrop of deflation, and declining population was not the main cause of deflation. With this in mind, we examine the future Japanese economy.

(In the future: Future projection of demographics of Japan)

- The future projection of population is less uncertain.
- Regarding declining fertility rate, The effects of strengthening measures against declining fertility rate that is undertaken currently as the most important issue will not affect the working age population until 2040 (it takes 15 years until 0year-olds reach the working-age).
- Regarding aging population, the baby boomer juniors, a large mass of population, will be at the later aging stage in the mid-2040s. The dependency ratio, which excludes the working-age population from the total population, will be steady until 2030 and regarding working age population is considered as healthy life expectancy, the ratio of working age population will be steady until 2040 (if the elderly are not mechanically considered to be those aged 65 and over, but rather those aged 74 and over, which in the case of Japan is the healthy life expectancy[15], then in 2040 the elderly will be those aged 75 and over. The target for 2040 is 75 or older, which is 9 to 10 years longer than the age of 65, and the proportion of people who are considered elderly will decrease.)
- Although the number of foreign labor force[16] will increase by several times, it will be difficult to attract foreign workers to jobs with low wages due to comparisons with the rising living standards in urban areas of emerging countries in Asia and elsewhere, although they will contribute greatly to innovation (TFP) by knowledge and skills, and the size of the foreign workforce will not reach a level that will significantly affect the composition of the population. But they will not affect largely in population composition.

[15] See Reference Materials P18
[16] See Reference Materials P17

- Based on the above, assuming that there will be no huge changes on projection of population, and looking ahead to around 2040, the population is expected to decline[17] at an accelerated rate (the average growth rate of the total population over the past 30 years from 1991 to 2020 was 0.06% per year, while the average growth rate over the 20 years from 2020 to 2040 is expected to be −0.6% per year). Similarly, the working-age population (15-64 years old) will grow at a rate of −0.9% per year for the 20 years from 2020 to 2040, compared to an average growth rate of −0.5% per year for the past 30 years.

(The case Japan continues the same way it did in so called "lost 3 decade")

- The Japanese economy over the past 30 years has been characterized by ①real wages remaining flat, ②the labor productivity rising at a rate comparable to main developed countries by making profits by utilizing cheap goods from overseas (e.g., reimportation through overseas investment), ③shrinking domestic investment, and ④slightly increaing GDP.
- As a background, companies have been conducting cost-cutting[18] by using global bases to manufacture goods. They balked at investing in Japan[19] as they perceived the market to be shrinking due to a decline in the number of customers and demand of goods were decreasing. Although the income balance was in the black, domestic investment demand was scarce and profits in global bases were reinvested there, with limited return to Japan domestically[20].
- Looking at the macroeconomy, the corporate sector was in excess savings and government supported the economy by filling the demand for funds through budget deficits, mainly as social expenditures security spending, and the reality was not a "Private Sector-led economy."
- Japan's economy and society did not make enough changes for growth, but it was stable. Under the situation the world order was uncertain, Japan had top class score in social related items such as unemployment rate, rate of low score students and security, according to IMD International Competitiveness Ranking.[21]
- Japan will be stable for a while if it does the same way it did. After that, it will "not be relatively affluent anymore" because emerging countries will catch up to Japan while Japan will not increase real wages and GDP. If Japan will be poor, it's hard to compete with other countries by shortage of economic resources and infrastructure and delay of technologies. As a result, it will lead to lose Japan's social stability.

(The case if Japan changes the way of thinking and doing to the one the "New Direction of Economic and Industrial Policies" showed)

- Simply telling the horror story that "if the status quo is maintained, Japan will cease to be affluent" is not enough to encourage businesses and individuals to take up the challenge and realize a prosperous society.
- What is necessary for sustainable and continuous growth is creating positive cycle that increasing demand leads to strengthen supply then it increases demand again, and it is investment and innovation

17 See Reference Materials P17
18 See Reference Materials P20
19 See Reference Materials P21
20 See Reference Materials P79
21 See Reference Materials P22

that connects demand and supply. It is necessary to stimulate new demands in high value-added fields, triggered by solving social issues, as well as to make investment and innovation on the supply side to satisfy these demands. Sustained income growth based on higher value-added productivity will also stimulate demand for consumer consumption.

- For this reason, "New Direction of Economic and Industrial Policies"[22] that have been presented over the past few years take a different approach[23] than in the past 30 years: a mission-oriented industrial policy[24] that encourages companies and individuals to take on new challenges by making large-scale, long-term, and planned investments in social issues, with the government stepping forward to address them, and integrating macro and micro economic and industrial policies. The government is now working on a new approach to investment.
- As indicated in the Second Report, from the macro perspective, the government has been oriented toward positive cycles: domestic investment, innovation, and income growth. It is necessary for Japan's economic growth and for improving the affluence of its people. In the future, it is necessary for companies and individuals to be able to sustain the efforts required on the macro level and to integrate them with the micro policy agenda.
- If companies and individuals take up the challenges and the government continues to pursue the "New direction" policies in light of the turning point of the era of changes in the international economic order and global demographics trend, as indicated in "(1) Recognition of "The world around 2040" as Assumption of the Future Outlook," we realize, a genuinely private sector-led economy[25] in the future, even with a declining population, each individual's income will increase, and disposable time will increase through digitalization and automation, etc. Detailed services that meet individual needs will be provided with less worker, and the people's lives will develop into a new, smoother, more comfortable lifestyle and a more well-being society. Many foreigners will also visit Japan to experience this. A Future Outlook for the realization of such an economic society is presented on the following pages.

[22] See Reference Materials P30
[23] See Reference Materials P32
[24] See Reference Materials P31
[25] See Reference Materials P83

2. The Future Outlook of 5 themes of "Mission-Oriented" Industrial Policy

- In this part, starting from the global social issues organized in the second report, GX, DX, globalization and economic security, and health and inclusive growth are extracted from the missions for which demand is expected to expand domestically in the medium to long term even under a declining population, and an objective picture is described of ①how the global demand structure will change and ②how the global supply structure will change accordingly. Based on these global business structures, we will show ③how Japan's business structure can be changed through public and private sector initiatives, including New Direction of Economic and Industrial Policies.

(1) GX

Key Points
・ In the world around 2040, the demand of green products and services will increase, while non-green demand will remain. Therefore, a supply system that captures both types of demand will be established.
・ Japanese companies will develop business activities based on the two axes of demand: ①green/non-green and ②domestic/overseas markets, and will capture high value-added markets based on domestic and overseas green demand.

＜Changes in the overall global demand structure＞

- In the world around 2040, climate change will lead to market decoupling, where green demand will expand mainly in developed countries, while non-green demand will remain, mainly in developing countries.

(Demand of green products and services)

- Demand for green products and services will grow and the market will expand, especially in developed countries, due to the accelerating movement toward carbon neutrality (CN) by 2050. Gradually, reduction of greenhouse gas (GHG) emissions will become a prerequisite for entry into the market, especially in developed countries, from the added value of products and services. On the other hand, since some countries have set goals to achieve CN[26] by 2060 or 2070, the progress of CN will vary, and there will be demand for non-green products and services that emit GHGs as before in around 2040.
- In developed countries, starting from national GHG reduction targets, the phase of support measures for each company and product will shift to the phase of domestic and international regulations, and green products and services will become a prerequisite for market entry. Carbon levies and tariffs will be introduced for non-green products in order to achieve reduction targets and indirectly increase the added value of green products. For example, battery regulations have been fully introduced in the EU, and import charges must be paid based on CO2 emissions. Japan will also establish a carbon levy and emissions trading system.

[26] See Reference Materials P33

- Efforts by companies, capital markets, and consumers[27] outside of the country will also be a factor in increasing demand for green products and services. Voluntary efforts by companies that transcend national boundaries and aim for CN throughout the supply chain will continue to precede national efforts. As the scale of such companies grows, trading partners will be forced to achieve CN at an early stage. In addition to these developments, capital market demands and changing consumer preferences will also increase demand for green products.
- Developing countries will also gradually demand green products and services against the backdrop of environmental issues such as air pollution and the achievement of the 2050 CN.

(Demand of non-green products and services)

- Some demand for non-green products and services will remain, especially in domestic industries in developed countries and in developing countries. In particular, demand will remain in developing countries because of the difference in target years for achieving CN.

＜Changes in the overall global supply structure＞

(Supply of green products and services)

- After the supply of green products and services shifts from a thin-margin model, where low added value due to cost competition is compensated for by the quantity supplied, to a world where companies compete on the quality of green added value, companies that combine quality and quantity will have an advantage around 2040, when green will be a prerequisite for market entry.
- Companies will focus on technology development to improve their green value-added and supply capabilities. Since the technologies that produce green products have varying degrees of progress among products, companies will factor in technological uncertainty in their business activities.
- Products that can't reduce GHG emissions will be offset by negative emission technologies such as DAC (Direct Air Capture) and CCUS (Carbon dioxide Capture, Utilization and Storage)/Carbon recycling, etc. Demand for credits will grow, which will stimulate the supply of carbon credits and peripheral services such as certification.
- Corporate location will take into account the supply and cost of renewable and other clean energy sources. Global companies will build their portfolios based on where in the world it makes the most sense to produce green products.

(Supply of non-green products and services)

- Supply of non-green products and services will continue due to demand for conventional products and services, and cost competition will continue due to the limited added value of non-green products in an increasingly CN world. In the long term, the need to secure supply capacity in a shrinking market will drive consolidation of production bases and management entities on a global scale.
- In developed countries, the supply system will be built around domestic demand-oriented industries that have difficulty reducing emissions.
- The location of companies will take into account the supply and cost of non-clean energy, and global companies will build their portfolios from the perspective of where in the world it is most

[27] See Reference Materials P35

rational to produce non-green products. As a result, products that were previously produced and exported in developed countries will be produced and supplied locally to meet demand in developing countries.

＜Changes in Japan's business structure＞

- The current business environment in Japan faces the challenge of the uncertainty of green demand around 2040 and the resulting balance between green and non-green supply systems. There is also the challenge of supply constraints on stable and affordable clean energy in Japan.
- By resolving major parts of these issues through public and private initiatives, including policy responses, Japanese companies will be able to develop business activities based on the two axes of demand: ①green/non-green and ②domestic market/overseas market, and capture high value-added markets based on green demand in Japan and abroad.

(Business Structure for supplying green products and services)

- In response to green demand, companies will obtain added value by conducting R&D and manufacturing final products primarily at domestic sites and deploying them domestically and internationally, with a view to preventing technology outflows. Companies will also add value by increasing energy efficiency.
- In Japan, the creation of a green market through public procurement, etc., and the gradual development of carbon pricing, including emissions trading systems, will make being green a prerequisite for market entry. For non-green products and services from overseas, the potential for carbon leakage will be analyzed and appropriate measures will be taken in a manner consistent with international rules.
- Companies will export domestically produced products with technological advantages[28] to meet overseas green demand. In doing so, develop technologies such as DAC and CCUS/carbon recycling in domestic and overseas markets to increase the supply of green products and services, and purchase carbon credits as needed.
- For some products, an international division of labor will be established, in which technologies researched and developed at domestic sites will be used as the basis for production in renewable energy-rich regions overseas, and the final process will be completed again at domestic sites.
- Due to Japan's limited supply of stable and inexpensive clean energy, industries with low energy cost as a percentage of their added value will be in Japan. Even within Japan, industries will be concentrated in regions that can supply a large amount of stable and inexpensive clean energy, especially in regions where energy costs are relatively low.

(Business Structure for supplying non-green products and services)

- Non-green demand will be met by keeping an eye on the progress of the CN worldwide.
- For domestic non-green demand, Japan will produce enough to meet demand, especially in domestic demand-oriented industries. In Japan, as in other developed countries, the current domestic supply structure may be restructured as non-green demand may decline, although some

[28] See Reference Materials P34

non-green demand will remain, while green demand will increase. In turn, personnel working in these industries may need to move their labor to industries and companies in growth sectors.

- To meet non-green demand overseas, Japanese companies will shift to supplying locally rather than exporting, in light of domestic and overseas emission reduction targets, market size, and other business conditions.

(2)DX

Key Points

- In Japan's economic and social system around 2040, new added value that leads to economic growth will be created and social issues (such as structural shortage of human resources) will be addressed through the utilization of data, including real data (unstructured data) generated in physical space (the real world) on strong digital infrastructure (technology / industrial infrastructure, digital infrastructure, and human resources and digital skills development infrastructure), Society 5.0, where cyberspace and physical space are highly integrated, is on its way to realization.
- The components of such an economic society include ①services (and their providers) that utilize data to provide added value to users (end users and companies that receive products and services in the supply chain). In Japan, businesses are providing value-added "standard services" and creating value-added products and services on the premise of a robust digital technology and industrial infrastructure and advanced data linkage mechanisms. This will lead to the transformation and consolidation of companies into those that combine both data-based management systems and data-driven strategies and business models (DX to create new added value), as well as the continuous creation of new companies.
- The components of the advanced digital infrastructure that is a prerequisite for cyber-physical fusion include: ②digital technology and industrial infrastructure (information processing infrastructure, next-generation computing infrastructure (semiconductors, etc.)), ③digital infrastructure (advanced information and telecommunications infrastructure such as data centers and base stations (hardware), data integration infrastructure (software), rules, cyber security), ④infrastructure for developing human resources with digital skills. In Japan, these digital infrastructures have grown strong and are highly sustainable..

＜Changes in the overall global demand structure (the way products and services are valued through the digitization of society)＞

- The following major changes in the value-added needs of users will occur as a result of the advancement of digital technology. The most fundamental change that will bring about this impact is the construction of a flexible and dynamic value creation process[29] in which cyberspace and physical space interact with each other, with vast amounts of data being created, processed, and analyzed in cyberspace and fed back to users, while instantly capturing user needs. This is a change that will enable the sustainable creation of high added value. In this context, users' desire for tailor-made products and services that can meet their needs in real-time, faster, and more precisely will become more sophisticated.

(Changes in the value chain that bring added value)

- Changes in the downstream of the value chain (at the point of contact with end users)
  - Creation of new experiences by freeing/relaxing users from time/space constraints: The need to make meaningful use of disposable time generated by automation and efficiency, and the need to transcend geographical constraints by using virtual reality, which were not possible in

[29] See Reference Materials P37

the past due to user resource constraints, will increase and become a source of new value-added. This is a source of new added value. Conversely, as time and space constraints approach zero, the value created by a slight difference in time and space will also increase.
(Example: Development of automated driving technology ⇒ Providing experiences in the in-vehicle space is the key, VR/AR technology will enable spatial simulation, drones, etc.
⇒ New purchasing experiences will become possible).

- High degree of personalization of products and services through value visualization: Visualization of customer status and product value, as well as the ability to guide customers to other new products and services, will lead to the purchase of products and services that are optimized individually for each user, with highly convincing content, at individually optimized prices.
(Example: automotive industry: OEMs will go beyond sales of car bodies to offer optimal auto insurance services)

- Changes in the upstream value chain (R&D phase)
  - Acceleration through new methods and realization of potential needs through the creation of innovation ideas: The use of AI and other technologies will speed up the R&D process and generate ideas for innovative products and services, thereby meeting needs that could not be realized due to technical constraints on the part of the provider.
  (Example: AI drug discovery: speeding up the drug development process and creating new drug ideas)
    ※ In the process of value creation upstream of the value chain, there are also examples where the use of data obtained from downstream (contact points with users) can contribute. (e.g., using patient electronic medical record data for drug discovery clinical trials, etc.)
- Changes centered on the midstream of the value chain (manufacturing stage, etc.)
  - Realization of thorough efficiency needs in the supply chain: Highly optimized and labor-saving in the manufacturing process, etc., will enable appropriate fulfillment of needs in the product/service delivery process, such as cost efficiency and response to labor shortages.
- Further Advancement of DX with the Emergence of Generative AI
  - The implementation of generative AI in various operations in all industries, including white-collar areas where AI has been difficult to apply in the past, will significantly automate existing operations and promote the shift of labor to more creative operations, as well as accelerate the provision of high value-added products and services, such as improved customer experience, across industries. Overall DX will be realized.
- Explosive increase in data processing volume
  - The volume of data processing will explode, as information processing will be required not only in industry but also in all aspects of social activities and daily life.

＜Changes in the overall global supply structure＞

(Management of individual companies)

- In order to sustainably obtain the high added value that can only be obtained in a digital society, individual companies and industries must secure the data flow that should be seized for value-

added creation and secure the computing power necessary to develop and provide their own services. In society as a whole, a cycle of efficient utilization of real data (data acquisition ⇒ communication ⇒ storage and linkage ⇒ processing and analysis ⇒ application and service creation ⇒ data acquisition ⇒ ...) will be established.

- Therefore, at the individual company and industry level, it is essential to be aware of data utilization, design strategies and business models, and have high management capabilities to implement them. As a prerequisite for companies that demonstrate this high management capability, they are also able to reform their management systems to enable correct decision making based on data through DX in management itself. It is common sense and a prerequisite for corporate management to promote both "reform to a management structure based on data (DX = CX of management structure)" and "reform to a strategy and business model based on data (DX of strategy and business model)". Based on this management premise, the functions and business partners necessary for one's own business are defined, and the supply chain is reconfigured.
- Under these circumstances, while platform-type businesses that monopolize certain important functions in the value chain and monopolize rents boast high profit margins, competitors are constantly emerging to provide alternative functions and aim for new monopolization of rents, and innovation on a function-by-function basis is gaining momentum in the midst of fierce competition.
- In terms of cyber-physical convergence, developments in AI and robotics will dramatically expand the scope for bringing the results of analysis in cyberspace to actual action in physical space through software and actuators. In this movement, the value of companies that provide these functions, which serve as the connection point between cyberspace and physical space, is extremely high.

(The state of data sharing)

- At the level of society as a whole across industries, each country is moving to establish an Interoperable Data Infrastructure (IDI) optimized for its own characteristics. In some countries, the IDI of existing mega-platforms has become the de facto and data sharing is being promoted in all industries centered on them. In other cases, countries and regions that do not have such mega-platforms may seek to establish a data sharing mechanism that does not allow a specific country or company to monopolize profits from data sharing, while promoting the involvement of public organizations and the introduction of standards and regulations as necessary to avoid monopolization by mega-platforms.
- In building an IDI that encourages the sharing and utilization of data across corporate boundaries, the key to the creation of new data platform operators and the creation of an ecosystem centered on these data platform operators will be to ensure the maintenance of each company's trade secrets and data sovereignty (e.g., access rights).

(The state of digital technology and industrial infrastructure)

- In an economic and social structure that improves and sustains the added value that can be obtained through the utilization of data, the digital infrastructure will also grow strong and maintain high sustainability in order to meet the explosive increase in computing demand[30].

[30] See Reference Materials P38

- The information processing infrastructure (consisting of software related to control of computing resources, cloud technology, etc.), which is at the core of this infrastructure, requires huge capital investment for R&D and manufacturing, so companies with strong capital resources develop more advanced computing technology by obtaining feedback from a large number of users. An ecosystem is being formed[31].
- The next-generation computing infrastructure[32] that will be responsible for economic and social systems around 2040 will require high-speed, large-capacity, and low-power consumption processing. As a key technology to realize this, the design and manufacturing capabilities of advanced semiconductors are becoming even more important. In addition, generative AI is rapidly being utilized in all areas of economic and social systems and, like the cloud, forms an important part of social infrastructure. In line with this, the importance of computational resources and data maintenance, which are indispensable for the development and utilization of generative AI, is further increasing.
- In this context, some mega-platform companies are acquiring the ability to design not only software but also semiconductors, the main components of hardware, from the viewpoint of optimizing their own platforms.
- The demand for electric power is dramatically increasing[33] due to the existence of next-generation computing platforms to meet the exploding computing demand,30 and coupled with the demand for green technology, the competitiveness of industrial locations in areas where green power can be supplied efficiently and stably is increasing. In addition, industrial competitiveness depends on the ability to produce and develop high-performance semiconductors that can demonstrate high energy-saving performance.

(The state of the digital human resources infrastructure)

- As competition for workforce intensifies worldwide due to a constant shortage of human resources who can add value by utilizing digital technology, including generative AI, in manufacturing and service fields, each country is actively working for developing human resources with digital skills, including generative AI, and is developing an environment where the latest data on individual digital skills, upskilling, skill assessment, etc. can be collected, visualized, and utilized collectively.
- Even as the industrial structure continues to undergo rapid changes due to innovations such as generative AI, appropriate labor mobility will be realized through big data analysis.
- An ecosystem for human resources with digital skills including generative AI will be established, which will enable individuals to continue to improve their skills in a personalized manner, and fix the mismatch in job shifting.
- In addition, there are ecosystems around the world that discover and develop creative and talented individuals who are willing to take on challenges in areas they have never ventured into before, and these talents are leading the way in addressing global social issues and creating unprecedented innovation through the development of digital technology.

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31 See Reference Materials P39
32 See Reference Materials P40
33 See Reference Materials P42

(The State of Cyber Security)

- The danger of cyberattacks is increasing with the convergence of cyber space and physical space, and cyberattacks are becoming more sophisticated and complex due to rising geopolitical risks and the development of digital technologies such as AI and quantum computers.
- In recent years, cyberattacks targeting companies with insufficient security measures in their supply chains have been increasing, and the impact is not limited to the company directly attacked, but in some cases, it is spreading to multiple companies through the supply chain. In addition, cyberattacks are becoming more serious and sophisticated, and cyberattacks against various organizations may have a significant impact on people's lives, socioeconomic activities, and the security environment. Cyber security measures are an important issue regardless of the size of a company and from the viewpoint of not influencing other organizations and society.
- Under these circumstances, companies are increasingly recognizing cyber security measures as one of the most important management issues from the perspective of protecting important information and minimizing the impact on business activities and are continuously reviewing necessary measures. In addition, such corporate security measures are now being evaluated by external parties.
- In addition to these measures taken by companies, recently there has also been international progress in the development of systems for software providers and others who offer products. For example, discussions on the use of SBOM (Software Bill of Materials) and IoT security conformance evaluation scheme that visualize secure IoT products are accelerating, mainly in Western countries.
- As these systems spread, vulnerable software products and IoT products with implemented security measures will be visualized, and society will become a society where products with implemented security measures will be preferentially selected in the future.

＜Changes in Japan's business structure＞

- The current business environment in Japan is due to the lack or shortage of advanced semiconductor design and manufacturing capabilities, the inferiority of computing infrastructure and computing resources due to the inability to develop business based on standard services (digital platform type business) that is conscious of global trends, mainly cloud services, and stagnation of open data sharing efforts that transcend the boundaries of operators and industries. There is a shortage of engineers and human resources who utilize digital technology to create business, a lack of human resource development systems, an underdevelopment of organizational governance such as data-based decision-making in companies, and a lack of management capabilities to define and implement added value from the digital perspective.
- The current business environment in Japan faces several challenges, including the lack or insufficiency of advanced semiconductor design and manufacturing capabilities, the lag in computational infrastructure and resources due to the inability to develop digital platform-based businesses centered on cloud services that align with global trends, the stagnation in open data sharing initiatives across businesses and industries, the shortage of skilled personnel and systems for developing human resources capable of leveraging digital technologies to create businesses, and the inadequacies in organizational governance related to data-driven decision-making and the management capability to define and execute added value from a digital perspective.

- In response to these challenges, recent efforts have particularly focused on policy measures aimed at strengthening the digital foundation, including the establishment of domestic semiconductor manufacturing bases, the promotion of research and development, and the enhancement of information processing infrastructure. By continuing these efforts collaboratively between the public and private sectors over the medium to long term, these major challenges can be addressed, leading to the following business structure.

(Management and business development of individual companies)

- Based on the premise that highly reliable and highly technically capable digital technologies and industrial infrastructures and advanced data linkage mechanisms are secured, high-value-added "standard services" are being provided, and high-value-added products and services that utilize data are being promoted. As a result, companies will be transformed and consolidated into companies that perform high management (DX to create new added value) that combines both a data-based management system and a data-based strategy and business model, and new companies will be constantly created.
- As a result, user companies are not relying solely on external providers for IT system implementation, but are instead creating high value-added products and services by leveraging data. Vendor companies, on the other hand, are not only customizing IT systems for each client but also developing "standard services" that align with global trends through digital platform-based businesses. Both user and vendor companies are overcoming the situation that could be described as low-level stability.

(DX for SMEs, etc.)

- In regions where globally competitive companies and human resources are in short supply, regional banks and other core regional entities are stepping up their support of DX for local companies, and local companies are improving productivity and actively utilizing data to overcome shortages of human resources, creating a virtuous cycle of growth that generates sustainable added value for the entire region.
- In addition, as it becomes more common for all businesspeople to have a minimum level of literacy in DX, the digital literacy acquired by managers and employees of regional companies will increase significantly, which will accelerate the active use of digital technology and data in regional companies.

(Data Sharing)

- In Japan, as an ecosystem (form of collaboration) to promote DX in industry, we are working on the "Ouranos Ecosystem," an industry-government-academia initiative aimed at establishing an operation model for the digital age of Japanese industry, including digital infrastructure development and governance of policies and systems.
- As part of the initiatives in this Ouranos Ecosystem, efforts are underway to build an IDI, including the development of a digital lifeline, which is the social infrastructure of the digital age.
- This IDI aims to realize total optimization beyond the boundaries of individual companies and industries under public-private sector cooperation without monopolizing the interests of specific

countries or companies, and to create an IDI that is open to players such as countries and companies both within and outside the region, and that can be globally shared and trusted, including physical data.

- Specifically, the IDI consists of a system that ensures the authenticity and integrity of spoofing, things, data, etc. from the viewpoint of preventing spoofing and falsification, and a system that has functions such as data conversion and processing to facilitate data distribution between players with different data formats. Each player is divided into competitive areas where they can develop and use applications according to their use cases using the system, and the safety and reliability of the operators of the IDI are also externally ensured by institutional measures.
- These efforts are being made to ensure interoperability with IDI in other countries, and in addition to the supply chain IDI related to carbon footprint and due diligence in the battery field, which has been advanced to meet the current European battery regulation, and gradually to the IDI in other fields. In addition to the supply chain IDI for carbon footprint and due diligence in the battery field, which has been advanced to meet the current European battery regulations, the construction and utilization of the IDI in other fields will gradually expand. In addition, as digital lifelines centered on this data linkage infrastructure are developed throughout the country, many people, including local residents, will be able to easily and inexpensively access digital services such as drones and self-driving cars, thereby realizing more well-being lifestyles.

(Digital Technology and Industrial Infrastructure)

- In Japan, rather than being centered on a small number of giant companies, an ecosystem will be formed between the user community with advanced computing demand and the information processing infrastructure development community, where the creation of user demand and technological sophistication will mutually circulate.
- In the information processing infrastructure industry, the information processing infrastructure in Japan will be secured and maintained by companies with business bases in Japan by developing computational resources for sophistication (power saving and efficiency) and providing computational resources for inference for the wide use of AI, as well as computational resources for AI development. In addition, in order to promote its use in economic and social systems, development is being carried out to improve the performance of generative AI, and the importance of data required for development will further increase.
- In the design and manufacture of advanced semiconductors, Japan has secured a certain amount of domestic production capacity for each node and has established a sustainable funding and human resource development and securing system to secure and maintain a high level of global competitiveness[34].
- As the demand for electricity from next-generation computing infrastructure grows in Japan[35], the country is facing resource constraints,
  - If most of the electricity supply is provided domestically, Japan faces the risk of higher electricity prices due to the use of relatively expensive clean energy, or a larger trade deficit due to increased imports of fossil fuels.

[34] See Reference Materials P41
[35] See Reference Materials P43

- If the computing demand is met from overseas firms, Japan faces the risk of a widening services deficit due to increased imports of computing services.

The country will face the following situation. In order to meet digital demand and maximize national wealth, energy and macroeconomic policies will be selected based on comprehensive and strategic consideration of the electricity demand, energy prices, service prices, and other conditions of the time.

(Digital Human Resource Infrastructure)

- In Japan, an environment will be established where the latest data on individual digital skills, upskilling, and skill assessment (examinations, qualifications) will be managed collectively, as a result, a "learning culture" and "growth mindset" has taken root in which individuals from elementary to adult continue to improve their skills in a personalized manner. In addition, an ecosystem for human resources with digital skills will be realized,[36] where labor mobility based on big data analysis will be realized, and the right people will be in the right places according to their skills.
- In addition, an ecosystem has been established in Japan to discover and nurture creative top talent who will take on challenges in unexplored areas, and who will be responsible for solving social issues and creating new innovations.

(The state of cyber security)

- Not only large companies but also small and medium-sized enterprises (SMEs) recognize the importance of cybersecurity and are strengthening measures such as establishing necessary systems, enhancing investments in security, procuring highly secure products and services, and taking supply chain measures, in accordance with their own business realities.
- Furthermore, companies that provide digital-related products and services recognize their responsibility to ensure security for their customers and are taking security measures into consideration from the design stage. In addition, they are also using systems to visualize the status of security measures and effectively account for the security status of their products and services.

[36] See Reference Materials P44

(3) Globalization and Economic Security

Key Points

- Supply chains are being restructured with an awareness of pandemics, geopolitical risks, economic security, etc.
- In addition to the WTO/EPA, strategic alliances among like-minded countries will be strengthened through sectoral and country-by-country arrangements.
- Japan is transforming its economic structure to one that can grow sustainably while capturing global demand.
- Measures to maintain and gain Japan's technological advantage and prevent its loss are important.

＜Changes in the overall global demand structure[37]＞

(Changes in macro external economic conditions: individualization of markets according to regional characteristics and changes in global demand according to demographic)

- Despite highs and lows due to business cycles and geopolitical factors, the global economy is expected to grow at a steady rate of about 2% per year in real terms as the global population increases and DX and GX serve as starting points for new business and innovation in existing businesses.
- Demand (= volume of transactions x price) undergoes the following changes for each demographic.
  - Population declining areas (e.g. Japan, Europe, China, etc.):
    Demand for existing products and services will decrease as the quantity of goods declines in the past extension, but demand will increase through the development of new demand through ①valorization of solutions to social issues and ②data-driven creation of new value, in addition to increased demand through higher prices for "good things come at a price".
    ① Solving social issues (GX, economic security, etc.): Although it is difficult to lead to manifest purchasing behavior in the natural state, it is artificially valorized through the power of government policies in various countries.
    ② Data-driven new value creation (DX, health, inclusive growth of regions, etc.): Providing new value based on various data acquired from customers, creating new demand by easing time and space constraints, and meeting thorough efficiency and automation needs, especially in areas with declining populations.
  - Population growth areas (Global South, including U.S., emerging and developing countries):
    In addition to the new demand development described above, demand will increase due to the rise in transaction volume as a result of population growth. Countries of the Global South will have a greater influence on the global economy, and the influence of the Western bloc will become relative (G7's share of the global economy will decline to about 30%, although cooperation among developed countries will strengthen).

[37] See Reference Materials P45

(Changes in international political and economic conditions)

- The G7 and G20 continue to have a certain significance as a forum for the leaders and ministers of major countries to frankly exchange views on the world economy and global issues, but there is a possibility that each country will increasingly tend to give priority to its own national interests.
- Despite attempts by countries in the Global South to present new options, the international financial framework, led by The World Bank, IMF, and other international institutions, continues to function to promote stability and sound development of the global economy. The WTO has brought certain disciplines to international trade and investment while addressing new issues such as industrial policy, environment, economic security, and digital economy.
- What could be expected around 2040 based on the current situation.
  - In Northeast Asia, China is projecting global power as a superpower comparable to the United States, while geopolitical tensions (Korean Peninsula, China–Taiwan relations) that have persisted since the 20th century remain at the foot of the region.
  - In Southeast Asia, the "middle-income country trap" has been overcome and flourished as investment flows in to avoid geopolitical conflict between the U.S. and China.
  - In Southwest Asia, the population continues to grow, and India is closely trailing the U.S. and China in market size. In the Indian Ocean, China and India are competing for influence.
  - In the Middle East, tensions between opposing religious, ethnic, political, and economic systems have become the norm, but the economic and social landscape has undergone a major transformation with the decarbonization of the region.
  - In North America, the U.S. enjoys prosperity in innovative industry clusters such as computing, clean, and biotechnology, and in the economic integration of the USMCA (U.S.–Mexico–Canada Agreement). While fragmentation and inward-looking orientation within the U.S. remains, involvement in the Free and Open Indo-Pacific (FOIP) continues.
  - In Latin America, stability, distancing itself from geopolitical tensions in the Northern Hemisphere.
  - While security tensions remain in European–Russian relations, the cohesion between the two countries has been strengthened in the form of Russia's deepening dependence on China, and a one-belt, one-road economic zone has emerged on the Eurasian continent.

(Changes brought about by economic security imperatives)

- While countries made progress in their moves to ensure economic security in the 2010s and 2020s, economic security responses to threats and risks will still be necessary around 2040. In other words, it is necessary to respond to moves by nations that absorb and acquire technologies and products from other nations, enclose supply chains within their own countries, make other nations dependent on their own supply chains by dominating the global market, and engage in economic coercion. Governments, including Japan, should aim to ensure economic security.
- However, since "economic security" is dynamic and countries' strategic goals are reviewed and changed from time to time, the countries to be aware of in terms of economic security and the necessary intensity may have changed significantly from the current situation.
- While promoting a global strategy that is based on rules and that endorses the expansion of trade and investment into other countries' markets, the way of trade and investment in this international

political situation has shifted from the traditional global flattening of the division of labor in the production of products and services across the globe according to comparative advantage, and there continues to be a need to procure critical goods and products (strategic goods and products) within one's own country and within like-minded countries.

- In line with the above international trends, strategic commodities and products will become more scarce and demand for them will increase both globally and domestically. For those items for which demand is increasing and supply is limited due to technological and resource unevenness factors, their value (unit price) will increase due to their scarcity.

＜Changes in the overall global supply structure＞

(Changes brought about by GX, DX, and economic security GX、DX)

- In the global energy transition toward net-zero, decarbonized energy sources such as renewable energy, hydrogen, and nuclear will be supplied at stable and reasonable prices over the long term, taking into account integration costs and the investment required to make the transition (IEA forecasts that fossil fuel demand will peak by 2030 (The IEA also forecasts that demand for fossil fuels will peak by 2030).
- An international framework for the stable supply of critical minerals is in place, and the stable supply of mineral resources and energy, and their prices, will no longer be the main growth constraint on the Japanese economy.
- DX progress will promote digitalization of trade procedures, etc., lowering the cost of trade in goods and stimulating cross-border trade in services.
- Memories of pandemics and geopolitical tensions make contingency preparedness mandatory for business operations.

(Factors affecting the competitiveness of the industry)

- Social Problem Solving Capability: In the area of social problem solving, such as GX and economic security, the key is to build corporate management and business models that combine capability acquisition (R&D, capital investment, human resource development, etc.) with flexibility to respond to unexpected changes, based on the assumption that uncertainty exists.
- DX: Competition to seize customer "data," competition for customer experience over leisure fulfillment, and winner-take-all network effects will need to be addressed.
- Industrial policies of national governments: Companies will locate where they have a competitive advantage, taking into account not only social burdens such as taxes, but also policy support such as subsidies, geopolitical location, and access to management resources (clean energy, water, land, highly skilled human resources, living environment, etc.)

(GX, DX, and Economic Security Restructuring Global Value Chains)

- GX will lead to a concentration of wealth in countries that supply decarbonized energy and net-zero technologies, while DX will lead to a concentration of wealth in companies that produce innovations such as platformers and generative AI. In addition, the growing awareness of economic security will increase the demand for Transparent, Resilient and Sustainable Supply Chains.
- Strategic supply system and production base for goods and products

- For strategic goods and technologies that are superior to those of other countries, we will strengthen our exports by actively collaborating with like-minded countries to firmly fulfill our supply responsibilities among them, as well as from the strategic perspective of expanding the profits of our domestic industry and seizing choke points. In addition, strict controls will be implemented in consideration of the risk of military diversion, etc.
- Due to the need to secure a stable supply of strategic goods and products, and due to the increase in value resulting from increased demand, supply chains for strategic goods that cannot be completed in the home country alone will be oriented toward a diversified supply chain that also links up with like-minded countries that can easily secure supply systems to the home country.

(Increased awareness of economic security)

- While the expansion of international trade and investment contributes to increased economic efficiency, having witnessed the adverse effects of weaponized economic dependence, governments and businesses are keenly aware of the risks of excessive reliance on trade and investment in particular partner countries.
- In addition to traditional economic partnership agreements and investment agreements, there is a growing movement among volunteer countries to form sectoral agreements.
- To ensure the continuity of our country's economic and social activities in a world of heightened geopolitical uncertainty, it is essential to build a vibrant industrial base at home and abroad.

＜Changes in Japan's Business Structure＞

- Japanese companies (and the Japanese economy as a whole) will primarily face the following challenges in a world facing the supply-demand changes described above.
  - Restructuring of external economic and trade strategies as Japan's shift to a medium-sized country becomes a prerequisite for capturing global demand (from both the US and non-US/EU economic zones)
  - Formation of an international framework and rules that will facilitate the overseas deployment of Japan's high value-added products and services, and enhancement of global intelligence capabilities in the public and private sectors.
  - Restructuring of the international market environment and supply chain to avoid the risk of market shakeout or withdrawal from the market due to the transfer or outflow of Japan's superior technology (loss of technological superiority), and strengthening the intelligence capabilities of the public and private sectors.
- By resolving the major parts of these issues through public and private sector efforts, including policy responses, the Japanese economy and Japanese companies are able to realize the following picture.

(Changes in Japan's Macroeconomic Situation)

- In China, ASEAN, India, and other countries of the Global South, megacities have sprung up and the middle class and affluent population are rapidly increasing. These factors will provide Japan with opportunities to capture foreign demand, creating export opportunities for Japan's high value-added

products and services, and stimulating domestic investment to expand supply capacity. The bottleneck of Japan's economic growth, the underinvestment that has damaged capital accumulation and lowered the growth potential of the Japanese economy, will be remedied, creating a virtuous cycle of innovation and growth.

- In order to maintain economic and industrial vitality as Japan becomes a medium-sized country, it is essential to capture growing foreign demand not only from developed countries in Europe and the U.S. but also from countries in the Global South. Trade dependence (trade value/GDP) will increase from around 40% in the early 2020s, and Japan will shift to an economic structure that can grow sustainably while capturing global demand (shift from domestic demand-led to foreign demand-led). Terms of trade[38] will improve as a result of increased competitiveness of export goods and a shift away from excessive dependence on fossil fuels, contributing to higher real wages.

(Changes in the competitive strategies of Japan-based companies and Japanese industry as a whole)

- As the Japanese economy becomes a medium-sized country in the world, Japanese companies will leverage their strengths, such as a full-set industrial structure, the attractiveness of culture and content, and a national character that has achieved a stable society, to compete with the rest of the world.
- While expanding trade and investment with foreign countries more than ever before, we will position Japan as the "creative center of the world," such as its global headquarters and factories, and continue to expand domestic investment, wage increases, and innovation, including software and R&D, commensurate with the return and utilization of profits earned around the world to the domestic market.

(Restructuring of the international market environment and supply chain, strengthening public and private sector intelligence capabilities)

- The following efforts are being made to avoid the risk of the elimination or withdrawal of commoditized technologies and goods from the market.
- For companies based in Japan, the options for corporate strategy to secure sustainable earnings include production and export of strategic goods and products with high added value, in addition to products and services with little competition and where Japan can leverage its strengths, and restructuring of global supply chains in cooperation with companies in like-minded countries.
- While trade and investment activities in other countries' markets for strategic goods and technologies are indispensable for maintaining and improving the technological and industrial competitiveness of companies, Japanese companies must adopt an overseas strategy that avoids excessive dependence on specific countries, taking into account the risk of being forced out of the market by the enclosure of technologies and supply chains.[39] (This risk structure is a common risk for Japanese companies, regardless of whether they are headquartered in any country or not.)
- In addition, there is a risk that the transfer or outflow of superior technology may lead to catch-up (loss of technological superiority), and furthermore, Japanese companies may be forced out of the market due to the enclosure of the relevant technology and related supply chain.

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[38] See Reference Materials P47
[39] See Reference Materials P48

- However, supply chain risks vary from time to time depending on the political and economic situation in each country, and economic alliances on common issues (e.g., climate change, healthcare, etc.) where interests are aligned will be further expanded subject to close examination of risks.
- For companies and industries involved in various industries and products, further aggressive expansion into global markets is the cornerstone of their management strategies. It is common sense and a prerequisite to evaluate geopolitical risks in overseas expansion, while always being aware of securing the competitive advantage of their products and technologies. In addition, when reviewing or withdrawing from a business through M&A, it is common sense and a prerequisite to consider the risk of outflow of Japan's superior technology to a partner company due to the policies of another country's government.
- It is an important element of corporate and industrial strategy to grasp the rare and high value-added technologies that form the basis of the people's daily lives, to avoid over-dependence on certain countries, and to strengthen the ability to produce and export goods that form the basis of the people's daily lives.
- The government will strengthen its intelligence capabilities and conduct enhanced scenario analysis and information sharing with the private sector on the ever-changing international situation, trade strategies of other countries, and the economic security situation. The private sector will also become more active in intelligence information, and strategic dialogue between the public and private sectors will become more active.

(4) Health and Inclusive growth of the region that contributes to coping with a declining birthrate

Key Points

- Japan, with its declining birthrate and aging population, is a mirror image (leading indicator) of the future world. Various products and services will be developed to manifest the latent needs for health through technology and will also enter the global market.
- By describing out the involvement of entities that can maximize the value of the region, increasing productivity and wages while also utilizing technology, and improving the sustainability of infrastructure, a region will be created where young people can enjoy good jobs and a rich living environment, and young people will settle in rural areas where they can easily raise their children and the desired fertility rate will improve.

(Health)

＜Changes in the overall global demand structure＞

- Staying healthy is one of the fundamental human desires. Based on global population growth and urbanization, the demand for health has been increasing, but until now it has been difficult to manifest. However, with the increase in life expectancy, government intervention (regulations and social security systems), and the use of technology, this latent demand will become more apparent[40].
  - Longevity is an irreversible trend worldwide. Demand for health, including medical care, will emerge against the backdrop of an aging population.
  - Demand for health will be manifested through government intervention in improving the health of the population through regulation and social security systems.
  - Technology is making the relationship between health promotion efforts and health status visible, and demand is emerging.
- On the other hand, the increase in social security benefit costs due to the aging of society and the increasing sophistication of medical care is a challenge common to all developed countries. Appropriate division of roles between products and services within and outside the public insurance system and avoidance of moral hazard are required.
- Combined with the extension of healthy life expectancy, the elderly will be able to continue working if they wish, rather than retiring uniformly at age 65. (According to the life-cycle theory of consumption,) the elderly will also increase their consumption to improve their own Quality Of Life (both within and outside of public insurance) as they earn income.
- The working-age population will also invest in their health from a young age so that they can stay healthy and work longer. Companies also increase investment in employee health as part of human capital formation. In addition, prevention and health promotion are lifestyle improvements themselves, and will be increasingly integrated with lifestyle-related expenditures.

＜Changes in the overall global supply structure＞

- Gene therapy and regenerative medicine will become commonplace, and new products and services will emerge through the use of AI and other digital technologies in health-related services.

[40] See Reference Materials P49, P50

- PHR (Personal Health Record) is a typical example. By utilizing personal lifelog and health-related data, all kinds of products and services, including clothing, food, and shelter, will become high-value-added with health as the starting point.
- In response to the serious shortage of medical and nursing care personnel, AI, robots, and other technologies will be introduced to enable the efficient provision of services such as telemedicine and AI diagnostics.

＜Changes in Japan's Business Structure＞

- The current business structure in Japan is characterized by a lack of rules and standards for collaboration and data handling among PHR providers and medical institutions, overreliance on public insurance and a tight supply of services within the public insurance system, and sluggish R&D and overseas expansion of medical devices and pharmaceuticals. If major parts of these issues can be resolved through public-private sector efforts, including policy responses, the business structure will be as follows.
- The health challenges in Japan are a mirror image (leading indicator) of the future world, and new products and services adapted to the super-aging population will be developed. These products and services will create new demand for health care in Japan and meet the growing demand[41] for medical and long-term care services.
- Japan's social security system will be able to focus public insurance benefits on more necessary people and more effective measures from the perspective of social security fairness, the burden of insurance premiums, and financial sustainability, as the number of recipients of services outside the public insurance system will expand.
- Japanese medical devices and pharmaceuticals will be developed globally by expanding the base of hospitals and doctors who use them through the acceptance of foreign students at medical universities in Japan, networking with local influential people overseas, and conducting clinical trials overseas. Not only these goods, but also data and services that utilize such data will be exported to the rest of the world. Furthermore, medical inbound travel by foreign tourists is expanding in order to receive high-quality medical checkups and treatment in Japan.

[41] See Reference Materials P51

(Inclusive growth in the region)

＜Changes in the overall global demand structure＞

- Demand for investment as a location for industry will increase in regions that are home countries or like-minded countries that share values from the perspective of economic security and other factors, and that are equipped with factors such as sufficient land, abundant water, and high-quality human resources. In addition, demand will increase in regions where green power can be procured inexpensively to meet Carbon Neutral needs.
- As the global middle class expands and its leisure time is fulfilled, digital and information goods (content, etc.) and experiential values that cannot be realized digitally (artistic values, lifestyle, tourism, etc.) will advance. The value of tourism and inbound travel, which allows visitors to experience the unique culture of a country or region, will rise, and combined with lower travel costs and other factors, demand for tourism and inbound travel will increase significantly.
- In response to social issues such as labor shortages and the disparity between urban and rural areas (income and opportunity), AI, robots, and other technologies will be implemented one after another with relatively little concern that they will replace jobs in areas where labor is scarce due to population movement to cities and develop more than cities. Leapfrogging may occur.

＜Changes in the overall global supply structure＞

- Regardless of the attributes of the actors, such as foreign or domestic investment, inside or outside the region, large corporations, small and medium-sized enterprises, or local start-ups, the regions that can actively draw out and accept the involvement of actors that can maximize the value of the region will develop.
- Even as industries become increasingly platform-based, services optimized according to local characteristics will be provided at the customer contact point (last one mile).

＜Changes in Japan's business structure＞

- The current business structure in Japan's regions faces challenges such as aging or insufficient industrial infrastructure, inadequate high value-added and price shifting, resource constraints for small and medium-sized enterprises with room for growth, structural labor shortages[41], and ensuring the sustainability of the infrastructure for daily life. If the major parts of these issues can be resolved through public and private sector efforts, including policy measures, the business structure will be as follows.

(Creation of quality jobs)

- Regions with potential for industrial location are selected as better investment destinations than emerging and developing countries, based also on government support[42].
- In other regions, high-quality jobs will be created by the promotion of tourism and inbound tourism by taking advantage of the rich nature, lifestyle, cultural resources, and sports, and by local small- and medium-sized enterprises.

41 See Reference Materials P52
42 See Reference Materials P53

- Businesses will have to deal with structural labor supply constraints by selling good products and services at good prices, obtaining high added value, increasing productivity through labor-saving and other efforts that also utilize digital technology, and retaining workers with high wages and flexible work styles and benefits that suit individual life stages, etc. In addition, they will have to retain workers by offering high wages and flexible work styles and benefits that suit the individual's life stage. Companies that improve the quality of employment will attract a diverse workforce, including younger generations and women.

(Creation of a prosperous living environment)

- Municipalities will provide attractive education to attract young people. In the process, they will acquire human and financial support, including donations from companies and individuals, and an ecosystem will emerge in each region where value-creating human resources that support the region's best companies will be developed.
- Regional industrial infrastructure, lifestyle infrastructure, and lifestyle-related services will implement technology (digital, automated driving, drones, etc.) and be integrated and operated so that infrastructure efficiency and service productivity can be maintained even in areas with low population density, which is difficult to maintain with the current system. However, compact urban planning and land use can be a viable option in the face of extreme depopulation and the potential for higher costs of public services that support individual and social life.
- In addition, small businesses that support local economic infrastructure such as livelihood-related services and also serve as the core of the community, such as the bearers of local culture, will continue to support the community through their businesses, and ambitious small businesses will be created to expand their businesses. In addition, an ecosystem will be created that will create Zebra companies that will work to solve social issues in the community through business methods.

- In this way, high-quality job creation and the maintenance of living infrastructure will be compatible in diverse regional centers with enhanced functionality.
- As a result of the transformation of companies and regions, areas where people can enjoy high-quality employment and rich living environments will be created, and the young generation will settle in such areas, restoring their "hope" to marry and raise children, thereby turning the desired fertility rate, which continues to decline, into an increase.

３. Changes in overall Industries

- In this part, we will present an integrated Future Outlook for each of the missions, describe how they will be addressed simultaneously and in an integrated manner, and present an overall vision of what new demands will be created and how the industrial structure will change (reorganize) in Japan and all other the world.

Key Points

- Japan will take on the challenge of competing in the global marketplace and enriching people's lives in response to the changing demand structure of solving social issues and data-driven new value creation.
- Industries that compete in the global marketplace will retain and strengthen high value-added creation functions such as management, business, and product service strategy planning and the most important research and development bases in Japan. Profits earned around the world will be returned to Japan while also being used as a source of funds for future investment.
- Industries that take on the challenge of improving the quality of life will work to create added value and save labor.

(1) Changes in demand structure around the world

- Demand (= volume of transactions x price) undergoes the following changes for each demographic.
- Population decline areas (Japan, Europe, and China): Demand for existing products and services will decrease simply by extending the past, but demand will decrease by improving quality and appealing to value (good products and services come at a price), which are worth higher prices. In addition to increased demand through ①making solving social issues profitable and ②developing new value creation in a data-driven mannner.

  In economies that have succeeded in creating a business environment that can respond to such increased demand through corporate management reforms and national policies, such additional and new demand will be established through increased purchasing power through higher wages.

  However, those economies that continue to follow the model of the era of population growth and have not undergone any changes will experience a decline in demand due to the lack of purchasing power.
- Population growth areas (U.S., emerging/developing countries, etc. Global South): In addition to the above-mentioned new demand development, demand will increase due to higher transaction volume and unit prices resulting from population growth and increased purchasing power.

① Value creation by solving social issues (GX、Globalization and Economic Security, Circular Economy, etc.)

- Social issues such as global warming and security are unlikely to lead to manifest purchasing behavior by each individual or company in the natural state due to the probability, time frame, and synthetic fallacy of the risk manifesting itself. A vicious circle is created in which a market is not created because it does not become a demand, and a supply is insufficient in quantity and quality to lead to the manifestation of a need.

- Therefore, through the power of national government policies, these "solutions to social issues (missions)" are artificially manifested and "valorized" to create markets and a variety of supply entities and services, thereby accelerating the manifestation of true demand.
- For example, GX values "CO2-free" through policy. Because of the large share of externalities, it is clear whether CO2-free is a "value" or a "cost" depending on the existence of policies and the willingness of huge capital to be the purchaser of CO2-free products. This results in a decoupling of green and non-green markets.
- In addition, economic security will experience "choke point value increases" and "redundant and alternative needs". In response to heightened security risks, demand for chokepoints (goods, products, technology, and data), which have a significant impact on the sustainability of economic and social activities, will increase in value. To reduce risk in times of crisis, the total demand will increase as the need for redundant and alternative needs and products that would be a cost in peacetime increases.
- Similarly, demand for other solutions to social issues such as resource-autonomous economies, etc., other than these, will emerge through the power of policy.

② Data-driven new value creation (DX)

- If new value is provided based on various data acquired from customers, new purchasing behavior of each individual or company will occur.
  - Tailor-made value offerings: Optimizing the content, price, timing, etc. of products and services to customer needs. An example is the provision of insurance services based on driving data.
  - Revealing latent customer needs: Uncovering needs that customers themselves are not aware of through thorough analysis of customer data.
  - Adding high value to products and services through analysis of customer mass data. An example is the development of new durable products by utilizing failure data.
  - Structuring unstructured data/creating innovative products and services through new data creation. For example, there is the development of new drugs through AI analysis using disease data as teacher data (data used by AI for machine learning).
- New consumption needs will be created through the relaxation of temporal and spatial constraints. Innovations in digital technology will ease the time and space constraints on daily life and production activities that have been considered a given in the past. As a result, new consumption needs will be created to enhance the leisure time that is generated. For example, (generative) AI eliminates the need for routine work, automated driving frees up travel time, and VR/AR allows people to experience highly realistic life abroad from the comfort of their own homes.
- Demand for thorough efficiency and automation will increase, especially in areas with declining populations and labor shortages. Demand for digitalization and software-based automation will increase significantly, especially in labor-intensive service industries that currently require human intervention, and in some manufacturing industries that have not yet fully automated their operations.

（2）Changes in supply structure around the world

① Changes in competitive strategy

- As a common matter of competitive strategy change due to the valorization of “social problem solving” (GX, economic security), we are confronted with a market environment that is influenced by the progress of policies in each country. Therefore, while assuming the existence of differences and uncertainties in each country, companies will be able to acquire proprietary technology, know-how, and business partners to secure superiority, make rapid and large-scale capital investments to earn secure first-mover advantage (including data accumulation), and establish agile corporate management and business models that can respond to unexpected changes. Companies will be able to survive in the international competition where winner-take-all and oligopoly are becoming more likely to occur.
  - From the perspective of GX, as green and non-green markets coexist throughout the world, a rapid green/non-green switch (agility) in response to the expansion of markets where CO2-free is valuable, an optimal CO2-free value allocation strategy that also utilizes digital technologies, and access to inexpensive green access to energy will be key competitive considerations.
  - From an economic security perspective, players holding chokepoints enjoy high margins except for the threat of substitutes/ Players forced to rely on chokepoints, how they can build supply chains that reduce their risk is key to their business sustainability.
- The result will be a restructuring of the global supply chain to ensure competitiveness: starting from GX, optimization of domestic location and overseas local production according to the green/non-green nature of the product/market will proceed. Economic security will be the starting point for restructuring supply chains at home or in volunteer countries to reduce risk.

- The change in competitive strategies due to DX will have the effect of easing the space-time constraints on the provision of products and services, and global competition will intensify and continue in all industries and value chains, regardless of whether they are manufacturing or non-manufacturing. Combined with the network effect, winner takes all will become more pronounced, and the speed of replacement of winners due to technology will accelerate.
  - Competitive power will shift to players who have the “data” of end-consumers’ needs. Data-driven network effects will continue to benefit consumers, resulting in a structure that is more likely to allow natural monopolies for providers. It will be important to build an ecosystem that is not limited to individual companies, such as how to seize data on rare and valuable customer needs, secure customer contact points, platforming, and supply chain/value chain. In addition, as latent needs become visible through data, the provision of additional value will become important for competition, and industrial value chains will melt down and reorganize.
  - New value provision through data will occur at all layers of the industrial value chain, not just near downstream (end consumers).
  - Competition for leisure satisfaction will arise regarding the creation of two types of products and services: products and services that fully utilize digital, and customer experiences that cannot be realized digitally (advanced human touch, artistic value, etc.).

- The pursuit of thorough automation through digitization and software will increase, especially in labor-intensive service industries and some manufacturing industries that are not fully automated.

- In addition, competition for management resources will intensify. Corporate management will be required to compete not only under the traditional concept of globalization, in which the world competes on a common basis, but also in consideration of diversity based on the circumstances and culture of each country. Companies will manage their businesses more than ever with local production for local consumption in mind, focusing on new demand for solutions to social issues that are influenced by policy trends in each country. As a result, competition for global and local acquisition of data, technology, intellectual property, and the human resources to create these will intensify.

② Changes in government industrial policy: Development of a strong domestic attraction policy (moving into an era of global location competition)

- It is assumed that governments, including developed countries, will develop industrial policies to attract high value-added industries and firms domestically against the backdrop of heightened geopolitical risks and the needs of their respective citizens.
- Domestic and foreign companies will adopt the optimal functional allocation (i.e., companies will choose the country/region in which to locate) in order for their companies to meet the expectations of the capital markets. In selecting such locations, it will be commonplace to make a comprehensive comparison not only of tax and other social burdens, which were evaluated in the traditional global era, but also of subsidies and other policy support provided in each country, geopolitical location, and access to business resources (clean energy, water, land, highly skilled human resources, living environment, etc.).
- In addition, as governments implement policies to provide access to attractive management resources to domestic and foreign companies, they should pay attention to the interconnection among policies. For example, as DX progresses, it will be necessary to strengthen the computing infrastructure to meet the increasing computing demand, which will require a simultaneous response on the GX side to strengthen decarbonized power sources.

(3) Changes in Japan's industrial structure (demand and supply) by New Direction of Economic and Industrial Policies

① Challenges to be overcome to realize the industrial structure in the Future Outlook

- The current business environment in Japan faces the challenge of agile small and medium-sized enterprises (SMEs), start-ups, industrial infrastructure[43] such as land, industrial water, clean energy, and computational resources, human resources for R&D[44], management, etc., and a lack of financial capital for companies to operate at a global level. The country is facing a lack of industrial infrastructure such as land, industrial water, clean energy, and computational resources.
- In other words, the industrial structure scenario presented in this section can be realized if Japan can acquire the following functions that will serve as the foundation for its realization. And only in

[43] See Reference Materials P71
[44] See Reference Materials P26, P27

business areas where the next function can be procured, companies headquartered in Japan and the location of Japan will survive in the international competition.

- Agile management philosophy and capabilities: A flexible and bold (agile) management philosophy and capabilities must be in place in a large number of companies that thoroughly pursue a high level of added value and quickly and repeatedly transform/create businesses and make large-scale investments in response to the needs/seeds of the times.
  - ※ If this can be achieved, the scale and performance of traditional companies will be relativized, agile companies will gain a competitive edge, and the potential for new players to play a pivotal role in the Japanese economy will expand. (The growth potential of agile small and midsize companies and startups, the main agents of change, will expand.) The impact of this change will extend to the reorganization of industrial structure, labor mobility including management personnel, and financial capital mobility.
- Advanced human resources and their education/social system: An education/social system that thoroughly invests in research, production sites, marketing, and management human resources (including advanced foreign human resources) equipped with the above management philosophy and capabilities that are top class in international comparison, and in training and securing such human resources.
- Advanced management system and governance: A large number of companies will achieve a system that enables highly competent management to make decisive decisions and conduct business quickly, and corporate governance that supports this system; for example, the appropriate integration of a long-term vision to enhance corporate value by fostering future expectations and a medium-term business plan to realize the vision, the implementation of a highly effective board of directors that also takes into account independence and diversity, and the optimization of management term limits through substantive deliberations by the board of directors and nominating committee on the reappointment or non-reappointment of management[45].
  - ※ If this can be achieved, growth investments by Japanese companies, including M&A, will be stimulated both domestically and internationally. In particular, by linking with mission-oriented industrial policies such as GX and economic security, growth investment in Japan is expected to be stimulated. By sustainably enhancing corporate value enhancement through value-creating management as described above, the P/B ratio of Japanese companies[46] will improve.
- Large-scale financial capital backed by advanced management systems: Large-scale capital that is a necessary condition for future investment in order to compete globally, which can be obtained only by companies that grow through distinctive, high-value-added businesses and manage at a global level, as described above.
  - ※ As the global share of the Japanese economy declines, the number of investors who include "Japanese companies in general" in their investment indexes may decline. On the other hand, companies that operate at a global level, as described above, will be found by

[45] See Reference Materials P58
[46] See Reference Materials P57

investors who invest by observing the growth potential of individual companies on a micro level and will be able to raise large funds.

- Required industrial infrastructure: available land, water, clean energy, computing resources, etc. that are top class by international comparison.

- If the above functions can be acquired through public and private initiatives, including policy responses, the following business structure could be realized.

② The Future Outlook of Overall industrial structure (general discussion)

- It is necessary to make profit by innovation for Japan that has no choice but import foods, energy resources and materials. While people all over the world seek for solving social issues, it is a chance for Japan as the advanced country facing many issues.
- Japanese companies will take on the challenge of competing with the rest of the world and enriching people's lives by leveraging Japan's strengths[47], such as a full-line manufacturing network, the attractiveness of lifestyle, culture, and content, and a national character that has made Japan a stable society, as the Japanese economy becomes a medium-sized country in the world. While expanding exports and investments overseas more than ever, they will position Japan as the "Global Creative Base," including its global headquarters and factories, and continuously expand domestic investments (including software and R&D), wage increases, and innovation, commensurate with the return and utilization of profits earned around the world in Japan.
  - Since the number of domestic customers, especially young people, is declining in proportion to the population, growth cannot be expected simply by continuing price competition in existing businesses. However, with a background of sustained expansion of domestic investment, accelerated innovation, and higher incomes, including software and R&D, we will provide new added value to customers by offering new Growth will come from higher unit prices and the development of new business areas, as well as from an increase in the number of customers in overseas markets (e.g., increased exports).
  - We will not compete in the same areas as U.S. companies that dominate the world in the digital field, but will leverage our strengths in the manufacturing industry, which we cultivated during the high-growth period and still have a full lineup in Japan despite the progress of overseas investment, to develop green technology, structuring of unstructured data in the manufacturing field, and unique Establish a cycle of user data analysis and value provision in the area.
  - In addition, digitalization, which was revealed to be slow to be introduced in various fields during the Corona period, will progress in a catch-up manner, with SMEs and other companies at least working on what is already in progress in other countries and companies. Given the excellent human resources that have been able to handle the process with careful human response without the use of digital, and the fact that there is no need for trial and error due to the fact that they are ahead of the curve, digital utilization will be smoother than in other countries.

[47] See Reference Materials P54

- The importance of leading medium enterprises, SMEs and start-ups, which have growth potential and are playing important role to change, will increase, and these agents of change will also provide the stimulus for change in large companies[48].
- The Japanese economy, defined in the physical realm, as one of the regions with a declining population, will attract domestic and foreign companies, generate investment, and consumer consumption, led by the attraction of high values created, not by "the strength of total demand driven by population growth".
  - Even in areas where the domestic market is shrinking in existing businesses, labor supply is shrinking faster under the structural labor shortage based on the declining birthrate and aging population, so labor productivity will increase even in a shrinking market size if the shortage of supply capacity is compensated for through labor-saving investments and other measures to steadily acquire demand. The composition of personal consumption will increase among the elderly (especially women) as their life expectancy increases.
- From this perspective, the government will continue industrial policies as national strategic investment destination that will make both domestic and foreign companies select "Japan" as the investment destination.

③ The Future Outlook of Overall industrial structure (Competing on the world stage)

- From here, we will describe the changes in Japan's industrial structure, dividing it into two categories: "industries that compete in the global marketplace" and "industries that take on the challenge of improving the quality of life.
- First, there are two types of "industries competing in the global marketplace": world headquarters and world factories.

i. "Global Headquarters" (management, business, and product/ service strategy planning and the most important R&D bases), as a result of "selection and concentration" mainly to solving social issues, the high value-added creation functions such as management, business, and product/ service strategy planning and the most important R&D bases to continue creating high value-added products and services will be retained and strengthened in Japan. To this end, profits earned around the world will be continuously returned to the domestic market as a source of funds for further future investment.
   - Establish a high value-added x green industry that ensures appropriate speed and agility from a GX perspective. In green markets, R&D will be developed into technology exports and green energy will be aggregated to produce and export globally competitive green products and create domestic demand. In non-green markets, flexible production systems in regions and products where demand remains (assuming that exports basically cannot retain cost competitiveness, since emerging markets will be the main focus) will be ensured. A reliable analysis of market trends (green/non-green markets x domestic/external spread) is a prerequisite for achieving these goals.
   - Strategic retention of products, technologies, and data as choke points from an economic security perspective.

[48] See Reference Materials P55

ii. "Global Factory" (a base for structuring unstructured data and acquiring data and service revenues and expenditures through its global expansion), establish a cooperative system to collect and analyze unstructured data from manufacturing sites widely within the industry and apply them to the next stage of R&D. Become a global center that continues to provide products and services, both domestically and internationally, that deeply understand customer needs, have higher added value, and are sought after as indispensable products and services by people around the world.

- Rebuilding the "global factory": Structuring the unstructured data that lies dormant at the manufacturing site and improving manufacturing capabilities to meet various challenges such as individualized needs and GX. With the selection and concentration of global companies through the shift to global headquarters (including the development of international division of labor through local production for local consumption), not only the domestic business bases of global companies themselves, but also the entire supply chains of their business partners, especially the pressure for high value-added to domestic bases will increase, so domestic companies and business bases with low added value that can be replaced by bases in other countries If GX and DX can be proactively incorporated and linked to added value, they will gain an important position in the reconfiguration of the domestic supply chain.
- Creation of advanced markets: Create world-leading advanced markets by leveraging data from unique end-consumers, taking advantage of its position as a developed country with aging population and other issues.

- Maintaining and strengthening the competitiveness of its business in Japan as a world headquarters and world factory, an area where companies can procure the industrial infrastructure and human resources necessary for high value-added businesses in the face of international competition.

④ The Future Outlook of Overall industrial structure (Industries challenging to improve Quality of Life)

- There are two ways that "industries that take on the challenge of improving the quality of life" can be: value-added creation, including globalization of local industries (good things come at a price), and labor-saving, starting with structural labor shortages and technological innovation in local industries.

i. Value-added creation, including globalization of local industry (Realization of business where good products and services come at a price)

- New products and services will emerge one after another that are optimized for the individual (e.g., utilization of Personal Health Record (PHR)) and free individuals from time and space constraints (e.g., AR, VR, automated driving, etc.). by utilizing digital technologies and data linkages with zero marginal cost.
- Establish a model for earning both inbound (e.g., tourism) and outbound (e.g., exports of other industries with the power of content as a source of additional competitiveness), targeting inbound and outbound travel with the power of lifestyle, culture, and content as the source, in order to capture the "leisure satisfaction" market created as a result of relaxation of time and space restrictions. Establish a model for earning both inbound (e.g., tourism) and outbound (e.g., exports

from other industries with content as an additional source of competitiveness) by leveraging Japan's lifestyle, culture, content power.

- As a result, a positive cycle of establishing a profit structure and improving the quality of living infrastructure in a broad sense, including logistics and human flow, will occur.
  In other words, the establishment of a profit structure is a prerequisite for the development of high-quality living infrastructure, and the establishment of a profit structure generates resources, enabling investment in living infrastructure.
- The development of the content and tourism industry will also contribute to improving the sustainability of pure and domestic market industries (transportation, real estate, etc.).

- In addition to the tourism and content industries, examples of industries that have previously targeted domestic consumers expanding into international markets (e.g., apparel industry) by securing customer contacts digitally will also become standard.

ii. Labor-saving starting from structural labor shortage and technological innovation in local industries

- Build a system where companies that can save labor through digital investments (AI, robots, etc.) can resolve labor supply (input) constraints caused by structural labor shortages and meet growing demand for services (output) such as medical care, nursing care, and tourism without losing sight of the need for such services.
- Companies that can improve productivity through value-added creation and labor-savings, will be able to hire, invest in, and continue to operate with valuable young human resources as companies that are can continue to raise wages.
- Even in depopulated areas where the sustainability of the service supply is in jeopardy, companies that can raise the price per customer will not lose customers, demand will continue, and they will be able to continue acquiring human resources and investing in equipment.

4. Changes in Existing Individual Industries

- Since this document assumes that the Future Outlook will be drawn as an extension of the New Direction of Economic and Industrial Policies, the Future Outlook for individual industries is presented based on the industrial classification underfoot, rather than envisioned based on the industrial classification that could exist in the future.
- Individual industries are then classified into three categories: ①industries affected by the five missions (GX, DX, economic security/global, health/regional inclusive growth (declining birthrate, aging population), ②industries with the highest percentage of GDP and employment structure underfoot (in 2020[49]) and in the future (around 2040[50]), ③industries that the Ministry of Economy, Trade and Industry (METI) can reach.
- Note that around 2040, as indicated by individual industries, the industrial classification and spillover relationships among industries may change, such as the increase of "other service industries" that are not classified under the current industrial classification, such as the development of value-added services derived from the manufacturing industry.

(1) Semiconductors and Computing powers

Key Points

- The advancement of DX and GX will increase the demand for semiconductor and computing powers worldwide, as well as the need for improved performance.
- From the perspective of economic security, the semiconductor supply chain must continue to be made more robust. To this end, it is necessary to take actions appropriate to the type of semiconductor, such as continuing large-scale investments and ensuring technological superiority through R&D and measures to prevent technology outflows, etc.
- Generative AI and other innovation tools will be widely used in the economy and society, and the development of computing powers and data for their development and utilization will be key.
- It is necessary to promote human resource development, etc. for the development of such semiconductor production sites and computing powers.

＜Changes in the overall global demand structure＞

- Demand for semiconductors will continue to grow as a medium- to long-term trend, influenced by DX and GX (although demand fluctuates in the short term due to the silicon cycle).
- Generative AI is rapidly being utilized in all areas of economic and social systems, forming one of the most important social infrastructures as well as cloud computing. In line with this, the importance of computing powers and data maintenance, which are indispensable for the development and utilization of generative AI, will further increase and demand will grow.
- Semiconductors will be incorporated into products that currently do not incorporate semiconductors, and even products that currently incorporate semiconductors will see their number and performance increase. Furthermore, the amount of information processing on the cloud side, which processes data sent from these edge terminals, is also exploding. Demand for semiconductors and computational resources will expand as the digital infrastructure for high-

[49]Cabinet Office, "SNA"
[50]JILPT, "FY2023 Future Projection of Labor Demand and Supply"

volume, high-speed information processing, and technological innovation of computing powers using new methods such as quantum technology will also progress.

- In terms of GX, demand for semiconductors required to control green-related products such as electric vehicles will increase. In addition, demand for high value-added products will increase due to the need to improve the performance of semiconductors that improve energy efficiency in order to suppress the increasing power demand resulting from the progress of DX and AI. In particular, demand will increase for specialized semiconductors (ASIC) designed specifically for each user and application with high power consumption efficiency, rather than general-purpose products.

＜Changes in the overall global supply structure＞

- In terms of semiconductors, where an economic security response to threats and risks will be necessary even around 2040, from the perspective of economic security, the supply system should be self-sustaining, either by building a supply system within the country itself or through cooperation among volunteer countries and regions.
- In the case of advanced logic semiconductors required for AI, etc., the global market is dominated by a few fixed companies due to the huge amount of capital investment for R&D and manufacturing, etc. In the case of ASIC design, the amount of money required for design and development is increasing, and limited users with financial or technical capabilities will be responsible for this.
- As for advanced memory semiconductors used for data storage, companies that can continuously achieve higher capacity and lower power consumption through continuous capital investment and R&D will gain a competitive edge.
- On the other hand, in front-end processes, miniaturization and stacking in accordance with Moore's Law are reaching their limits, and back-end processes are becoming increasingly important. In particular, advanced packaging technology that integrates semiconductors with different functions on the same chip and efficiently links them together will become an indispensable technology. Companies that develop advanced materials, packaging technologies, etc. will gain added value, and from the perspective of economic security, the importance of securing manufacturing infrastructure for advanced packaging will increase.
- At the same time, innovative technologies such as optoelectronic fusion technology and memory-centric technology are being implemented.
- For industrial specialty semiconductors such as power semiconductors, which are responsible for power conversion, R&D capabilities will be the key to gaining market share for high-end products that use new high-performance materials such as gallium oxide and diamond. As for low-end, general-purpose semiconductors, China and the Global South are increasing their market share, while the market segment is fragmented according to application, with many niche companies.
- The market for semiconductor manufacturing equipment and materials for semiconductor production equipment and parts has grown significantly in line with the growth of the market for semiconductors themselves. In addition, players will change in line with the changes in the semiconductor market described above and changes in the international environment, such as PFAS regulations.
- In the area of computing powers, the demand for digital infrastructure for mass and high-speed information processing is expected to expand due to the wide use of innovation tools such as

generative AI in the economy and society, etc. In light of this, domestic development of computational resources for AI (for development and inference) and research and development of computational resources with an eye to power saving and efficiency improvement are also expected to expand. Research and development is also expected to expand.

＜Changes in Japan's business structure＞

- The Japanese semiconductor industry, which boasted the largest global market share in the 1980s, has since lost a large share of the market. In particular, the production base for advanced logic semiconductors did not exist in Japan until TSMC and JASM entered the Kumamoto market. Therefore, in order to revive the semiconductor industry and to strengthen the supply chain from the viewpoint of economic security, we have been implementing support measures for bold and prompt capital investment and R&D investment, and if we can continue to promote investment, our business structure will be as described in (Product Supply Structure) below, and we will be able to secure a global semiconductor production The company has been able to secure a share of more than 15% in the global semiconductor production.
- It should be noted that it is extremely difficult for a single country to cover the supply chain of semiconductors alone, and it is important to collaborate with volunteer countries and regions to ensure a stable supply of semiconductors, etc.
- In addition, as a key technology for solving various social issues and for social development, such as improving productivity and resolving labor shortages, the use of generative AI is expected to increase in various industries and fields of the economic and social system, and, like the cloud computing, will be regarded as an important part of social infrastructure. For this reason, support measures for capital investment, R&D investment, and development environment improvement are being implemented at an unprecedented pace to strengthen domestic development capabilities of generative AI and promote its utilization, and if investment can be promoted in the future, the share of AI models originating in Japan will expand and a stable supply of social infrastructure can be secured. The company has been able to ensure this.

(A supply system)

- Japan will export high value-added products overseas by promoting R&D in areas where disruptive technological innovation is advancing or where it has a technological advantage, and by collaborating with volunteer countries and regions to prevent the outflow of core technologies, thereby continuously securing its technological advantage over other countries and regions.
- From the perspective of economic security, prevent and correct the structure of over-dependence on certain countries and regions while developing domestic production bases to fill missing pieces in the supply chain.
- A certain amount of production capacity for advanced logic semiconductors will be secured domestically for each node, respectively. In particular, a certain share of the global market will be secured through domestic mass production of next-generation semiconductors (2nm and Beyond2nm), subject to sustainable financing and government measures to prevent governance and technology outflows. In addition, ASIC design and development will progress at domestic user companies, etc., and a virtuous cycle between design and foundries in Japan will be established.

- In advanced memory semiconductors, we will continue R&D and capital investment in both NAND and DRAM and secure a certain share of the market for high-speed, compact, and power-saving products. In addition, mixed memory technology, which is essential for advanced logic semiconductors, and spin-tronics and other technologies will be developed, put to practical use, and put into mass production.
- In addition, game-changing innovative technologies such as optoelectronic integration technology and memory-centric technology will be developed, commercialized, and mass-produced.
- In advanced packaging technologies, development of optical chiplet and analog-digital mixed-integration SoC (system-on-chip) technologies will progress to practical application, and domestic production bases utilizing these technologies will be established.
- Among specialty semiconductors for industrial use, in the area of power semiconductors, technological development of high-end products using new high-performance materials such as gallium oxide and diamond will progress, leading to their commercialization. In addition, Japanese companies will increase their market share per company while also focusing on these new technologies. For other low-end power semiconductors and microcontrollers, the structure of excessive dependence on specific countries and regions will be prevented and corrected. For analog semiconductors, adopt a niche strategy in market segments segmented according to application, with several top global niche companies.
- For semiconductor manufacturing equipment and section materials, promote R&D in areas where disruptive technological innovation is advancing or where the company has a technological advantage, and collaborate with volunteer countries and regions to prevent the outflow of core technologies, thereby ensuring continued technological superiority over other countries and regions to create high value-added products for Exporting overseas.
- Generative AI models will be advanced by promoting R&D of models as well as the development of computational resources and data essential for their development and utilization, so that a variety of models originating in Japan will be used in various industries, fields, and regions (increasing the market share of Japanese companies), which will also lead to the advancement of models. This will also lead to the advancement of models. In addition, as the utilization of AI advances, research and development will be conducted to further advance the sophistication of computing resources (higher efficiency and power saving). This cycle will build an ecosystem on the utilization side and the supply side of computational resources.

(Constraints to supply)

- In a society with a declining population, infrastructure development, including water, sewage, and roads, will be an issue in promoting large-scale semiconductor investment projects, and will be developed in cooperation with local governments.
- Lack of semiconductor human resources is also an issue. Regarding human resources at manufacturing sites, industry-academia-government collaboration on a regional basis, tailored to regional characteristics, will be used to expand the pie. In addition, we will foster high-level human resources for next-generation semiconductor design, research and development, etc., while incorporating overseas knowledge, and promote collaboration with volunteer countries and regions.

- In addition, a shortage of software human resources is also an issue. There is a global shortage of software human resources, which are indispensable for the future promotion of corporate DX, and the competition for human resources is intensifying. Therefore, in Japan, the industry, government, and academia are actively working to develop digital human resources and expand the pie by reskilling working professionals and strengthening digital human resource development functions at universities and technical colleges. In addition, improving the labor productivity of individual software human resources is also an issue. We will work to create high value-added services by improving per-capita labor productivity through the use of advanced technologies such as generative AI.

(2) Automobile and Mobility

Key Points

- The CASE trend is advancing, with GX (electrification / fuel decarbonization) and DX (digitalization) in the automotive sector.
- Electrification is advancing. On the other hand, the progress will vary from region to region and country to country due to the varying needs of electric vehicles in each region, etc. A considerable amount of demand for internal combustion engine vehicles is expected to continue.
- The spread of FCVs, especially for heavy-duty vehicles, will continue along with the construction of hydrogen infrastructure, and technological innovation in decarbonized fuels will progress, leading to the use of internal combustion engines in a carbon-neutral manner.
- The digitalization of automobiles will progress and the social implementation of software-defined vehicles (SDVs) will advance, diversifying the ways in which automobiles are made and used. In line with this, added value of automobiles will be created not only from the performance of the vehicle body, but also from services (so-called MaaS) through contact with consumers, such as travel experiences.

＜Changes in the overall global demand structure＞

(GX)

- While the electrification of passenger cars and other vehicles is progressing in the global market toward carbon neutrality, the progress is different in each region and country of the Global South, including Europe, the United States, China, and ASEAN, as the needs and energy conditions of electric vehicles in each region are different. differently.
- In addition, due to differences in the progress of infrastructure development, a considerable degree of demand for internal combustion engine vehicles is expected to continue, particularly in developing countries and non-urban areas.
- As a result, a substantial number of internal combustion engine vehicles will remain in the global stock base.
- The use of internal combustion engines in a carbon-neutral form will increase as FCVs, especially heavy-duty vehicles, become more widely used in conjunction with the construction of hydrogen infrastructure, and technological innovation in decarbonized fuels progresses. The challenge is to address the increased burden on users associated with the shift to decarbonized fuels.

(DX)

- As the way of car ownership (“from ownership to use”) and consumption (“from hardware to software, services, and contents”) are transforming, the digitalization of cars (SDV (Software Defined Vehicle)) will create a variety of user needs and social It will create applications for solving issues and continuously create new business opportunities in the mobility sector.
- A wide variety of needs for personalized services will be created through post-sales contact with consumers.
- Users will be freed from driving as automated driving technology becomes more sophisticated, and will seek services associated with the mobility experience, with a primary focus on how to get around and how to spend their time traveling.

- The need for mobility that contributes to solving social issues arising from population decline and other factors will increase through labor savings and efficiency gains from digitalization and automated driving technology. The need for smart mobility will increase, especially in human flow and logistics in rural areas.

- Global economic growth and the increasing significance and attractiveness of such mobility in society will increase the demand for automobiles themselves.

＜Changes in the overall global supply structure＞

(GX)

- Japanese automakers will also establish supply structures in EVs, both domestically and internationally. In particular, they will be ahead of the curve in responding to markets where green is a prerequisite for market entry.
- Since internal combustion engine vehicles will account for a decreasing share of the total, the supply chain will be streamlined, including the supply of parts to vehicles that remain in stock.
- In business decisions on the location of production bases, companies will focus on the stable supply of clean energy and economic rationality, taking into account the policies of each country in terms of both regulation and promotion.
- A CO2 management system for the entire global supply chain will be established from the perspective of reducing CO2 emissions not only during driving but also throughout the entire life cycle.
- A circular economy ecosystem in the automotive sector will be established through the expansion of the venous industry, including the efficient recovery of materials from automobile parts and a recycling mechanism for batteries.

(DX)

- As the shift to SDV in automobiles progresses, software will account for a high proportion of the source of added value created by automobiles.
- The automotive and mobility value chain will expand through the use of mobility-related data and OTA functions, leading to the entry of players from other industries into the automotive and mobility field, as well as the cross-border expansion and deployment by automakers into other business fields.
- Automation and labor saving will increase, including integration (e.g., gigacasting) and renewal (e.g., self-driving lines) of production processes in response to a declining workforce.
- Vehicle development will become more efficient through the use of data and generated AI, and the cycle of research and development of hardware as well as software will speed up.
- Automated driving, one element of SDV, will see accelerated technological innovation and advancement as a means to open up use cases for MaaS, for example, as a technological element for freedom from constraints during travel time.
- The importance of training and acquiring software human resources, from design to development to maintenance, will increase in line with the changes in the sources of added value described above. Competition for human resources will be fierce, as other industries also have high needs.

＜Changes in Japan’s business structure＞

- As business continues to diversify and become more sophisticated in both GX and DX, Japanese automotive companies will be at the forefront of competition in the global mobility industry by leveraging their respective strengths in the markets and segments targeted in each company’s strategy.
- As digitalization extends the value chain to the post-sale stage, each company will diversify its sources of competitiveness and realize diverse ways of earning by acquiring the necessary core technologies through the transformation of their respective CX and other business models.
- Companies will choose vertically integrated or horizontally divided supply chain strategies to secure competitiveness. In the process, diverse players, including start-ups and players from other industries, will enter the industry and promote inter-company collaboration, which will intensify competition in the automotive and mobility industry. Competition in the automotive and mobility industry will intensify.
- In a vertically integrated model, the automotive industry as a whole can survive in international competition by investing in strategic commodities such as batteries and semiconductors on a necessary scale.
- While taking appropriate measures to address the uneven distribution of resources and supply chains and the impact of geopolitics, Japan will maintain the size of its domestic market by creating diverse needs, while enhancing the business environment conducive to domestic production of highly competitive vehicle models and critical components, and by promoting charging infrastructure, In the expanding global market, Japan will also secure its position as an export base for EVs.

(3)Batteries

Key Points

- Batteries will be polarized into two types of products: those that become commoditized and price competitive, and those that provide high added value by ensuring technological superiority, etc. The latter includes values such as safety and sustainability of batteries, which are tailored to the needs and performance requirements of the end product.
- From the perspective of economic security, sensitive technologies will be thoroughly prevented from leaking out, and batteries that support domestic infrastructure will increasingly be manufactured at domestic sites.

＜Changes in the overall global demand structure＞

- Demand for batteries will grow globally for both vehicle-mounted and stationary applications.
- Demand for vehicle-mounted batteries will increase due to the expansion of the EV market in line with the progress of global CN initiatives.
- Demand for stationary batteries will increase in response to global CN initiatives, as well as for increased private consumption in homes and factories in line with the introduction of renewable energy and for use as backup power sources for data centers and other critical facilities. Among stationary batteries, demand for grid batteries will increase as a regulating force to contribute to the stabilization of the power system, in line with the growing use of renewable energy. Similar to stationary batteries, vehicle-mounted batteries will also be used as a regulating power source.

＜Changes in the overall global supply structure＞

- With the progress of R&D, batteries will be polarized into ①products that become commoditized and price competitive and ②products that provide high added value by securing technological superiority and other advantages.
- Policy support for automotive batteries will lead to expansion of supply capacity and research and development. Liquid lithium-ion batteries will become a commodity, while the performance of low-cost batteries such as LFPs will improve, and global price competition will intensify. All solid-state batteries will be commercialized and supplied through R&D. Furthermore, as the next generation of batteries, research and development will be conducted from the perspective of further improving energy density and reducing resource constraints and costs.
- Stationary batteries will become commoditized through increased supply and R&D, resulting in price competition. On the other hand, the introduction of a variety of batteries, not limited to lithium-ion batteries, will progress according to the needs and performance requirements of end products, and there will also be a move toward evaluating not only price but also the safety and sustainability aspects of batteries.
- In addition, both vehicle-mounted and stationary batteries are required to track CO2 and consider human rights and the environment against the backdrop of environmental regulations, particularly in developed countries. In parallel, international calculation rules and third-party verification mechanisms will be established. Companies will use the data linkage infrastructure to track CO2 emissions and the status of consideration for human rights and the environment throughout the battery supply chain, in cooperation with related industries.

- Furthermore, for both vehicle-mounted and stationary batteries, securing mineral resources and materials will become a necessary element of supply capacity against the backdrop of the concentration and rising prices of raw material mineral resources in certain countries. In addition to securing interests in upstream resources, companies will focus on building a recycling system and improving recycling technology for batteries.

＜Changes in Japan's business structure＞

- Japanese firms secured the initial market for liquid lithium-ion batteries with their technological superiority, but their market share was declining as foreign firms rapidly expanded supply, backed in part by government support, and competition to attract and invest in related industries and companies intensified. The liquid lithium-ion battery market was expected to continue for the foreseeable future, and if this trend continued, Japanese companies would become exhausted and withdraw from the market, forcing them to rely on overseas suppliers for batteries. Therefore, in order to strengthen the battery manufacturing supply chain in a competitive manner, Japan has implemented large-scale capital investment and production technology development support for batteries, materials and manufacturing equipment, formation of global alliances, development of next-generation technologies, and support for human resource development. If the public and private sectors continue to work together to strengthen the competitiveness of the battery industry, capital investment by companies will increase, and the goals established in the Battery Industry Strategy (August 2022) (securing a domestic manufacturing base of 150 GWh/year and global manufacturing capacity of 600 GWh/year by 2030) will be achieved, and the necessary Secure the supply capacity of batteries. Furthermore, since all solid-state batteries are a product with technological superiority, from the perspective of economic security, the company will prevent the outflow of sensitive technologies while acquiring high added value in the international market.
- For automotive batteries, maintain and improve competitiveness in the international market by establishing a mechanism to globally manage CO2 emissions and the status of human rights and environmental considerations in the entire supply chain of batteries through a data linkage infrastructure that utilizes DX.
- Stationary batteries, especially those for grid storage and for backup power sources for critical infrastructure such as data centers, will be increasingly manufactured at domestic sites if they are used domestically from the perspective of economic security.
- In order to increase their competitiveness in terms of cost, delivery time, and other factors, manufacturers of manufacturing equipment for these batteries will increase their production scale by building alliances and other means to promote cooperation among companies.
- In addition, since the key minerals used for batteries are important from the perspective of economic security and resource recycling, in addition to efforts to secure interests in upstream resources, diversification of procurement sources, establishment of domestic infrastructure for smelting processes, and introduction of technologies and mechanisms to efficiently recover batteries will progress.
- As these battery-related industries develop, industry, government, and academia will work more closely together to eliminate bottlenecks to growth in regions with advanced industrial clusters, thereby strengthening industrial competitiveness.

- In addition, in order to secure manufacturing capacity for batteries, the importance of training and securing battery personnel will increase, and the overall level of human resources related to batteries, from research to the field, will be raised.

(4)Industrial Machinery & Robots

Key Points

- Demand for machine tools, construction machinery, and industrial robots will continue to grow along with economic growth. While the transition to carbon neutrality and labor-saving investments to compensate for domestic labor shortages will be of new value, supply chain augmentation based on economic security frameworks and other factors will continue amid geopolitical tensions.
- In robotics, as the new user market continues to expand, the separation of domains will increase and the role of the robot as a tool for data-based optimization of production processes will expand. Development will accelerate in response to the shortage of robot SIers.
- Increased collaboration with vendors and startups with AI and sensing technologies to collect and standardize inter-device data for factory-wide optimization and business model transformation in small and midsize manufacturing companies.
- The market for service robots will expand significantly, and companies with strengths in AI and other software technologies will accelerate their entry into the market in order to achieve efficient control of these robots.

(Industrial Machinery and Industrial Robots)

＜Changes in the overall global demand structure＞

- Around 2040, global demand for industrial machinery and industrial robots, including machine tools, construction machinery, air-conditioning equipment, and measuring and analysis equipment, will continue to grow with economic growth, and these manufacturers will accelerate their global expansion in order to capture overseas demand.
- The growing need for GX equipment to meet the transition to carbon neutrality will drive the introduction of GX construction equipment (EVs, synthetic fuels, hydrogen) and heavy electric equipment (gas turbines, etc.) for hydrogen and ammonia utilization, not only in Japan but also globally. In addition, in Asia and Africa, represented by the Global South, Japanese air conditioning equipment (heat pumps and boilers), motors, compressors, and other general-purpose industrial machinery with excellent energy-saving performance are becoming more widespread, and along with the expansion of the market for such equipment on a stand-alone basis, the value associated with the progress of digitalization that meets consumer needs will increase. Companies that respond to the shift in sources (servicing) will continue to have an advantage in the market.
- In Japan, the competition for human resources will intensify and it will become difficult to hire workers to manufacture products as the working population will decrease by approximately 20% from the current level around 2040. As a result, each manufacturing industry will face a growing sense of urgency to improve productivity through labor-saving investments, including industrial robots, and to improve the treatment of employees through higher wages, etc. In order to compensate for the labor shortage caused by the declining population, demand for industrial machinery and industrial robots will increase. In response, the need for robot systems that can respond to labor-saving needs in all industries will also increase, and platforms will be built to

accelerate the development of new production systems and linkage between devices using various data from production, quality control, and other areas.

- As for robots, the market will expand not only with existing users such as major automakers and semiconductor manufacturers, but also with new users such as small and medium-sized companies and food manufacturers. In the former market, the establishment of advanced AI and handling technologies will enable automation of tasks that are currently difficult to perform with robots (e.g., wiring and assembly of wire harnesses). In the latter market, user value will shift to robot systems that are overwhelmingly user-friendly (e.g., easy to install, easy to operate), rather than to the high accuracy of the robots themselves. In addition, the value of robots will shift from simply being automated and labor-saving devices to being DX tools that utilize data obtained from the robots and their peripheral equipment.

＜Changes in the overall global supply structure＞

- On the other hand, geopolitical tensions are likely to continue, increasing the need for manufacturers to reduce vulnerabilities and potential risks in their supply chains. To this end, the public and private sectors will work together to strengthen production capacity and research and development for stable supply through economic security frameworks and other measures. In high-performance machine tools and industrial robots, the domestic supply chain for core components and technologies related to precision and quality will be strengthened, appropriate technical information management will progress, and competitive advantage and autonomy will be maintained and continued competitive advantage and autonomy will be maintained.
- As companies become more global in their management with plans to capture overseas markets, they will be required to diversify their regions, businesses, and human resources, and to respond to new value axes such as GX, ESG, sustainability, and supply reliability by investors and consumers. In the Global South, for example, the formation of rules and human resource development for manufacturing and maintenance of air-conditioning equipment, etc., in cooperation with the public and private sectors, will further encourage local expansion, and the market share of Japanese products will increase further.
- In the area of robots, in addition to the traditional competitive focus on accuracy, durability, and stability to enable high productivity at production sites, there is also a need for robot systems that can be operated by non-experts to speed up production at all production sites around the world, which has led to a focus on ease of design and ease of installation. In addition, there will be an emphasis on ease of design, ease of installation, and ease of use. The two will become more and more distinct among and within companies in the industry.
- As the competitive axis changes relatively, with respect to the value provided by industrial machinery and robots, they will play a greater role as tools for optimizing production lines and increasing the efficiency of the entire factory based on data collected from the field.
- In addition, as demand expands explosively, there will be a shortage of robot SIers, competition for SI personnel will intensify, and the development of robot systems and SI technology to reduce SI costs (man-hours) will accelerate.

＜Changes in Japan's Business Structure＞

- Overwhelming labor-saving investments (robots, machine tools, etc.) are proceeding in response to the domestic shortage of human resources. In order to cope with the explosive increase in labor-saving investment, development of robot systems that can be easily deployed horizontally and are more versatile and scalable will progress, rather than technologies that create individually optimized, one-of-a-kind robot systems.
- In parallel with labor-saving investments in industrial machinery and robots, the source of added value will shift to the ability to design and optimize the entire factory as a centralized system. Specifically, the value provided is the optimization and advancement of production systems, such as efficient collection of operating and motion data from each piece of equipment, yield improvement, predictive maintenance of equipment, product defect detection and traceability, and flexibility to immediately respond to changes in workpieces and lines.
- In addition, the integration of IT and robot systems will continue in order to realize high-performance DX that enables optimization and sophistication not only of production systems, but also of all processes from product design to manufacturing, inspection, and shipping. Robot SIers that can also integrate IT will expand. In addition, as robots penetrate and expand in areas where they have not yet been introduced, vendors and start-ups with AI and sensing technologies that complement and augment robot operations will emerge, accelerating collaboration and open innovation with robot manufacturers.
- In order to realize such value, it is necessary to collect homogeneous dynamic data in real time among various devices such as machine tools, inspection equipment, and robots (arm robots, AGVs, etc.), and the devices themselves must be connected to other devices as a precondition for providing value. In order to achieve this, a certain level of standardization is required for the sensing and data generation, transmission, and reception methods (extensions and communication I/F) of each device.
- In order to realize such value, it is necessary to collect homogeneous dynamic data in real time among various devices such as machine tools, inspection equipment, and robots (arm robots, AGVs, etc.), and the devices themselves must be connected to other devices as a precondition for providing value. In order to achieve this, a certain level of standardization is required for the sensing and data generation, transmission, and reception methods (extensions and communication I/F) of each device.
- The realization of a platform based on the accumulation of such dynamic on-site data will also contribute to boosting the global expansion of set manufacturers (Tier 0 to 1) and creating new business opportunities for the small and medium-sized manufacturing companies that support them (assuming Tier 2 to 3 suppliers). For example, the automation and data integration of all processes from design to manufacturing and inspection will enable production control and quality confirmation through remote monitoring. Such a system will enable Tier 0-1 manufacturers to replicate the technologies of existing suppliers (Tier 2-3) and maintain quality and productivity locally as they expand overseas production in the face of accelerating labor shortages among domestic suppliers. For suppliers, this will lead to the creation of new business opportunities in the data business.

- In addition to the construction of such a platform, global automated production lines will be realized as related technologies such as remote communication technology and AI-based on-site condition monitoring are deepened. For example, even production lines located outside of Japan can be monitored and controlled by a central organization, such as the head office, to achieve the same productivity and quality as domestic production sites, with robot systems that can remotely restore operations when problems occur.

(Service robots)

＜Changes in the overall global demand structure＞

- Due to the demand for labor-saving in a declining population and replacement of hazardous work, robots with various applications and functions are needed in a wide variety of industries, including food service, retail, lodging, logistics, nursing care, construction, agriculture, and other primary industries. The expansion of these application areas will make this a growing market that exceeds that of industrial robots.
- Robots used in these areas must be able to "coexist with people". AI robots must be able to understand the language (natural language) of the people they work with, make autonomous and accurate judgments and actions, and perform tasks and provide services together with people.
- On the other hand, the deepening of ICT and telecommunication technologies will dramatically expand the range of applications of remote robot operation, not only promoting social implementation of robots, but also transforming the way employees work and are employed in various industries. For example, AI robots can be used as communication tools for on-site customers, while robot operators can provide service support remotely, enabling them to provide high-quality work and services regardless of where they work or their abilities.

＜Changes in the overall global supply structure＞

- In addition to robots whose primary function is to "move and run" such as for food delivery, cleaning, and security, which are currently being implemented, there is a need to provide robots with functions to perform "tasks" like humans while also providing high recognition and decision-making capabilities through AI.
- Robots that specialize in "moving and running" will become commoditized, and the axis of competition will shift from the function of the robot alone to its linkage with buildings and other facilities and its ability to simultaneously control robots of different manufacturers and for different applications. In order to realize such a system inexpensively and simply, a robot-friendly environment will be further developed.
- Robots that perform human-like "tasks" will require low-cost, easy-to-operate manipulation mechanisms and safe, soft hardware that can coexist with humans. In addition, advanced AI technology will be further integrated to enable complex tasks, accelerating the entry and emergence of companies with strengths in AI and other software technologies rather than robot manufacturers.
- In addition, as the realization of AI robots advances, the added value will shift to robot control OSs centered on multimodal underlying models to enable natural language decisions and actions.

The emergence of such an OS will accelerate the development and deployment of robot applications targeting various domains.

＜Changes in Japan's Business Structure＞

- In both the "moving and " robot domains, the source of competitiveness will be attached to companies that possess communication and AI technologies, and competition to acquire such technologies will intensify. As a result, robot manufacturers will accelerate collaboration with startups that possess such technologies. In addition, as the development of AI and other software domains, including basic models, becomes more active both in Japan and overseas, the players that can quickly develop and implement applications, including hardware, and service models using these applications will be competitive.
- In order to form and capture new markets ahead of other countries, a social system that realizes "high-cycle innovation" is required, whereby the developed technology is introduced to the market at a certain level of establishment, and the degree of perfection is raised through repeated feedback from users and improvement of the technology and products. The social system that realizes "high-cycle innovation" is required.

(5) Aircraft and Next Generation Air Mobility

Key Points

- In the airframe business, Japanese aircraft industry will participate in the joint development of subsystems and business integration in the growing single-aisle aircraft market. In addition, we will apply new environmental technologies to next-generation aircraft for the purpose of decarbonization. In the engine business, the Japanese industry will collaborate with overseas OEMs from upstream processes such as conceptual design to establish leadership in the overall program, leveraging its leading technology development, manufacturing efficiency, and domestic supply chain.
- In addition to promoting the establishment of domestic aircraft supply chains in fields where Japan has strengths, we will promote local expansion in the Asia-Pacific region, including the countries of the Global South, and establish international supply chains.
- Engage other industries triggered by emerging markets such as Advanced Air Mobility (AAM) and promote the entry of new startups with innovative technologies such as Additive Manufacturing.

＜Changes in the overall global demand structure＞

- Global air passenger demand is expected to increase at an annual rate of 3-4% and reach approximately double that over the next 20 years. The industry is expected to have significant growth potential, with new sales of commercial passenger aircraft worldwide projected to reach approximately 26 trillion yen/year by 2041 (2016-2018 average: approximately 16 trillion yen/year). Against the backdrop of increasing passenger demand, significant growth potential is expected in various businesses that support air transportation, including aircraft manufacturing, maintenance, repair, and overhaul (MRO).
- Specifically, the market size is estimated to grow from 8.6 trillion yen/year (2016-2018 average) to 16.5 trillion yen/year (as of 2041) for single-aisle aircraft and from 7.7 trillion yen/year (2016-2018 average) to 9.9 trillion yen/year (as of 2041) for twin-aisle aircraft, based on new global commercial aircraft sales. In addition, the current situation is that some countries are supporting the development and manufacture of the world's major aircraft, and it is important from the perspective of enhancing Japan's economic security and industrial competitiveness to maintain and acquire a business environment and industrial base that will enable the development and manufacture of aircraft. In addition, since synergistic effects can be expected with defense aircraft, which play a key role in Japan's national security, it is important to develop and strengthen the supply chain as a common foundation for both the civilian and defense sectors.

(GX)

- Regulations regarding carbon dioxide emissions from international flights have agreed upon targets for achieving 2050 carbon neutrality (International Air Transport Association (IATA) in October 2021 and International Civil Aviation Organization (ICAO) in October 2022). In order to achieve carbon neutrality in the aviation industry by 2050, the introduction of Sustainable Aviation Fuel (hereinafter referred to as "SAF"), efforts to introduce new technologies and to improve flight operation methods will accelerate, along with efforts to introduce SAF. It will be difficult to achieve the goal with the current fleet, and new technologies will need to be applied, but these changes will also provide an opportunity for Japan to strengthen its competitiveness.

＜Changes in the overall global supply structure＞

- The value of stable supply by companies with a certain level of supply capacity has increased in response to changing circumstances, such as increased logistics and raw material costs associated with Russia's invasion of Ukraine, a move away from dependence on specific countries, and a shortage of materials for parts due to the slow recovery of the labor force, which shrank significantly due to the Corona disaster.

(GX)

- Decarbonization of the aviation sector will require a combination of various options, such as SAF, improved operation methods, and introduction of new technologies (hydrogen use, increased electrification rates, innovative fuel efficiency, etc.), which will lead to industrial structural reforms, including new international alliances, the active participation of players from other industries, and integrated efforts based on operations and infrastructure.

(DX)

- Aircraft development is extremely complex, with approximately 3 million parts (about 100 times the number of parts in an automobile) and strict safety requirements, so rework in development puts pressure on schedules and costs.
- Under these circumstances, DX in aircraft development will progress, including the use of digital technologies such as MBSE (Model- Based Systems Engineering), which evaluates and analyzes the entire product on a system before product design, and conducts appropriate overall design at the upstream stage of development.

＜Changes in Japan's Business Structure＞

- Japan, which has grown as a Tier 1 supplier mainly in the development of twin-aisle aircraft by overseas airframe manufacturers, will also enter the growing single-aisle aircraft market. Specifically, in the airframe business, the Japanese industry will participate in the development of single aisle aircraft with new environmental technologies by participating in or leading the integration of subsystems and businesses, thereby capturing the growing single aisle aircraft market. In addition, we will promote the application of new environmental technologies for decarbonization to next-generation aircraft.
- In the engine business, the Japanese industry will collaborate with overseas OEMs from upstream processes such as conceptual design to establish leadership in the overall program by leveraging advanced technology development such as ultra-efficient propulsion systems and hybrid electric propulsion systems, manufacturing efficiency improvement, and the strengthening of the domestic supply chain.
- With regard to the aircraft supply chain, we will strategically build up the supply chain in Japan, where Japan has an advantage and plays an important role in the supply of aircraft. In the Asia-Pacific region, including the countries of the Global South, the Japanese industry will not merely extend its existing businesses, but will also establish local operations and joint ventures (JVs) to build international supply chains and capture growth opportunities in overseas markets.
- Engage other industries triggered by emerging markets such as Advanced Air Mobility (AAM), and promote the entry of new startups with innovative technologies such as Additive Manufacturing.

- New testing facilities required for the introduction of new environmental technologies will be organized into two categories: those to be developed cooperatively by related parties and those to be developed individually by each company, and rational capital investment will be made throughout the country.

(6) Space Industry

Key Points

- The rapid increase in the number and performance of launch vehicles and spacecraft caused by technological innovation and the low cost of rockets and satellites due to mass production will democratize services such as communications, earth observation, and positioning from space and spread to industrial society.
- DX in the mobility industry, civil engineering, construction, infrastructure industry, agriculture, forestry, fisheries, marine industry, etc., as well as promotion of GX through environmental monitoring from space, and security use of space as a strategic high ground will be further developed.
- As of 2040, the international market will have grown by about three times, from about 56 trillion yen at present to about 150 trillion yen. The Japanese government has also set a goal to expand the market size of the domestic space industry from 4 trillion yen in 2020 to 8 trillion yen in the early 2030s.

＜Changes in the overall global demand structure＞

- The expansion of satellite communication services and other services has increased private demand for satellites and space transportation (rockets), while public demand has also increased due to growing security needs. The public sector is also increasingly seeking to procure services from the private sector, in addition to self-development.
- Demand is growing rapidly, especially in the context of DX and GX for private demand, and economic security (and security) for public demand, respectively.
  - DX: Low-cost, high-performance satellites (communications, earth observation, positioning) will facilitate DX in other industries (e.g., high-frequency mapping, Beyond 5G/6G communications, automated driving, infrastructure monitoring, oceanographic situational awareness, etc.). In addition, the development of non-terrestrial networks (NTNs) that connect space, stratospheric platforms, flying cars, drones, ground systems, marine systems, etc. in a multi-layered manner will create new demand for communications.
  - GX: Monitoring of GHG emissions such as CO2 and methane from earth observation satellites will become more sophisticated and more frequent, and monitoring of GHG emissions from mobility, factories, plants, etc. and various environmental businesses will progress. The space sector will be included in the SDGs investment targets.
  - Economic Security: In the security field, in addition to the existing information gathering and positioning services of other countries using advanced satellites, space utilization in the security field will further develop, including detection and tracking of hypersonic missiles, real-time monitoring of maritime conditions of ships and other vessels, and provision of high-speed, high-capacity optical communication infrastructure. In addition, space infrastructure will be widely used by various industries and organizations as an important new economic and social infrastructure. From this perspective, it is expected that countries and regions will tend to promote domestic production of space assets and cooperation and sharing among allies.

＜Changes in the overall global supply structure＞

- Since the 2000s, the military-civilian dual-use space business, represented by SpaceX and other private companies, has emerged. The transition from "public" to "private" initiative has been in full swing, especially in recent years, as cutting-edge technologies have been created by the private sector rather than the public sector. Technological innovations such as reusable rockets and small satellite constellations have expanded access to and use of space. Space services that require large investments are now being provided as private businesses.
- Space ventures further increase worldwide. In addition, space companies and non-space companies (automotive, telecommunications, electronics, semiconductors, AI, energy, finance, etc.) will collaborate, engage in M&A, and exchange technologies. By 2040, the difference in competitiveness among these players is expected to become more pronounced.
- Beyond this, launch vehicle companies, satellite constellation companies (communications, observation, etc.), satellite operations and geospatial data platform companies, on-orbit service companies, space situational awareness (SDA) companies, key component manufacturers, etc., which will capture the global market, and their vertical integration and horizontal integration with other industries, platforms are expected to emerge.
- Since space is an important technology and business in terms of security, it is expected that the government will continue to support to a certain extent to develop the technology and business in their own country and region, even if their competitiveness is inferior to that of other countries. However, due to pressure from users who demand inexpensive, high-quality services, the number of companies which will not be able to survive even with government support will increase, and as a result, some countries may lose their independence in space activities. If Japan loses independence in space activities, it will become dependent on foreign countries for infrastructure essential to our nation's security, economy, and society, which will not only pose a security risk but also create a new trade deficit as well as a digital deficit.

＜Changes in Japan's Business Structure＞

- Japanese space companies will be exposed to more intense international competition in the future, and only those companies with the will, technology, and business model to survive the competition will survive the competition.
- Only such companies will be able to enter a virtuous cycle of further technological innovation by obtaining investment funds through procurement of services from domestic and foreign security users, government agencies, private companies, etc.

(7) Forging and Refining industry

Key Points

- The integration of new technologies and the reorganization of new materials will accelerate and the competitiveness of individual companies will increase, and efforts to capture growing global demand, including that of non-Japanese OEMs, will accelerate by promoting investment in GX and DX.

＜Changes in the overall global demand structure＞

- In the future, as demand for automotive, industrial machinery/robots, etc. expands, and as the trend toward high value-added products continues, the need for a wide variety of materials and shapes to support these products will increase.
- While products will be required to be green, non-green demand will also remain.
- Demand for green materials and shapes will increase due to regulations, especially in developed countries, in response to the CN movement. The demand for zero CO2 emissions, especially for automotive applications in Europe, will change the very value of forgings, which is to be manufactured and supplied with precision, quickly, and cheaply.
- Demand exists for non-green bare metal products, especially for products for domestic demand in some developed countries and developing countries. Demand for domestic manufacturing will increase in sectors where domestic manufacturing has a competitive edge, such as industrial machinery and robots, and for metal components that are important from an economic security perspective.

＜Changes in the overall global supply structure＞

- Companies will base their business activities on two axes: ①high value-added products/commodities and ②green/non-green.
- The supply system for high value-added products will shift from highly functional parts by precision machining, etc., and single-processed parts to multiple-processed parts, modules combining parts, etc., with the added value of green. Companies that secure these supply capabilities will gain an advantage.
- European companies will supply green metal parts backed by abundant renewable energy.
- General-purpose products will become commoditized and green value-added will only be effective to a limited extent.
- The supply of non-green products will be a cost competition to compete in terms of supply volume from the perspective of rational corporate behavior. Therefore, the main focus will be to produce within developed countries for domestic industrial demand, and to meet demand in developing countries through local production. As the supply system of local firms becomes more organized and competition intensifies, there will be a greater demand for high value-added products and improved productivity.

＜Changes in Japan's business structure＞

(Japan's business structure)

- More companies will be making sustained investments in automation and other growth to address labor shortages and other challenges.
- Around 2040, Japanese companies will be required to have the ability to propose value propositions required for end products and the innovative component performance to realize them in the fields of aerospace and energy, in addition to the automotive field such as EVs and e-fuel vehicles, and companies that realize them will gain added value. In this context, incorporation of new manufacturing technologies such as metal 3D printers and digitization of craftsmen's know-how, which is one of the current strengths of the industry, will be important to ensure competitiveness.
- Since green will be a prerequisite for market entry around 2040, both domestically and internationally, establish a supply system to add green added value to high value-added products. For example, in addition to electrification and zero-emission fuels for industrial furnaces, the entire supply chain will be optimally managed for production, and at the same time, the necessary DX will be implemented to grasp CO2 emissions data, etc.
- From the perspective of economic security, an information management system and further productivity improvement will be required in precision casting, which determines the quality of critical parts, and in molds, which not only determine quality aspects but can also be considered design information. In this context, corporate integration and collaboration based on supply chain optimization will also advance.
- In order to capture demand for automobile manufacturing, etc., overseas, in conjunction with the supply system of Japanese OEMs, there will be an increase in the number of cases where local production overseas will be promoted along with domestic production for products to be exported and further developed into the supply of parts to overseas OEMs.

(Constraints to supply green products)

- Japan is characterized by the constraining factors of a stable and inexpensive supply of clean energy and a shortage of labor.
- Therefore, when a company builds a new factory, an important factor to consider is whether the area has a relatively large supply of stable and inexpensive clean energy.
- In addition, the shortage of labor will make it imperative to improve the efficiency of the manufacturing process of bare-metal products through DX, so there will be an even greater need for personnel to advance DX than in the past.
- Until around 2040, green elementary shaped products will be manufactured by utilizing limited, stable, and inexpensive clean energy in Japan through DX and mass balance methods.

(8) Chemical industry

Key Points

- By consolidating naphtha cracking reactors located in the complex, we will optimize the utilization ratio and make our financial situation more muscular, thereby laying the groundwork to lead the international competition.
- In parallel with the restructuring of naphtha crackers, the company will stably produce and supply ethylene, propylene, and other basic chemicals needed to meet domestic demand, while also keeping an eye on international decarbonization trends and capturing external demand with high value-added functional chemicals to increase international competitiveness.
- In the wake of China's export restrictions and the earthquake in Japan, continuous and stable supply of materials is no longer a matter of course, but a value-added area. The entire supply chain needs to recognize this idea and adopt a business style that pays the necessary price.

＜Changes in the overall global demand structure＞

- Demand for functional chemicals, especially in the automotive, semiconductor, battery, and other fields, will increase for the functional chemicals that will be used as part materials for these products. In particular, the demand for green functional chemicals will increase due to regulations, especially in the EU, as the global decarbonization efforts progress and the demand for zero CO2 emissions, especially for automobiles in Europe, will increase. to support demand for green chemicals.
- On the other hand, non-green demand will remain for basic chemicals utilized in relatively inexpensive commodities, both in developed and developing countries.

＜Changes in the overall global supply structure＞

- Companies will base their business activities on two axes: ①high value-added functional and commodity basic chemicals, and ②green and non-green products.
- Because global decarbonization efforts will lead to a competitive advantage for companies that have secured the ability to supply high value-added and green chemical products, companies will shift to a system of manufacturing and supplying green chemical products, focusing on products that are high value-added in terms of functionality. In particular, green added value will be added through fuel conversion and raw material conversion in the manufacture of high value-added products for automobiles, semiconductors, batteries, and other parts and materials.
- DX advances in R&D and manufacturing processes. materials informatics, which utilizes AI and other technologies to develop chemicals, will advance, dramatically improving R&D efficiency. During manufacturing, processes will be optimized and CO2 emissions will be managed efficiently according to end-use demand.
- Companies will be located within their home countries, where their headquarters functions are located, with a focus on functional chemicals with technological advantages from the perspective of economic security.

＜Changes in Japan's business structure＞

- In anticipation of future decarbonization, the company will consolidate its naphtha cracking furnaces, a major source of chemical products, and optimize its operating rate to make its financial situation more muscular.
- Domestic production and supply of basic chemicals such as ethylene will be optimized to the volume required to meet domestic demand.
- In addition, given the situation in China, where a large-scale ethylene production facility with a capacity of over 1 million tons is being newly built and operated, exports of basic chemicals will become an area of cost competitiveness. Therefore, we will earn foreign currency through engineering and licensing for local production rather than exports, mainly to developing countries in Asia, both green and non-green.
- For high value-added functional chemicals, the company will shift to a production and supply system that will decarbonize the industry, while also keeping an eye on international decarbonization trends, and will continue to capture external demand in areas such as semiconductor part materials, where it has a high global market share. Specifically, the Company will decarbonize basic chemicals and add green value to functional chemicals by switching from coal to gas and, in the future, hydrogen and ammonia as fuels for in-house power generation, as well as from naphtha to bioethanol and waste plastics as feedstock. This will also help reduce resource constraints on imported naphtha.
- In the wake of China's export restrictions and the earthquake in Japan, the continuous and stable supply of materials is no longer a matter of course, but a value-added area. The entire supply chain, including basic chemicals manufacturers, derivatives manufacturers, and downstream automotive and semiconductor manufacturers, will recognize this idea and build a business style that promotes coexistence and co-prosperity by paying the price necessary for a stable supply.
- Regarding the location of plants for basic chemicals, we will utilize crackers in our own country to meet domestic demand, and local production to meet demand mainly in Asia.
- For functional chemicals, in addition to basic chemical manufacturers and derivatives manufacturers, it is necessary to coordinate with downstream manufacturers such as automobile and semiconductor manufacturers and decarbonize the industry. In addition, it is necessary to take careful measures to prevent technology outflows, and the location of plants and production will be carried out with these considerations in mind.

(Constraints to supply green products)

- One of the characteristics of Japan is the limited supply of stable and inexpensive clean energy, as well as raw materials and manpower.
- Therefore, when companies build new plants for decarbonization, they take into account the amount of bio-feedstock and waste plastics as well as the location of hydrogen, ammonia, and other bases.
- In addition, materials informatics using AI and other technologies will progress, as the shortage of manpower will make it essential to improve the efficiency of R&D processes for functional chemicals using DX.

(9) Steel Industry

Key Points

- Developing business with global markets.
- Maintaining green supply capacity that responds accurately and flexibly to the mosaic of progress in greening both domestically and internationally.
- Maintaining development and production functions that produce cutting-edge technologies, even if the domestic production system is reduced in quantity.

＜Changes in the overall global demand structure＞

- 【Quantity】Domestic steel demand will shrink to a certain degree overall as a result of a decline in demand for building materials and other purely domestic products due to a shrinking population, and as user companies move further toward local production overseas, domestic demand, which is demand for export products of these companies, will also decline. On the other hand, overseas demand, including general-purpose and high-end products, will increase in line with global population growth and economic growth, and thus total global steel demand will expand.
- 【Quality】Global demand will not only expand for general-purpose products, but also for high-value-added steel products such as high-tensile strength steel and non-oriented electrical steel sheets for electric vehicles, thick plates and tubes for energy infrastructure, and grain-oriented electrical steel sheets to support these efforts as GX and DX move forward worldwide, not only in developed countries but also globally.
- 【New Value】In response to the global trend toward carbon neutrality, there is already a growing demand for green steel products, as seen, for example, in some automobiles for Europe and in the efforts of companies such as GAFA that aim to use green materials. In the future, demand for green steel products will gradually increase due to regulatory and institutional measures mainly in developed countries. On the other hand, since different countries have different reduction targets and other policies and business progress, and demand for non-green steel products will remain for a considerable period of time, the market will undergo a decoupling between green and non-green products.
- 【Creating new demand】In the GX and DX movements, demand will also continue to grow and be created, especially for high-end products, as high-functional materials that provide solutions, for example, heat-treatment-free steel and steel that is resistant to hydrogen embrittlement.

＜Changes in the overall global supply structure＞

- 【Competitive Environment】In China, huge supply capacity will be maintained even if some progress is made in dealing with excess production capacity. Other countries, such as India, will also increase their supply capacity, including the construction of new blast furnaces, in line with economic growth. The steel industries in Europe and the U.S. are taking policy measures to control the inflow of steel products from outside the region under their own policy objectives, such as security and environmental protection. While the latest equipment is being introduced in China, India, and other emerging economies, Japan, the U.S., and Europe will steadily renew aging facilities, and efforts to strengthen competitiveness, including local production for local consumption, will progress.

- 【Technological Competitiveness】As economies mature, the steel industries in each country are expected to improve their production technologies not only for commodity products but also for high value-added products to a certain extent, and the gap in technological competitiveness with Japanese companies will narrow to a certain extent.
- 【Green Technologies】In developed countries and other countries where the market is becoming greener, a steel production system with lower carbon emissions will be established. However, it is difficult to meet steel demand with steel scrap alone due to volume constraints, and decarbonization of the steel reduction process, such as hydrogen reduction steelmaking, is necessary. Therefore, research and development of low-carbon reduction processes, such as hydrogen reduction ironmaking, and social implementation efforts will be promoted. In this context, the ability to produce green and high value-added products will become important in terms of competition.
- 【Business Model】The green process transformation will shift from the traditional structure in which competitiveness was greatly affected by differences in the ability to ensure high productivity using relatively inexpensive and highly stable supplies of coal and iron ore, to one in which competitiveness is not only limited to the technological competitiveness of green production processes, but also to the ability to produce green and low-carbon power sources, hydrogen and other energy sources, and to produce high value-added products, The composition of the business will change to one in which competitiveness depends not only on the technological competitiveness of green production processes, but also on the economic availability of decarbonized and low-carbon power sources, hydrogen, CCS, high-quality iron ore and scrap, and other resources. The use of DX, including data linkage for traceability management in R&D, production, and supply of green products, will also be key. The steel industry will be asked whether it can transform itself from a simple processing and production business to a comprehensive business that includes the production of raw materials and energy itself.

＜Changes in Japan's business structure＞

- As noted in each mission, Japan's business environment includes issues such as the uncertainty of future green demand and constraints on the supply of stable, low-cost clean energy in Japan. If key aspects of these issues are resolved, such as the creation of continuous and predictable demand for products with high environmental value through public and private sector initiatives, including policy responses, the following changes in business structure are expected to occur.
- In addition to the changes on the domestic and international demand side, Japanese companies will restructure their supply systems both domestically and internationally, taking into account the trends of competitors, the state of their own production capacity, and the competitiveness of their locations.
- 【Green Strategies】While maintaining and strengthening competitiveness for the non-green market, which accounts for a considerable volume of the market, we will develop and strengthen the supply system for the green market in line with the speed of progress in greening the market in Japan and overseas. Specifically, in tandem with the greening of the market, the conversion of existing processes to green production processes will be promoted (on a large scale, first of all, the conversion from blast furnace processes to innovative electric furnaces will be promoted). In

addition to innovative electric furnaces, there are other technological options such as ironmaking processes utilizing hydrogen (hydrogen reduction blast furnaces and direct hydrogen reduction) and the use of CCUS/carbon recycling, and while developing these options, the appropriate option will be selected based on the state of technological development and economic feasibility at the time of conversion. In this case, the option of utilizing reduced iron produced in countries with abundant renewable energy sources in domestic electric furnaces is also an option.

- 【Location Strategies】
  - With regard to the domestic supply system, while it is inevitable that domestic production will shrink to a certain extent due to the decline in net domestic demand, it is necessary to establish an R&D center and an integrated steel production system, including upstream and downstream processes, on a certain scale in order to maintain the ability to produce high value-added products and green products as a company. The domestic supply system will maintain a certain level of volume, as the basis for this is the establishment of an integrated steel production system in Japan on a certain scale, including research and development facilities and an integrated production system from upstream to downstream processes. This will make it possible to supply high value-added products domestically and internationally while preventing technological outflow.
  - The supply system outside of Japan has so far focused on supplying Japanese-affiliated user companies with products made from base materials, etc. exported from Japan in local processes, in line with their overseas local production activities. However, in emerging countries and other regions, demand for steel is growing along with economic growth, and a system will be established to meet local demand by acquiring local production capacity, including blast furnaces and other upstream processes, while also utilizing M&A.
- 【Returning Profits】In local production, the production of high value-added products utilizing technologies developed in Japan will be promoted while paying sufficient attention to the outflow of technology. In addition, by utilizing green production process technologies developed in Japan, local production processes can be converted to meet the demand for green products in line with the progress of greening overseas markets. A portion of the profits from these overseas production activities will be returned to Japan and used to upgrade the domestic supply system.

(10) Medical Devices

Key Points

- The key to gaining market share in the global market is whether we can compete with SaMD (Software as a Medical Device) that combine Japan's strengths in diagnostic equipment with digital technology, and whether we can commercialize devices that solve unmet medical needs.
- In general terms, as profitability in the domestic market declines due to downward pressure on medical fees, overseas expansion is necessary to strengthen industrial strength, and U.S. expansion is essential to ensure competitiveness in the world. If competitiveness is to be enhanced only in the domestic market, it must be in the form of securing a stable supply through support under the title of economic security.

＜Changes in the overall global demand structure＞

- The market size of the medical device industry will expand with the aging of the population in developed countries, the increase in medical needs associated with population growth and economic development in emerging and developing countries, and technological innovation. In addition, it will be necessary to address the shortage of medical personnel.
- The developed markets (especially the U.S.) are expected to continue to grow as a destination for innovative products. Emerging and developing country markets are also expected to grow significantly, as the shift in the structure of diseases in the Global South (Asia and Africa) from infectious diseases to lifestyle-related diseases will expand the scope of entry.
- Meanwhile, in addition to therapeutic devices, new growth areas will include SaMD, which directly effect the treatment, diagnosis, and prevention of diseases, and robotic surgery, which integrate digital technology and medical devices.

＜Changes in the overall global supply structure＞

- Research and development of medical devices must be conducted on a long-term and large-scale basis, as it generally takes 5 to 10 years or more from the identification of needs and concept establishment to the launch of a product. In addition, in order for a new medical device to be accepted and spread in the market, it is essential not only to obtain regulatory approval, but also to go through a "nurture" process in which the device is demonstrated to have a significant impact on medical needs through clinical trials, etc., and with that evidence, to be used in many medical settings.
- Since the structure of the industry cannot compete globally unless it is a business entity that can withstand such high-risk large-scale investment in R&D and clinical trials, a horizontal division of labor is established in which startups are responsible for research and development and medical device manufacturers are responsible for manufacturing and sales. Under such circumstances, it has become common for innovative products developed by startups to be put to practical use in collaboration with medical device manufacturers, and the formation of an ecosystem in which startups raise funds on a large scale from VCs, and the expansion of the corporate scale of medical device manufacturers through restructuring and integration and M&A of overseas companies.
- The successive creation of new modalities such as AI diagnostics and other SaMDs will lead to the widespread use of products that are effective for unmet medical needs and solve medical and social problems such as overworked medical personnel and increased medical costs.

＜Changes in Japan's business structure＞

- The domestic market will continue to have a certain presence because it is one of the limited markets that can handle advanced medical devices, including IT-based products, and because it is a market with high medical standards and where evidence can be obtained to enhance the value of medical devices, etc. On the other hand, due to downward pressure on medical service fees resulting from the sustainability of social security finances, it will be difficult to pass on prices, and profitability will continue to be lower than in overseas markets. Even in such a situation, the industry will grow to be one of the world's top internationally competitive industries, as a mechanism to evaluate innovative products is being considered.
- SaMD, such as AI diagnostics, and products that approach unmet medical needs developed by start-ups will increase their market share both domestically and internationally, and start-ups will be positioned as an indispensable driving force in the medical device industry as a player that brings new value to healthcare.
- In addition to the environment of high medical standards and manufacturing technologies, the domestic location environment will maintain the potential to produce medical devices that can be used in overseas markets by improving the data acquisition and utilization environment and supporting R&D in areas where Japan has international competitiveness (diagnostic devices, SaMD, etc.). In addition, eliminate concerns about supply risk in the supply of parts and materials, and demonstrate high competitiveness in the supply of parts and materials, backed by high technological capabilities.
- A virtuous cycle will be established in which the R&D environment is improved to capture the global market, and more medical device manufacturers will expand their business overseas, especially in the U.S. The industry will grow into a world-class, internationally competitive industry, contributing to the supply of medical devices, including innovative products, to the global market. As a result, both securing a stable supply of medical devices in Japan and reducing the trade deficit will be achieved.

(11) Pharmaceutical Products

Key Points

- Global development is the basis for pharmaceutical products. For more effective and efficient global development, it is important to aim for approval by the U.S. FDA and other regulatory authorities from the early development stage.
- Pharmaceutical Startups that place the highest priority on bringing drugs to market should position M&A from major pharmaceutical companies as their ultimate goal, rather than IPO, which is merely a means to raise funds.
- CDMO, a new modality, has ample potential to grow in Japan. Especially in the areas of regenerative cell and gene therapy, it is a winning opportunity.

＜Changes in the overall global demand structure＞

- Global population growth, aging, and economic development will increase demand for commodities, especially in developing and emerging countries, and for new drugs to satisfy unmet medical needs, especially in developed countries. Most of the growth in the pharmaceutical market will be generated by new drugs with high unit prices.
- In particular, the market size will expand significantly for new drugs that utilize biotechnology (biopharmaceuticals), such as nucleic acid drugs and next-generation antibody drugs. In addition, it is expected that personalized medicine, which is highly effective and has few side effects, and regenerative cell and gene therapy, which can lead to fundamental treatments, will also become popular worldwide (mainly in the U.S.).

＜Changes in the overall global supply structure＞

- Competition in the development of biopharmaceuticals is accelerating in disease areas that could not be targeted by small molecule drugs. Even if it is collectively called biopharmaceuticals, the basic technologies used for each modality (antibodies, nucleic acids, cells, etc.) are completely different, so various manufacturing technologies and know-how are required that are different from chemical synthesis, and the development and manufacturing costs are very high compared to conventional small molecule drugs. For this reason, universities and startups search for seeds, and CMOs (Contract Manufacturing Organizations) and CDMOs (Contract Development and Manufacturing Organizations) develop and manufacture them on a contract basis. An ecosystem of horizontal division of labor has been formed in which pharmaceutical companies invest in the entire value chain of investment in seeds, R&D management, and sales of new drugs. With the further expansion of the biopharmaceutical market, this trend will continue to intensify. (Some cutting-edge technologies are moving to in-house manufacturing, so the vertically integrated model is not going away.)
- In addition, advances in digital technology and increased computing power will lead to a discontinuous increase in the efficiency of exploratory research. Improvements in simulation accuracy will contribute to the creation of new small molecule drugs, and improvements in the accuracy of data accumulation and analysis of functions linked to genomes will promote the creation of new biopharmaceuticals.

- Universities and Startups: Academia produces innovative research results based on the free ideas of researchers. When publishing papers or making intellectual property, the possibility of practical application is examined together with VCs and entrepreneurs, and when commercialization is targeted, it is done under an appropriate strategy. Once the startup is established, the basic strategy is to maximize the value of the development pipeline through global development and M&A exits by major pharmaceutical companies.
- CMO/CDMO: Demand is increasing, especially for biopharmaceuticals. Since it is necessary to manufacture investigational drugs from the non-clinical trial stage, the technology development component will become more important than simple contract manufacturing.
- Pharmaceutical companies: In order to actively acquire Pharmaceutical Startups, Business Development (BD) departments are located in the neighborhoods where universities and drug discovery ventures are located. In order to avoid being outbid by the competition, the BD department will begin investing in the venture at an earlier stage.

- In addition, as seen in the case of the vaccine and therapeutics for the new coronary disease, securing the supply of medicines is extremely important from the perspective of economic security and medical security. Cooperation with like-minded countries is also important.
- The biopharmaceutical manufacturing process requires highly skilled human resources. For this reason, companies will locate in regions where internationally competitive human resources (quality and labor cost) are increasingly concentrated. In addition, since the superiority of the location of a center depends on its proximity to universities and startups, it is also important to have a certain degree of concentration of Pharmaceutical Startups.

＜Changes in Japan's business structure＞

- The domestic market must continue to be less profitable than overseas markets (especially the U.S.) due to the pressure to lower drug prices from the perspective of ensuring the public's access to medicines and controlling social insurance premiums. On the other hand, from the perspective of economic security and medical security, the domestic manufacturing base will be strengthened and cooperation with volunteer countries will be established. In addition, the evaluation method according to the value of innovative drugs will be studied further.
- Pharmaceutical Startups have accumulated a certain amount of companies that are aware of launching drugs not only in Japan but also in the U.S. market as an exit. CMOs and CDMOs are increasingly located in Japan due to the concentration of internationally competitive human resources (quality and labor costs). In Japan, pharmaceutical companies will also actively Pharmaceutical Startups acquire by increasing and renewing the workforce in their business development (BD) departments and forming teams that can handle biopharmaceuticals.
- In fields such as medicine, pharmaceuticals, and biology at Japanese universities, the appointment of doctoral personnel by industry will also increase, and an educational system based on doctoral degrees will become widespread.
- As a result, a world-class drug discovery ecosystem will be formed in Japan, contributing to the creation of innovative new drugs as part of the global drug discovery ecosystem. It will also promote the location of manufacturing facilities and strengthen export capabilities, contributing to a stable supply of pharmaceuticals.

(12) Healthcare Services

Key Points
・ With PHR at the core, various products and services related to food, clothing, and housing will become high value-added with health as the starting point.

＜Change in demand structure＞

- The needs for health promotion are too varied to be summarized in a single category because they depend on individual lifestyles and are latent at present. The aging of the population and the use of technology are leading the world.
- Specifically, many elderly people are concerned about their own and their spouses' health, and their health needs are already beginning to emerge. In addition, under life planning based on longer life expectancy, the working-age population will also begin to invest in their health from a young age to prepare for the future. In addition, if desired, staying healthy will be of great value to continue working (and being employed by companies) even after retirement.
- In addition, health outcomes will be visualized through life logs obtained by wearable and IoT devices, and people will be able to understand their own health status and health promotion efforts in real time and in detail.
- Companies will also invest in employee health as a human capital investment to improve employee labor productivity and engagement. They will address women's specific health issues and create an environment where women can work longer and healthier.
- In this context, all kinds of products and services related to daily life, including clothing, food, and housing from supplements and health foods to fitness, esthetics and relaxation, functional bedding and health-oriented home appliances, and health tourism, will be replaced by health-oriented products and services and become highly value-added. As a result, a new lifestyle will be created in which health promotion is a part of living expenses (fixed costs) such as food and utilities.
- In addition, as human capital becomes a source of competitiveness, employee health will become an important investment for companies, which will promote investment in health by third parties and society as a whole and will contribute to improved health literacy and increased consumption by individuals in the future.

＜Change in business supply structure＞

- Services will be personalized based on lifelog data acquired by wearable and IoT devices. In addition, the standardization of data will make the acquired PHR available to medical institutions and various lifestyle-related industry businesses that have many points of contact with consumers. In addition, the use of IT and AI will make it possible to provide a variety of services without being bound by time and space.
- For example, SaMD will enable people to receive treatment that fits their own lifestyle, efficient service provision such as telemedicine and AI diagnosis will become possible, foods and menus to be incorporated based on health data and other information will be suggested when shopping at supermarkets, and at fitness clubs, At fitness clubs, training menus optimized for each individual based on the amount of daily exercise and physical reactions during exercise will be proposed.

- Through the provision of such services, further accumulation and utilization of data will promote the building of evidence and further individualization, leading to a virtuous cycle of development and provision of better products and services.
- In this context, all kinds of products and services, including clothing, food, and housing, will become value-added with health as the starting point, and will also play a role in Japan's social security system (improving the health of the nation).

(13) Nursing care Services

Key Points
・ Under the constraints of public insurance financing, compensation will be improved by increasing productivity through higher added value and efficiency, while also making effective use of the private-sector market.

＜Changes on the demand side＞

- Demand for nursing care will increase significantly with the aging of the elderly, as the percentage of the population aged 85※ or older increases from 4.9% in 2020 to 8.9% in 2040.
  ※ The percentage of people aged 85-89 who need long-term care is 48.1% (2022 edition of the White Paper on Health, Labor, and Welfare), an age at which the percentage of people certified as needing long-term care is about 50%.
- On the other hand, the co-payment ratio and coverage of public nursing care insurance will be reviewed to a certain extent from the perspective of fairness of social security, the burden of insurance premiums, and financial sustainability (for example, the co-payment increase for those above a certain income level, daily living assistance for those who require light nursing care (nursing care 1 and 2) (For example, the following issues have already been discussed: increasing co-payments for those above a certain income level, and the nature of benefits related to daily living assistance services for those who require light care (nursing care 1 and 2).
- In addition, the disconnects in terms of cost (10% to 30% of the cost is co-paid depending on income if insured, and the full cost is co-paid if uninsured) and information (access to services) under the current system, etc. will be resolved so that services inside and outside the public insurance system can be used in combination in pursuit of better living against a background of diverse lifestyles and health needs, and an optimal social system will be established.
- Under these circumstances, it will become common to use not only the services available within the public insurance, but also a combination of services outside the public insurance depending on the quality and quantity of services desired.
- For example, moving into high-end facilities with luxurious exteriors and interiors, high-quality meals, etc., mainly for the wealthy, or using home-visit care and lifestyle support services (number of visits, appointment of helpers, types of services provided, etc.) that exceed the coverage of public insurance, even for non-wealthy people, The use of services that promote social participation and prevent nursing care, such as fitness and commuting places, will expand.
- Furthermore, for companies, the loss of labor productivity due to difficulties in balancing work and caregiving with the increase in the number of business caregivers and the separation of employees from caregiving are serious issues for management. Therefore, in a way that management is committed, the actual situation should be understood, and responses such as cooperation with human resource strategies that accompany the situation, and information. Therefore, companies that support their employees in balancing work and nursing care will increase in number, as management makes a commitment to understand the actual situation, to respond by linking human resource strategies accordingly, and to disseminate information, etc.

＜Changes in the Business Supply Structure＞

- In the natural state, there will be a shortage of nursing care workers of about 700,000 by 2040, due to a structural shortage of labor caused by a declining population and an increase in demand for nursing care.
- Therefore, using ICT, introduction of nursing care robots, task shifting/sharing, reskilling, and other initiatives, productivity will be thoroughly improved, and a diverse range of caregivers (foreigners, elderly, etc.) will be able to participate.
- In addition, diverse entities, not limited to nursing care providers, will participate in nursing care-related businesses, and mutually cooperate with local communities to meet the demand for care for the elderly with total supply capacity, including services not covered by public insurance.
- For example, private businesses will provide a variety of services, such as housekeeping and fitness services tailored to the needs of the elderly, as well as uninsured home care services that can respond to the number of visits and unexpected needs that exceed the coverage of public insurance. In addition, using PHRs and other tools, optimal service content based on detailed individual needs and the combination of multiple services can be realized. This will also increase the added value of services and help to raise wages for workers.
- In addition, the community and the private businesses will work together to build a system to support the lives of the elderly, for example, by providing town-wide monitoring services in cooperation with stores that the elderly regularly visit and the Community Comprehensive Support Center, by providing day services and gathering places at supermarkets, and by consolidating mobility support services at hubs such as the one in the supermarket. The system to support the lives of the elderly will be built by the local community and private businesses working together. In this case, not only municipalities but also prefectures will be involved, and a system will be established in each region to promote cooperation between the community and private operators.
- In parallel with the broadening of the base of providers, the channels for delivering uninsured services of nursing care insurance to the elderly will be strengthened and their reliability will be ensured. For example, incentives will be set up for local welfare professionals to introduce uninsured services, and a window function will be enhanced to arrange comprehensive care-related services, including uninsured services, in their work areas. In addition, the establishment of a certification system led by private organizations will ensure safe and secure services and further improve the environment for the utilization of uninsured services.

(14) Logistics and distribution (wholesale and retail)

Key Points

- On the demand side, more detailed and extensive responses will be required as consumer needs diversify. On the supply side, as a labor-intensive industry, it will face a labor shortage due to the low birthrate and aging population.
- To cope with these situations, it is difficult to realize the conventional approach of relying on inexpensive and flexible on-site labor and response capabilities.
- In both the distribution and logistics domains, the situation is already undergoing a "shift to an equipment industry," with some companies leading the way. Vertical integration from manufacturing to retailing, horizontal collaboration among companies in cooperative areas, and integration of online and offline operations through DX will increase productivity in the industry. On top of that, by raising wage levels, the industry will become a familiar and high-quality place of employment for the people.

＜Changes on the demand side＞

- Logistics is related to all industries, both manufacturing and non-manufacturing, and is an essential industry for the domestic economy and daily life. The problem of transportation capacity shortage is a limiting requirement for our economy.
- Demand for transportation is expected to grow as GX, DX, economic security, and other factors drive domestic investment and a return to the domestic market.
- Demand for goods in Japan is not expected to expand quantitatively due to population decline but will require a detailed response to meet the individual needs of consumers. Japanese consumers will continue to demand perishable goods, but their reliance on digital platforms will increase, and the rate of online purchases will reach the level of other countries in Europe, the U.S., and China over time. The demand for last mile services for consumers will continue to increase, and more efficiency will be required.
- Although the population is increasingly concentrated in urban areas, a certain number of people continue to live in rural and mountainous areas, making full use of digital technology, and the issue of maintaining the supply function of distribution and logistics to deliver daily necessities and other goods to areas where demand is sparse is now in full swing. Similarly, the number of elderly households living alone will increase in urban areas, and the number of people with access difficulties (shopping refugees) will also increase.
- Interest in sustainable consumption (ethical consumption) is also growing, and products and services related to environmental friendliness, ethical products, and health promotion will also be in demand.

＜Changes in Business Supply Structure＞

- Currently, the industry structure unique to Japan is characterized by a dispersed market, many companies of all sizes, thin margins due to excessive competition and high SG&A costs, and a lack of resources to make sufficient investments. The tendency to move toward price-competitive businesses is widespread, and both wages and productivity are stagnant.

- In an age of labor shortages, the industry will face a crisis of not being able to meet demand as it lags the competition for human resources and its supply function shrinks significantly against the backdrop of low birthrate and aging population. However, the functions of distribution and logistics are essential to society, and productivity will increase all at once as companies strategically shift to becoming equipment industries. Wage levels will also rise in relative terms.
- In the face of extreme supply constraints, rationalization and efficiency will be thoroughly promoted to maintain functions. Movements toward vertical integration, which includes everything from distribution to manufacturing and logistics domains, and horizontal collaboration that transcends corporate and industry barriers in the cooperative domain are also gaining momentum. The individual optimization of many companies that existed in the past will be eliminated, and standardization of both hardware and software will advance, further accelerating the trend toward integration and collaboration.
- In logistics, the implementation of the Physical Internet will lead to the transformation of logistics into an equipment industry through the streamlining of logistics platforms such as cargo seeking and vehicle matching and warehouse management, as well as the automation and mechanization of warehouse operations and other processes. Shipper operators will promote management centered on supply chain management, including logistics, based on the use of such technologies and enhanced collaboration within and outside the company.
- In retail, customers will experience a more seamless shopping experience on a daily basis through omni-channeling, in which online and offline operations are integrated to provide sophisticated services. Real stores will be thoroughly automated and cashless, the number of personnel needed to operate stores will be greatly reduced, and the number of unmanned stores will increase. On the other hand, real stores will be redefined in terms of their multiple functions and values to meet the needs of local communities and consumers, such as being more than just a place to display products. The significance of these centers will be redefined in the form of multiple functions and values in response to regional and consumer needs.
- In particular, in regions with declining populations, various models will spread, including public-private partnerships to operate stores integrated with public facilities (municipal government buildings, bus stops, etc.) from the perspective of aiming for greater efficiency in attracting customers. For those who have difficulty accessing daily necessities, including elderly households in rural mountainous areas and some urban areas where demand density is significantly reduced, distribution and logistics functions will be maintained through collaboration with the public side, in addition to the use of DX and other means.
- In addition, as for the products themselves, the handling of environmentally friendly and health-conscious products will increase, and competition in the development of PB products will intensify due to integration upstream. The company's product differentiation is becoming more distinctive while reducing waste and inefficiencies in the supply chain and business practices, such as excessive inventory, advertising costs, and product returns.
- As people's incomes and living standards rise, especially in Asia, distribution companies that have increased their competitiveness through DX, etc., will also promote international expansion.

(15) Tourism and Creative Industry

Key Points

- On the demand side, the tourism and creative sectors are on a long-term expansionary trend due to the global increase in disposable income. On the digital side, an economic zone of consumption centered on intellectual property (IP) is being built against the backdrop of a shift to a distribution structure that does not depend on media, while the value of real experiences such as tourism, culture and arts, and sports is being reevaluated, and the economic impact is expanding. While some developed countries are actively investing in culture and the arts as a major economic engine, competition for acquisition is intensifying over the growing global demand. On the supply side, a distribution structure directly connected to the global market has been established, resulting in a rapid increase in supply and intensifying competition for consumers' disposable time and points of contact. Competition for management resources such as human resources and capital to design high value-added experiences and conduct high-quality creative activities is intensifying, as cultures unique to each country and region and human creativity become the mainstay of value creation. As the use of digital technology also advances, opportunities for individual creators and others to play an active role will also expand.
- Japan's tourism and creative industries are key industries with international competitiveness. In order to promote the creative industries, it is necessary to promote strategic overseas expansion using local overseas offices, etc., support for realizing international standard production, support for contract negotiations with platform companies, etc., and development of creators. The bottom-up effect of these efforts and the establishment of nation branding, etc., should spread to related industries and add value to them, thereby strengthening the earning power of tourism and inbound tourism.

【Tourism】

＜Global demand changes＞

- Global tourism demand will expand in response to the economic growth of emerging economies such as the countries of the Global South and the increase in the world's overall economic capacity and leisure time due to the progress of industrialization and digitalization of services.
  (However, there continues to be a risk of a contraction in demand in the short to medium term, depending on the future international economic and social environment, such as a slowdown in the global economy, yen appreciation due to interest rate fluctuations, and international outbreaks of infectious diseases.)
- Demand for expensive tourism and lodging experiences by the wealthy will also continue to grow due to the increase in the number of ultra-high-net-worth individuals worldwide, driven by rising financial asset incomes.

＜Changes in the global supply side of the equation＞

- Competition among businesses to capture middle-class tourism demand will intensify across the globe. Most consumers will use tourism-related digital platform providers (e.g., OTAs (Online Travel Agents) and private accommodation platform providers) as a source of information when choosing where to visit and consume and will also tend to make behavioral choices based on their willingness

to visit and consume places and things that are the subject of digital content, such as videos. Therefore, those who can connect to digital platforms, have continuous contact with more consumers, and continue to arouse their desire to spend will have high market competitiveness.

- Competition among companies to capture tourism demand from affluent consumers will also intensify across the globe. Competition will be concentrated on those who can create and continuously provide expensive tourism products targeting the wealthy, and competition for the necessary management resources (advanced design and branding capabilities, large-scale financing capabilities, and human resources with such capabilities) will also intensify.

＜Changes in Japan's Business Structure＞

- The tourism industry's position in Japan's economy will continue to grow as inbound demand (both the number of tourists visiting Japan and per capita foreign consumption in Japan) continues to grow, making it the most important foreign currency earning industry in a country with a declining working-age population, and with the diverse cultural and artistic resources (including crafts) of the non-Tokyo area at its core, As an industry that has the largest positive ripple effect on the economic and social level (wage level, sustainability of infrastructure, etc.), it will achieve the status of a key industry for the country.
  - At the present time in Japan, it has already become an important industry in terms of foreign currency earning effects and ripple effects on related industries (e.g., as of 2023, foreign visitors to Japan will spend approximately 5.2 trillion yen, generating economic value second only to automobiles and semiconductors, the top two export items, and other electronic components), The size of the industry will continue to increase.
- The market competitiveness of Japan's tourism-related industries and companies will grow based on the diversification, uniqueness, and high value-added of customers and services through the use of cultural and artistic resources such as design and art, and sports. In other words, Japan's unique characteristics that differentiate it from other countries (good public safety, reliable infrastructure including punctual public transportation, a geopolitical location that has earned it the trust of both developed and emerging countries such as the US and Europe, buildings and experiences that have spiritual but not religious (SBNR) value, admiration for real-world objects and experiences that have become the subject of world-famous content, Japan's unique cheering culture and watching sports that expose one to the success of one's country's athletes, etc.) will be used as a source of competitiveness, allowing diverse regions and players to build strong relationships with unique, repeat customer bases and grow into an industry that continues to provide high-value tourism and accommodation experiences.

  In terms of specific areas, the following directions will be strengthened.
  - ①Achieve higher unit costs through high value-added investments in art and design in tourism-related industries.
  - ②Business inbound market: As an important geopolitical base, various countries have chosen the city as a base for international conferences, etc. and the user experience, which also leads to tourism consumption, has been carefully designed in various regions.
  - ③Continuous growth of visitors to Japan through overseas development of sports content.

- As a result of this growth, the following positive spillover effects of tourism-related industries on the local economy have been manifested.
  - Establishment of proper pricing practices for B2C products and services in the local economy, and through this, higher wage levels in the local B2C industry. (Higher prices and wages for high value-added services and human resources have become the norm.)
  - Ensure sustainability of living infrastructure in regions with high value-added practices. (Maintenance of roads for access, logistics, etc. are properly maintained as private services due to continued demand for visitation and consumption.)

【Creative】

＜Changes in the structure of global demand＞

- The global creative industries continue to grow, especially in emerging economies such as the countries of the Global South, and consumption of entertainment, travel, clothing, etc. is expected to grow by $18 trillion as the middle-class increases.
- Among creative industries, the market for the content industry in particular has shifted to a distribution structure that is less dependent on media due to the widespread use of smartphones and other general-purpose devices. Consumers can now be exposed to many types of content at the same time, resulting in a structure in which there is competition for disposable time, especially among the digital native generation. As a result, we are also seeing the formation of an "economic zone" (IP creation ecosystem) centered on IP, with progress in the multifaceted use of IP and the formation of fandoms. Japan's "diverse" and "accumulated from the past" content is becoming an environment where it is easy to be demanded by the world.
- On the other hand, physical "experiences" themselves are being re-evaluated and rediscovered, and Koto consumption is increasing, especially among the younger generation. In addition to food, traditional performing arts, and lifestyles unique to Japan, there are growing expectations for art, live entertainment, and design that can make the "experience" more appealing. As Japanese creativity spreads to the world through digital means and is recognized around the world, the economic impact as "experience value" is also expanding.
- In addition, developed countries are actively investing in culture and the arts as a major economic engine.
  - In July 2021, at the G20 Culture Ministers' Meeting, in response to the COVID-19 pandemic, the G20 agreed for the first time in history on "the G20 Declaration on Culture", which positions culture as a major engine for sustainable socio-economic recovery.
  - Culture is a driver of employment, accounting for up to one-twentieth of cultural and creative-related employment in some OECD countries and up to one-tenth in some large cities. These jobs are "future-proof," with 10% having a 4% lower risk of being automated than the general labor force. Culture is also a driver of business growth, with the cultural and creative sector accounting for 7% of all firms in OECD countries and a growth rate of 18%, 6% above the average for all sectors. Furthermore, culture is a driver of consumption, with household spending on entertainment culture increasing by 18% between 2011 and 2019, faster than the faster growth in overall spending (OECD).

＜Changes in the overall global supply structure＞

- To date, Japanese creatives have formed an ecosystem based on the domestic Japanese market and have been slow to respond to the competitive environment of the global market.
- With changes in the distribution structure of the digital content market, transnational dissemination based on a global distribution platform (GPF) has become possible (i.e., the "barrier" to overseas markets has been removed). The entire world is now in an environment that provides opportunities to be exposed to diverse content from various countries (i.e., songs in completely unfamiliar languages can be heard at the touch of a finger).
- Having acquired a diverse consumer base, the GPF has intensified its investment in production companies that create IP to provide diverse, high-quality content. A foothold in the global market is being formed. On the other hand, as individuals have gained direct access to distribution networks, the distribution of individual creative works (UGC) has increased, and it is not uncommon for UGC to become a hit, expanding the field of activity for individual creators.
- Many of the creative workplaces are handled by small and medium-sized companies and individual creators, and this has become a rich creative soil. On the other hand, they face problems related to the subcontracting structure and freelance workers, and there is an urgent need to improve the environment that supports creators. In addition, the advancement of production technology (e.g., 3DCG technology) combined with technological progress has led to an unprecedented increase in the demand for digital human resources.

＜Changes in Japan's Business Structure＞

- The policy significance of Japan's creative industries is considered to be ①economic growth, ②nation branding, ③innovation, ④human capital, and ⑤revitalizing the region.
- The position of the creative industries in the Japanese economy is, for example, the content-related industry accounts for about 14 trillion yen, and the total creative industry is estimated to be about 52 trillion yen, which is not only a large-scale industry but also expected to expand to other industries (economic zone) with IP as its axis. The global creative industry is also expected to grow. The creative industry in the world is expected to grow, and Japanese IP is highly valued in the world due to its diversity and accumulated knowledge from the past. In this way, it is possible to make a significant contribution to Japan's economic growth.
- Furthermore, when viewed from the broader perspective of the "creative economy," the creative industries can make a significant contribution to the creation of innovation from the perspective of promoting creative activities in Japan and can make a significant contribution to the creation of creative human resources, which will be important for the future economy and society. In addition, the diverse cultural infrastructure in various regions of Japan can also be effective in revitalizing local economies (e.g., pilgrimages to sacred sites and social communities through art), which can be expanded globally to improve nation branding.
- In this context, the following directions will be considered for policy formulation to capture the expanding global demand and capture the creative industries and creative economy in the future.
  ① Promotion of a well-defined overseas expansion based on a strategy that takes into account market characteristics.
  (Development of detailed hands-on support according to field and phase)

② Provide production support and creator training support based on the assumption of overseas markets.
(Support for production expenses for high-quality works, support for the development of digital creators)

③ Creation of new business models and promotion of new entrant
(Promote startups, new players, and the use of new technologies)

5. Challenges to achieve future Japan in which each individual will enhance well-being and the results of challenges

- So far, we have shown the changes in global demand and supply that each mission, overall industry, and individual industries face toward a prosperous society, and the changes in Japan's business structure that will progress through public and private initiatives, including New Direction of Economic and Industrial Policies. In this part, we reorganize the issues (challenges) that businesses, the public, and the government must address to realize a prosperous society through these changes from four aspects: domestic investment, innovation/replacement of industries, income growth, and macroeconomic policy.
- Specific measures that need to be considered in the future in response to the challenges presented in this part are described in the Measures section below.

(1) Challenges of Companies, Peoples and Government toward 2040

(Domestic investment: Expansion of the quantity)

- Continuous expansion of domestic investment (e.g., above the expansion speed to achieve 115 trillion yen in investment in FY2027)[51].
- Inward FDI in Japan[52] will increase significantly in terms of ratio to GDP and the imbalance with outward FDI will improve due to the importance of its position in the supply chain, the maturation of the startup ecosystem and its connection to global capital markets, and the improvement of the market environment for increasing domestic investment.

(Innovation/Replacement of industries: Improvement of the quality)

- For companies competing with the rest of the world, only high -value-added headquarters functions (including R&D functions) and production functions will retain in Japan as a "Global Creative Base" such as world headquarters and world factories.
- As a result, the terms of trade[53] will maintain or improve export prices as the weight of high value-added products and services in exports increases[54] due to the higher value-added of individual products and services and the selection and concentration of domestic businesses by GX and DX, while the weight of resources and energy in imports decreases due to the improvement of energy self-sufficiency by GX. The decrease in the weight of resources and energy in imports due to the improvement of energy self-sufficiency through GX will make it difficult for import prices to rise even if resource prices fluctuate, thus maintaining or improving the overall price level.
- The innovation ecosystem[55], including start-ups, universities and research institutes, and human resource development, will be strengthened and innovation will continue to expand.
- Companies will increase their competitiveness through early and rapid restructuring and reorganization[56].

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51 See Reference Materials P11
52 See Reference Materials P62
53 See Reference Materials P64, P65, P66
54 See Reference Materials P67
55 See Reference Materials P70
56 See Reference Materials P68

- In the era of structural labor shortages, people will move to jobs that offer better conditions in terms of wages and work styles. Companies will challenge themselves to survive as "good jobs" that offer continuous wage raising, flexible working conditions and rewarding are the ones that can be supported by young people and hire them .
- Local infrastructure for industry and community and lifestyle-related services will be integrated and operated using digital, automated driving, drones, and other technologies to ensure high quality even in low-density areas, which is difficult to sustain under the current system. However, compact urban planning and land use can be a viable option in the face of extreme depopulation and the potential for higher costs of public services that support individual and social life. Advances of this option, coupled with the use of technology, will make it possible to maintain infrastructure and services that support people's lives.
- Individuals must adapt to the changes of the era and society by using digital technologies. Also, it'll be more popular for peoples to start a business and individuals will be a driver of changes.

(Income Growth：Circulation of generated wealth)

- Under a structural labor shortage and international competition for human resources, companies to retain the human resources needed will not only raise wages, but they will also provide employees' additional reasons for living (a sense of social contribution and flexible work styles).
  - The unemployment rate will remain low[57], especially in rural areas and among working-age workers in structural labor shortages.
  - The social security burden will not increase[58] as much as it has experienced over the past 30 years, since the dependency ratio will remain relatively flat for the time being.
  - To increase wage for essential workers, drastic labor saving (improvement of operation processes and labor-saving investments) and creation of new added value not bounded to public prices through the promotion of services will be required.
- Individuals engaging in reskilling can easily increase their wages by continuing to relearn regardless of age.

(Macroeconomic policy)

- By realizing a genuinely Private sector-led economy, private corporate will become the main source of demand for funds, thereby achieving economic growth and raising people's incomes while also maintaining fiscal sustainability.
- To transform to a Private sector-led economy, the government will move forward and mobilize all its policies and measures, including goal setting, subsidies, taxation, regulatory reform, manner of standardization, and financing, to enhance the predictability of businesses, in accordance with the manner of "large-scale, long-term, and planned" positioned in "New Direction of Economic and Industrial Policies". For the private sector-led economy to take off and continue, the government will encourage the challenging enterprises through the continuation of necessary productive government spending, such as infrastructure investment and industrial policy, as a national strategic investments.

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[57] See Reference Materials P69
[58] See Reference Materials P74

(2) The Result of the Challenges①: Well-being of the Peoples

Key Points

- Continuos wage increases comparable to those in major developed countries will raise incomes (e.g., continuation of nominal wage increases in Japan over the last two years).
- Population density will decrease and two-location living will become more common. Disposable time will increase as digitalization reduces mandatory work hours. The healthiest population (healthy life expectancy is over 75 years), and everyone (elderly, challenged, etc.) can lead an active life.

(Life and income of each individual)

- Wages[59] will rise with the continuation of wage increases comparable to those in major developed countries[60] (e.g., nominal domestic wage increases over the past two years) due to upward pressure on wages from investment, higher labor productivity[61] resulting from innovation and the end of the decline in terms of trade, and structural labor shortages. The social security burden will not increase as much as it has over the past 30 years[62] because the age dependency ratio, which consists of the young (under 15 years old) and the elderly (65 years old and over), excluding the working-age population from the total population, will remain unchanged until at least 2030 (Note that the elderly are not uniformly considered to be those aged 65 and over if we consider the elderly in terms of healthy life expectancy, rather than uniformly considering the elderly as those aged 65 or older, in the case of Japan, the elderly are those aged 74 or older, and by the 2040 target, the elderly are those aged 75 or older, which is 9 to 10 years longer than the age of 65. Thus, reducing the proportion of those considered as elderly. The younger age group will also be considered to be less than 19 years old in light of the longer educational period, and the dependent age population ratio, which is redefined to be more in line with the actual health and educational status, will remain unchanged until 2040). As a result, take-home pay will trend upward. In addition, although electricity and other energy costs will increase due to climate change response, the burden will be weaker because wage growth will be greater.
- Individuals' careers will become more focused on leveraging their expertise, and reskilling will expand with a focus on digital applications. Those who engage in reskilling will be more likely to increase their wages as they continue to relearn without being restricted by age. Entrepreneurship will also become a commonplace option. Against this backdrop of workers' growing awareness of autonomous careers and structural labor shortages, it will become difficult for companies to secure human resources if the traditional rigid Japanese employment system of lifetime employment and seniority-based wages, which is a personnel and wage system, remains in place.
- Work styles will become more flexible according to individual life stages such as child-rearing and nursing care. The L-shaped curve for women will be eliminated, as it has already begun to occur among the younger generation, through the participation of men in child-rearing, nursing care, and household chores as a result of the government's strengthening of child-rearing support and the

[59] See Reference Materials P63
[60] See Reference Materials P72
[61] See Reference Materials P73
[62] See Reference Materials P74

spread of work-style reforms, including to local regions and small and medium-sized enterprises. In addition, women will be able to work in a wide range of jobs, including science, engineering, and digital-related jobs, even in rural areas, which will further increase employment opportunities for women. In addition, the digital society will change all value creation processes, enabling not only women but also all people to create value regardless of age, gender, disability, etc.

- Labor income of the elderly (about 35% of the total population in 2040) will be more likely to grow than public pension income, which will be more likely to trigger macroeconomic slide formula due to inflationary trends. Against the backdrop of increasing healthy life expectancy and structural labor shortages, companies will hire employees regardless of age boundaries. As a result, individual employment will increase under flexible work arrangements, such as part-time work, and the current concept of working age will change[63].
- Household income will rise as a result of higher wages for the working-age population and higher employment income due to longer working terms for the elderly generation, as well as higher financial income due to a shift of household savings to financial investment to compensate for the relative suppression of pension income benefit levels and higher stock prices due to corporate management reform (promotion of value-creating management). This will result in an overall increase in financial income. Furthermore, if companies grant their own shares to their employees, share prices will rise along with the increase in corporate value, and employees' financial income will also increase. Against this backdrop, personal consumption will also continue to expand moderately.
- The unemployment rate will remain low, especially in rural areas and among the working-age population, against a backdrop of structural labor shortages. Companies that continue to raise wages, especially in rural areas and small and medium-sized companies with low wage levels, will be able to recruit human resources. Companies that cannot raise wages can also raise wages through M&A with companies that can raise wages and through business integration work (PMI) to steadily realize the expected effects of M&A. As a result, transaction prices will continue to rise due to the structural labor shortage, which will cause a shortage of supply of goods and services to become an issue. In a structural labor shortage, business closures, bankruptcies, M&A, and PMI do not mean the loss of jobs but the release of resources. For individuals, it will be viewed as an opportunity to move to a company offering better conditions.
- In general, before redistribution through taxes, social security, etc., disparities have tended to widen, as in other developed countries, as production processes and operations, which have been segmented by the introduction of technology, can now be divided globally by location and human resources that are cost optimal for each process and operation, this tended to expand easily. In addition, as a general theory, the older the age group, the greater the disparity due to the accumulation of achievements at a young age and the difference in the choice between retirement and continuing to work, so the aging of the population tended to widen the disparity in society as a whole. In the future, factors such as the implementation of new technologies, domestic investment associated with changes in the international economic order, etc., and rising healthy life expectancy will work to reverse these trends to a certain degree, thereby also working in the direction of reducing disparities.

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[63] See Reference Materials P75

- Specifically, the implementation of new technologies, such as generative AI, will replace employment in clerical jobs that involve routine cognitive and work tasks, while complementing employment in professional jobs that involve high intellectual production activities. At the same time, however, as labor-saving investments in which generative AI is combined with robotics technology, it will complement employment in skilled jobs in manufacturing and service fields that involve atypical tasks, resulting in higher labor productivity and higher wages for essential workers.
- In addition, in response to changes in the international economic order and carbon neutrality, domestic investments to locate production sites for goods that are important for economic security and for value-added goods from a decarbonization perspective will create good jobs in the country.
- Moreover, investments in health will extend healthy life expectancy, allowing people to continue working if they wish as long as they are healthy, which could result in a reduction in disparities in old age.

Furthermore, the redistribution of tax and social security benefits will not significantly change the post-distribution gap from what it is today. As a result, overall, many citizens will secure a better standard of living than if the current stagnation continues.

(Note: Depending on the degree of progress in generative AI and robotics, there could be a scenario in which even skilled manufacturing and service jobs involving atypical tasks are replaced and people no longer need to work. In such a scenario, a fundamental review of the redistribution system, including the introduction of a basic income system, would be necessary.)

- The increase in added value of the industry, which is the premise for wage increase, is the result of the simultaneous progress of mission and OS reconfiguration (added value through green market acquisition, added value through supply structure transformation through digitalization, added value through choking against the backdrop of economic security), driven by the necessity of macro environmental changes and social issues. (Value-added improvement by acquiring green market, value-added improvement by transforming supply structure through digitalization, value-added improvement by acquiring health demand and saving labor against the backdrop of declining birthrate and aging population, etc. The details are scenarios for each mission and industry, and the integrated picture is described in "Overall Industry Changes"). In the region, manufacturing base investment and industrial infrastructure investment will be made in areas where distinctive industries arise, and working-age people will flow into areas near workplaces where it is easy to raise children and care for family members (e.g., manufacturing using decarbonized power sources in Hokkaido and Kyushu, hydrogen and ammonia complexes in Tokyo Bay and the Setouchi region, offshore wind power in Tohoku, etc.[64]).
- Living infrastructure (transportation, childcare/nursing care) will be difficult to maintain due to aging if the status quo is maintained, but if managed digitally and efficiently, it can be made operational even in rural areas where structural labor shortages are severe. Raising the wages of essential workers will require drastic labor saving (improvement of business processes and investment in labor saving) and the acquisition of new added value not bound by official prices through the promotion of services outside the public insurance system.

64 See Reference Materials P36

- Individuals will have more disposable time, be free from time and place constraints, and lead more sustainable lives in terms of the environment and health as a result of digitization, automation, decarbonization, and more flexible work styles. For example,
  - More time for leisure because less time is required for work, travel, housework, etc.
  - Increased personal DX literacy will make life more convenient and lower costs for service providers.
  - With a decrease in population density, coupled with more flexible work styles and other factors, two-location living will become less special.
  - Dwellings will be increasingly equipped with electric vehicles that can store electricity and have solar power installed on walls and other surfaces, and lighting and heating will be optimized to suit lifestyles.
  - There will be a modal shift, with an increase in travel by rail and bicycle.
  - The circular economy will lead to a shift to environmentally oriented lifestyles, including the reuse and extended life of products, the spread of recycled products, and a reduction in food loss through sales of just the right amount of food in just the right amount and in just the right portions.
  - The use of lifelog data obtained by wearable and IoT devices will replace all products and services related to daily life with health-oriented ones, ranging from food, fitness, esthetics/relaxation, functional bedding, health-oriented home appliances, and health tourism. health-oriented products and services.

(3) The Result of the Challenges②: Japan's economic situation

Key Points
・ GDP will grow at a positive rate by a higher level of labor productivity than the rate of decline of the working-age population.
・ The government will eliminate its excess investment, accompanied by an increase in fiscal spending, as companies overinvest.

(Macroeconomic environment)

- GDP will grow at a positive rate by a higher level of labor productivity than the rate of decline of the working-age population and maintaining the labor participation rate. GDP per capita will also grow positively.
- The global inflationary trend will continue due to the declining falling fertility rate, aging population, and expanding geopolitical risks. Japan will also experience mild inflation due to global price trends and the continuing trend of wage hikes against the backdrop of structural labor shortages.
- The nominal interest rate (the average of JGB interest rates, including long-term and short-term, which is the market's guide) will rise in response to these price trends. However, because interest rates on existing bonds are low, no major fluctuations will occur in the near term. While maintaining the safe asset status of JGBs, interest rates will rise while growing, and although temporary reversals will occur, structurally growth rate > interest rate will continue. Real interest rates will remain negative or close to negative as prices continue to rise.
- The current account[65] balance will remain in surplus structure. The trade balance[66] will improve due to increased exports on the back of increased domestic investment, including inward FDI in Japan, and reduced imports from the energy sector as a result of increased energy self-sufficiency through GX. The income account balance[67] will remain in the black despite an increase in inward FDI in Japan due to past accumulation, including the world's largest net foreign assets, [68] and the expansion of investment in local subsidiaries as companies expand overseas. The services balance[69] is expected to improve due to an increase in the digital deficit[70] caused by DX and an increase in the surplus resulting from the expansion of inbound travel.
- I-S balance[71] will become the main source of demand for funds (excess investment) as private corporations continue to expand domestic investment at a pace exceeding the ¥115 trillion investment target for FY2027, thereby eliminating the excess savings. Households will maintain their excess savings even as the ratio of elderly citizens increases, and the government will eliminate its excess investment on the back of higher tax revenues from economic growth and other factors.

65 See Reference Materials P77
66 See Reference Materials P78
67 See Reference Materials P79
68 See Reference Materials P80
69 See Reference Materials P81
70 See Reference Materials P82
71 See Reference Materials P83

Ⅲ. Past and ongoing Measures for Future Japan in which each Individuals will enhance well-being

1. Proposed Main measures to realize a positive cycle of domestic investment, innovation and income growth

- In the Future Outlook, we have presented a picture that can be realized as an extension of the way of doing things and thinking that the "New Direction of Economic and Industrial Policies" has shown, and we have also presented the challenges that will lead to this picture.
- In this part, we first present the major measures that need to be considered in order for the government to address these challenges. First, the measures to be taken at the macro level across sectors are organized into three groups from the perspective of "realizing three positive cycles of domestic investment, innovation, and income growth," which was set as a goal in the Second Report.
- Policies and measures positioned from the same perspective in the second report include, for example, support[72] that goes beyond initial investment in strategic areas, intensive support[73]for medium-sized companies, an innovation base tax system[74], and the establishment of a law to revise the Industrial Competitiveness Enhancement Act to make startup-related measures more concrete. The government has made steady progress in the area of policy measures, for example, by enacting a law to revise the Industrial Competitiveness Enhancement Act[75] in order to make specific measures related to start-ups.
- Based on this progress, the following major measures are positioned as initiatives for further challenges. Through these measures, we will achieve both the realization of long-term sustainable economic growth by promoting private investment based on future growth expectations, increasing the added value of corporate activities, and transforming the economic and industrial structure, and the resolution of social issues in the fields addressed by the "Mission-Oriented Industrial Policy".

(1) Expansion of domestic Investment

- To continue to expand domestic investment and increase inward FDI, the following main measures will be implemented.

① Regarding GX, improving the predictability of the business environment and promoting domestic investment that will maintain and strengthen high-value-added industrial processes essential for growth, the "GX2040 Vision" will be presented from a longer-term perspective by comprehensively examining industrial structure, industrial location, and energy.

② Coping with the risk of energy price hikes and supply disruptions, and getting rid of the worsening balance of trade, in addition to thorough energy conservation, the government take measures to improve the business environment to expand the supply of decarbonized energy sources such as renewable energy and nuclear power, which will contribute to improving energy self-sufficiency, as well as promote the social implementation of low-carbon hydrogen and other technologies such as CCS.

③ To strengthen the semiconductor supply chain, the government continue to develop domestic production bases and human resource development, aiming to supplement missing pieces in Japan.

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72 See Reference Materials P91, P92
73 See Reference Materials P89
74 See Reference Materials P93, P94
75 See Reference Materials P90

In particular, the government will consider necessary legislative measures and provide R&D support for the mass production of next-generation semiconductors.

④ With achieving the goal of establishing a domestic manufacturing base for 150 GWh/year, and the government provide necessary support for the practical application of next-generation batteries.

⑤ Maintaining and developing Japan's industrial and technological base, the government will establish a system for threat and risk analysis, provide investment support for acquiring technological advantages, strengthen technology management measures including a framework in new trade controls, and strategically collaborate with industry and major countries.

⑥ Considering how to support the development and expansion of contract development and manufacturing bases in the fields of biopharmaceuticals, regenerative medicine, cell therapy, and gene therapy.

⑦ Considering strengthening support for upstream development overseas and other measures to strategically secure base metals and important minerals, such as copper resources, necessary to respond to electrification associated with the progress of GX and DX and to promote related domestic investment.

⑧ To realize the effects of these domestic investments, the effective utilization and development of basic infrastructure such as industrial water supply and the effective utilization, development, and accumulation of industrial sites in each region will be promoted, while further addressing supply constraints such as labor shortages, including the promotion of the use of AI and robots.

⑨ Strengthening efforts to attract FDI projects in Japan that contribute to innovation and regional revitalization, promote collaborative partnerships with overseas companies, and provide accompanying support to regions that attract such projects.

(2) Acceleration of innovation and replacement of industries

- To compete on the world stage and become a Global Creative Base, the following main measures will be implemented.

① Regarding GX, the government will consider the concrete design of the emissions trading system (GX-ETS), which is scheduled to be launched full-scale FY2026. The government will combine support measures with regulatory and institutional measures to form a market, including collaboration with like-minded countries; establish GX supply chains with like-minded countries through coordination of GX investment promotion measures, etc., and the government will also promote further actions of AZEC.

② To improve the performance of AI and formulate computing power, the government will promote R&D to secure computational resources, develop data in promising fields, create an environment to utilize data which is obtained through AI utilization to improve performance, increase the efficiency of computational resources, and encourage innovation by excellent companies and human resources from Japan and abroad. In addition, the AI Safety Institute will play a central role in formulating safety standards through international collaboration, while also considering rules and regulations.

③ To promote the creation of new value through digitalization, we will create specific examples of the Ouranos Ecosystem, a cross-industrial data sharing initiative and promote global collaboration.

④ To strengthen economic partnerships with the Global South, a framework for developing third country partnerships with the Middle East, Africa, etc. in an aerial manner will be established

together with India, and strategic initiatives in priority sectors and countries will be developed from this starting point as a package, including infrastructure construction and strengthening of financing (strengthening NEXI functions, etc. will be considered).

⑤ To promote innovation in cutting-edge fields, the government will consider how to provide policy support for biotechnology, quantum, space (further utilization of the Space Strategy Fund at JAXA), etc.

⑥ To create globally successful startups, etc., the government will strengthen support for growth stage, promote M&A through flexible asset evaluation of "goodwill", etc., strengthen criteria for maintaining listing on the TSE Growth Market, etc., improve the market environment for startups to grow significantly, such as the secondary market, etc., and develop a market environment where large companies and universities can develop their businesses. Consider institutional reforms to promote the mobility of innovation resources such as dormant human resources and facilities in large companies and universities.

⑦ To promote companies' replacement of businesses, the government will consider legislation on a pre-insolvency proceeding that allows the reduction of financial debts through a majority vote without requiring the consent of all lenders and will review the corporate reorganization tax system, including tax treatment on partial spin-offs (a special treatment for tax on built-in gains on the transferred assets and dividends to shareholders in spin-offs in which the parent company retains a minor portion of shares of the SpinCo). In particular, in order to promote the structural transformation of SMEs, the budget, taxation system, and other related policies will be reviewed in the direction of strengthening the support for growth-oriented SMEs.

- To support industries which challenge to improve Quality of Life, the following main measures will be implemented.

① To promote the growth of SMEs that create quality jobs in the region, the budget, taxation system, and other related policies will be reviewed in the direction of strengthening the support for growth-oriented SMEs.

② To promote the industrialization of healthcare (health, medical care, and nursing care), which has great potential amid the aging of the population, develop PHR, etc., which will serve as a foundation for linking healthcare data on an individual bases, create new businesses by providing companion support for healthcare startups, and establish a mechanism to promote nursing care businesses according to regional characteristics, including collaboration with work areas.

③ To promote the creative industry, the government will promote strategic overseas expansion using local overseas offices, etc., assist in realizing international standard production, support contract negotiations with platform companies etc., and foster creators. Through these efforts, we will also enhance the earning power of tourism and inbound tourism by increasing the added value of other industries.

④ Based on the "Digital Lifeline Development Plan," the government will promote the nationwide development of digital lifelines (hardware, software, and rules) that conform to common specifications, etc., and fundamentally promote the use of automated driving, drones, and other digital services by the public.

(3)Income growth

- To circulate the wealth generated by domestic investment, innovation and replacement of industries, the following main measures will be implemented.

① Fostering local leading medium enterprises that can provide quality employment through wage increases and work style reforms and putting them on a further growth.

② Considering measures to strengthen price shifting by enhancing enforcement of the Act against Delay in Payment of Subcontract Proceeds, Etc. to Subcontractors (e.g., through cooperation with the JFTC and ministries and agencies with business jurisdiction) and thorough price shifting of labor and other costs in public sector demand.

③ Promoting further measures to address supply constraints such as labor shortages, including promotion of the use of AI and robots.

④ To promote the industrialization of healthcare (health, medical care, and nursing care), which has great potential amid the aging of the population, develop PHR, etc., which will serve as a foundation for this, create new businesses by supporting accompanying healthcare startups, and establish a mechanism to promote nursing care businesses according to regional characteristics, including collaboration with work areas to promote the industry of nursing care.

2. Past and ongoing sector-specific measures

- In this part, based on the eight missions and five operating systems that have been organized by Committee on New Direction of Economic and Industrial
- Policies, Industrial Structure Council, we reorganize them into eight missions and four operating systems that integrate global and economic security in light of the current scenario and indicate the progress of measures and measures that need to be considered in the future.
- In addition, as indicated in the second report, in order to continue effective measures, it is important to define indicators to monitor the progress of the three positive cycles of domestic investment, innovation, and income growth in the Japan's economy as a whole, as well as in each of the sectors addressed in New Direction of Economic and Industrial Policies, while making course corrections It is important to continue to implement these measures while making course corrections. To this end, we will continue to set long-term goals and implement measures accordingly.
- In the following, for each of the eight missions and four OSs, ①the long-term goals set in the Second Report, ②the progress of the measures that have been taken since the Second Report, and ③the measures that need to be considered in the future based on these goals are presented.

＜Mission-oriented industrial policy＞

（1）Realization of a carbon-neutral society（GX）

① Long-term goals for the foreseeable future

- For 10 years, public-private investment of over 150 trillion yen and government support of 20 trillion yen will be realized.
- Achieve carbon neutrality in 2050.

② Progress since second report of the committee

【Pro-Growth Carbon Pricing Concept】

- The "Future milestones" of GX Priority Fields were clarified...The "Future milestones" of 22 fields presented as a reference material for the Basic Policy for the Realization of GX was broadly grouped into 16 fields, etc., and each priority field was discussed in the "Working Group of Experts for the Realization of GX". The "Sector-specific Investment Strategies" were compiled by the GX Implementation Council.
- Advance investment of 20 trillion yen ... In December 2023, the "Sector-specific Investment Strategies" were compiled, and the strategies outlined concrete investment-promotion measures that use part of the 20 trillion yen, such as conversion of manufacturing processes and fuels in industries where emission reductions are difficult, and establishment of domestic manufacturing supply chains in GX fields. The strategy outlines specific measures to promote investment, such as the conversion of manufacturing processes and fuels in industries that have difficulty in reducing emissions, and the establishment of domestic manufacturing supply chains in GX sectors[76].
- Issuance of "GX Economy Transition Bonds"... In November 2023, the Climate Transition Bond Framework was formulated and second party opinions on the Framework by domestic and foreign external evaluation organizations were released. IR was conducted for domestic and foreign

[76] See Reference Materials P87

investors, and the first "GX Economy Transition Bonds" worth approximately 1.6 trillion yen were issued in February 2024.

- Experimentally launch of the emissions trading system in the GX League (from FY2023) … "The GX League" launched a pilot emissions trading system in April 2023, and in March 2024, the companies accounting for over 50% of Japan's CO2 emissions have participated in the scheme. For high-emissions companies, participation in the GX League is a requirement to receive governmental support that uses revenues from the "GX Economy Transition Bonds". In addition, the carbon credit market was opened on the Tokyo Stock Exchange in October 2023.
- Full-scale launch of the emissions trading system (from FY2026) … While observing the progress of "the emissions trading system" in the GX League and international trends, the government is considering further development of the scheme, such as measures to further increase participation rates, private third-party certification of reduction targets based on government guidelines, and strengthening discipline (guidance and supervision, compliance obligations, etc.) for achieving targets.
- Introduction of GX-surcharge (surcharge on fossil fuel supply) (from FY2028) and auctioning (from FY2033) … Based on Article 11, Paragraph 2 of the Supplementary Provisions of the "GX Promotion Act", the ways to implement the system are being discussed, including specific measures for the full-scale launch of the emissions trading system.
- Utilization of new financing methods…In October 2023, ideas on how to resolve issues related to financed emissions were complied. In addition, in preparation for the launch of the GX Acceleration Agency in summer 2024, 120 billion yen was appropriated in the FY2024 government budget plan for the agency's financial support services such as organizational management and debt guarantees, while necessary government ordinances and other measures were enacted.
- Addressing challenges in multi-enterprise collaborations…The Ministry of Economy, Trade and Industry (METI) provided the Japan Fair Trade Commission (JFTC) with information on joint activities in the Shunan petrochemical complex. The JFTC proactively responded to the consultation, also taking into account the information provided, and the case was published in February 2024 as a consultation case that does not pose a problem under the Antimonopoly Law. In addition, when the JFTC was revising the guidelines, the JFTC consulted with METI, which provided comments based on industry's requests, and the revised guidelines were published in April 2024.
- Green Innovation Fund…The fund has been utilizing 756.4 billion yen, which was expanding to FY2023 by additional fund of the GX Economic Transition Bonds, to structure brand new projects, and also to accelerate and expand the existing projects of developing of innovative decarbonization technologies, such as hydrogen reduction ironmaking, which is highly effective in reducing CO_2 emissions and perovskite solar cells, which is known as Next-Generation Solar Cells originated from Japan.
- New tax measures to promote domestic investment…In order to attract new domestic investment from companies, tax credit measures which are proportionate to production amount will be provided for sectors such as electric vehicles, green steel, and SAF, etc., where investment decisions are not easy to make due to high costs, especially in the production stage.
- Hydrogen Society Promotion Law and CCS Business Law passed…The Cabinet approved the "Hydrogen Society Promotion Law" and the "CCS Business Law" at the ordinary session of the

Diet this term and submitted them to the Diet for approval. The two bills, the Act on Promotion of Low Carbon Hydrogen Supply and Use and the CCS Business Act, respectively, will promote GX in industries such as steel and chemicals, mobility, and power generation, which are difficult to decarbonize.

【International Expansion Strategy】

- Formation of green market…Created examples of financial institution's' use of the GX League's Management Promotion WG on the amount of reduction contribution and disseminated them at COP and other international forums for discussion.
- Promote GX in Asia…AZEC Leaders' Summit was held in December 2023…AZEC Leaders' Joint Statement was adopted, and Leaders agreed on the following.
  ① Basic principles for decarbonization (simultaneous realization of decarbonization, economic growth, and energy security, and realization of net zero through various pathways)
  ② Support for policy development (launch of the Asia Zero Emissions Center at ERIA) and promotion of public-private partnerships (welcome the AZEC Advocacy Group)
  ③ Strengthening cooperation in the area of decarbonization technologies, greening the supply chain in the manufacturing sector, and promoting transition finance

【Fair transition, GX for society as a whole, including small and medium-sized enterprises】

- Reskilling support…Discussions have started at the GX League's GX Human Resources Market Creation WG on activating the labor mobility market for GX human resources. It is simultaneously promoting the acquisition of new skills and smooth labor mobility to growing sectors, including green sectors, through job change support for career advancement of incumbents and reskilling support for employees by companies.
- Promotion of GX for small and medium-sized enterprises…Under the CN Investment Promotion Tax Credit, measures for small and medium-sized enterprises (SMEs) that are boldly decarbonizing their businesses have been expanded and the applicable period has been extended. In addition, the FY2023 supplementary budget provides for capital investment to promote energy conservation, support for the development of products and services that contribute to GX, and energy conservation diagnosis projects. In addition, the Organization for Small & Medium Enterprises and Regional Innovation, Japan (SMEs) provided consultation services and training for SMEs and support organizations.
- GX Startup Support…41 billion yen was allocated in the initial budget for FY2024 (total 200 billion yen for 5 years). The government will consider investment support at the capital investment stage, which is integrated with the existing support at the research and development stage.
- Promote GX in regions and lifestyles…In the supplementary budget for FY2023, approximately 200 billion yen was allocated to support the introduction of highly efficient water heaters and renovation to insulated windows, etc. In addition, demand for products with high CO2 emission reduction performance was stimulated through promotion of "Deco-Katsu"action.

【Progress evaluation and review】

- Periodic progress evaluation and review…Based on the progress of GX investment, global trends and their impact on the economy, and trends in technological development, the GX Implementation Council and others will listen to a variety of opinions, conduct regular progress assessments, and effectively conduct necessary reviews. The GX Promotion Strategy also clearly states regular progress assessments and effectively conduct necessary reviews.

③ Measures that need to be considered in the future

【Pro-Growth Carbon Pricing Concept】

- Regarding GX, improving the predictability of the business environment and promoting domestic investment that will maintain and strengthen high-value-added industrial processes essential for growth, the "GX2040 Vision" will be presented from a longer-term perspective by comprehensively examining industrial structure, industrial location, and energy.
- Further efforts will be implemented in the Green Innovation Fund Projects to achieve carbon neutrality in 2050.
- Coping with the risk of energy price hikes and supply disruptions, and getting rid of the worsening balance of trade, in addition to thorough energy conservation, the government take measures to improve the business environment to expand the supply of decarbonized energy sources such as renewable energy and nuclear power, which will contribute to improving energy self-sufficiency, as well as promote the social implementation of low-carbon hydrogen, including ammonia, synthetic methane, synthetic fuels, and other technologies such as CCS.
- With considering the emissions trading system (GX-ETS), which is scheduled to be fully operational from FY2026, the government will combine support measures with regulatory and institutional measures to form a market, including collaboration with like-minded countries.
- Conducting analysis, etc. on carbon leakage potential.
- Addressing challenges in multi-enterprise collaborations…The Japan Fair Trade Commission and METI will work together to encourage enterprises to take action, such as by conducting public awareness campaigns, and will continue to improve the predictability of the business environment for the realization of GX, taking into account the progress of enterprises' initiatives.
- Considering strengthening support for upstream development overseas and other measures to strategically secure base metals and important minerals, such as copper resources, necessary to respond to electrification associated with the progress of GX and DX and to promote related domestic investment.

【International Expansion Strategy】

- Establishing GX supply chains with like-minded countries through coordination of GX investment promotion measures.
- Utilize AZEC, a cooperative framework for decarbonization in Asia, to promote sectoral cooperation and GX initiatives in an integrated manner, including support for decarbonization policy formulation through the Asia Zero Emissions Center and promotion of the introduction of Japanese GX technologies, as agreed at the AZEC Leaders' Summit in December 2023.
- Promoting efforts to create examples of transition finance in Asia.

- Strengthening efforts to prevent LNG from becoming a stranded asset in cooperation with the IEA and other organizations.
- Establishing standards for the creation of bio-product value (measurement methods for calculating LCA values, methods for proving "raw CO2") in order to market bio-derived materials and products.

【Fair transition, GX for society as a whole, including small and medium-sized enterprises】

- Reskilling support
- Promoting GX for SMEs, supporting GX Startup and promoting GX in regions and lifestyles.

(2) Realization of a digital society (DX)

① Long-term goals for the foreseeable future

- By 2030, the total sales (semiconductor-related) of companies producing semiconductors in Domestic will exceed 15 trillion yen.
- Develop a nationwide digital lifeline spanning hardware, software, and rules.
- Realize an ecosystem for digital skills development through the management of individual digital skills information.

② Progress since second report of the committee

【Individual Company DX】

- Measures to promote DX for individual companies utilizing evaluations from the capital market, etc. ...Digital Governance Code, Digital Transformation Certification, DX Stocks, DX investment promotion taxation, etc. were implemented.
- Promotion of management and business process reforms in conjunction with "Value Creation Management" ...Introduction of PBR indices in the selection of DX Stocks, etc. were implemented. Mainly for small and medium-sized enterprises (SMEs), direct individual company support measures for SMEs (IT introduction subsidies, DX selection, etc.) and corporate digitalization and DX not only through individual DX support measures but also through regional financial institutions and other regional support organizations (e.g., formulation of DX support guidance for support organizations, etc.)were implemented.

【Digital Industrial Infrastructure】

(Semiconductors and Electronic Components)

- Development of manufacturing infrastructure for semiconductors, electronic components, and their manufacturing equipment, materials, and raw materials...Support was provided through the Advanced Semiconductor Fund and the Economic Security Fund[77].
- Support for research and development to establish design and manufacturing infrastructure for next-generation semiconductors...Support was provided through the Post-5G Fund[78].
- Semiconductor human resource development... (see "【Digital Human Resource Infrastructure】" below)
- Promoted international cooperation with volunteer countries and regions to strengthen supply chains, etc.
- Continued and strengthened R&D support for game-changing technologies such as optoelectronic fusion.
- Promoted infrastructure development associated with the establishment of semiconductor production bases.

(Information Processing Infrastructure)

- Toward strengthening the development capability of generative AI,

77 See Reference Materials P88
78 See Reference Materials P88

① Support was provided for the development of public and private sector computational resources essential for development, utilizing the Economic Security Fund and other resources.
② To promote the development of basic models by startups, etc., support was provided using the Post-5G Fund.

- Building information processing infrastructure through industrialization of quantum technology... Research and development for the establishment of quantum and classical computing technology was supported with Research and Development Project of Enhanced Infrastructures for Post 5G Information and Communication Systems. The development of use cases utilizing quantum computers was supported through Development of Quantum-Classical Hybrid Use-Case Technologies in Cyber-Physical Space and the Economic Security Fund. Furthermore, to promote industrial use of quantum computers, Global Research and Development Center for Business by Quantum-AI technology (G-QuAT) was established at AIST in July 2023.

(Battery)

- Expansion of the manufacturing base for batteries and sub-materials...Utilizing the Economic Security Fund, plans for 3 batteries and 12 battery part materials were approved. Efforts are underway to further expand the manufacturing base for batteries and sub-materials, and measures have also been taken for battery manufacturing equipment.
- Establishment of a public-private partnership system to secure upstream resources and expansion of JOGMEC's functions...JOGMEC established a Business Strategy Division and developed a system to coordinate projects related to identifying projects for upstream resource investment and the participation of Japanese companies.
- Strengthening global supply chains by promoting strategic alliances of like-minded countries and overseas expansion...A "Memorandum of Cooperation on Battery Supply Chain" was signed with Canada, which has upstream resources.
- Creating new innovations in the battery field through the promotion of technological development of next-generation batteries and human resource development...The company is supporting the technological development of all solid-state batteries and their component materials, which are next-generation batteries, and the development of recycling technologies for batteries. In addition, to develop battery human resources, we have created educational materials for high school and technical college students. In addition, the direction of future battery human resource development was compiled.

(Advanced Information and Communication Infrastructure)

- Promote regional decentralization of data centers...In the data center regional base development project, support was provided for the development of core data centers to complement and replace those in the Tokyo and Osaka areas.
- Strengthening Japan's competitiveness for the advancement and international deployment of telecommunications infrastructure, etc... Support was provided for international collaboration, including Japan-US collaboration, and R&D, including PoC, at overseas sites to expand open RAN. Public solicitation of R&D in post-5G funds for local 5G, energy saving, etc. was conducted.

- Utilization of the 5G Deployment Promotion Tax Credit to promote domestic 5G base station development and local 5G deployment...So far, 2 national 5G deployment plans and 19 local 5G deployment plans have been approved.
- Promoting Energy Saving in Data Centers...Utilizing the Post 5G Fund and the Green Innovation Fund, etc., the government supported research and development of semiconductor and cloud technologies that contribute to energy saving in data centers.

【Digital Infrastructure Platform】

(Ouranos Ecosystem)

- Published the 4D Spatio-Temporal Data Platform Architecture Guidelines (γ version) and expanded the functionality of the OSS (Open Source Software) published on Github based on the guidelines.
- The project promoted efforts to develop an IDI for batteries, etc., with the goal of starting service provision by the end of FY2024.

(Cyber Security)

- Revision of criteria and further dissemination of Cyber Security Help Corps service...In addition to continuing support for IT introduction subsidies, the service can also be provided to relatively large SMEs that are difficult to target under the current criteria and to companies that want to introduce more advanced security measures. The criteria were revised so that the service can also be offered to small and medium-sized enterprises and enterprises that want to introduce more advanced security measures, which are not covered by the current criteria.
- Securing technology to improve the cyber coping capability of the entire country through cooperation between industry, academia, and government...The entity to conduct research and development on advanced cyber defense and analysis capability enhancement through the Economic Security Key Technology Development Program has been decided, and the project implementation is scheduled to start within FY2024. The project is scheduled to start within the fiscal year 2024.
- Creating an environment for secure software distribution and IoT security...Guidance on Introduction of SBOM for Software Management and a draft policy for the security conformity assessment scheme for IoT products (hereinafter referred to as "IoT security conformity assessment scheme") was developed and published.
- Ascertaining the full picture of cyberattacks and preventing the spread of damages...A report and other documents to promptly share information on cyberattacks through expert organizations were compiled.

(AI Governance)

- The "AI Guidelines for Business" was published as a unified guidance of AI governance to the entities in Japan.
- "The AI Safety Institute (J-AISI)" was established as an organization to study and promote evaluation methods and standards for AI safety.

【Digital Human Resource Infrastructure】

(Human Resources for Digital Promotion)

- Implemented human resource development measures to realize the government-wide target of developing 2.3 million digital promotion human resources by the end of FY2026.
- Human resource development for the utilization of generative AI: Presented the "Approaches to human resources & skills required for DX promotion in the age of generative AI," revised the "Digital Skill Standards," expanded the base of learning through increasing the number of companies participating in the "Digital Human Resource Development Platform," and revised IT Passport examinations that are compatible with generative AI.
- Reinforcement of digital human resource development functions at universities and technical colleges by reorganizing faculties and increasing in the capacity of students in digital fields.
- Expansion of support business by mentors and horizontal development of training...Expansion of the scale of training in the "MITOU Project" (Information-technology Promotion Agency, Japan) to realize the target (500 persons per year by FY2027), horizontal development of unexplored discovery and training methods to local regions, and expansion of the training function of other independent institutions (NEDO, AIST, etc.).
- Cooperation of various measures to realize consistent digital human resource development from universities and technical colleges to working adults.

(Semiconductor Human Resources)

- Fostered semiconductor human resources through regional industry-academia-government collaboration (e.g., implementation of new curricula at educational sites and delivery of classes by companies), and laterally expanded to regions where there are needs.
- International cooperation on the promotion of semiconductor human resources development was promoted.

(Battery Human Resources)

- Collaboration between industry, academia, and government to organize learning content and instructional methods for educational programs.

【Web3.0】

- In the 2024 tax reform, cryptographic assets held by third parties that meet certain requirements are exempted from year-end market value taxation.
- An amended law was enacted to add cryptoasset under the Payment Services Act to the investment targets of LPS.
- In September 2023, the Japanese Institute of Certified Public Accountants and industry associations formulated and published guidelines for accounting audits of Web 3.0 businesses (METI participated as an observer in the study group along with the Financial Services Agency).
- In addition to providing support for the creation of Web 3.0 and blockchain use cases and the establishment of communities in the supplementary budget for FY2023, a survey on human resource development related to Web 3.0 and blockchain technology was conducted in a survey commissioned in FY2023.

③ Measures that need to be considered in the future

【Individual Company DX】

- Promote management and business process reforms in conjunction with "value creation management" (e.g., formulate smart manufacturing guidelines).
- Promote areal corporate DX through regional financial institutions and other regional support organizations (e.g., create model cases in line with DX support guidance, build a DX case database, etc.).

【Digital Industrial Infrastructure】

(Semiconductors and Electronic Components)

- To strengthen the semiconductor supply chain, continue to develop domestic production bases and human resource development, aiming to supplement missing pieces in Japan. In particular, to prepare for the mass production of next-generation semiconductors, we will consider necessary legislative measures and provide R&D support.
- Continue and strengthen support for the development of manufacturing infrastructure and R&D. In particular, strengthen support for missing pieces in the semiconductor and electronic components supply chain in Japan (e.g., advanced package development centers, design and development of next-generation semiconductors, etc.).
- Provide support for financing for investment in the mass production of next generation semiconductors and strengthen governance from the perspective of economic security.
- Promote infrastructure development associated with the establishment of semiconductor production bases.
- Respond to PFAS regulations.

(Information Processing Infrastructure)

- Promote the development of computational resources and data on promising fields and regions necessary for the development and utilization of AI.
- Promote the development of an environment in which data, etc. obtained through the utilization of AI can be used to improve the performance of AI models.
- Promote research and development to improve the efficiency of computational resources.
- Through the above efforts, innovation by excellent companies and talents both domestically and internationally will be promoted.

(Battery)

- Further expand the manufacturing base for batteries, sub-materials, and manufacturing equipment in Japan and overseas.
- Promote the strengthening of the global supply chain, including breaking away from dependence on specific countries.
- Continue technological development of next-generation batteries and promote initiatives to capture the next-generation battery market.

(Advanced Information and Communication Infrastructure)

- Promote energy conservation in data centers.
- Strengthen Japan's competitiveness for upgrading and international deployment of telecommunications infrastructure.... Continue international collaboration and R&D support, including PoC at overseas sites, to expand the use of open RAN. In addition, amid concerns about the growing demand for electric power, such as the expected integrated operation of information processing and information communications, including AI, we will engage in research and development of energy-saving base stations, etc., including local 5G.
- Promotion of local 5G... Support the introduction of local 5G through taxation and provide support for the creation of good use cases.

【Digital Infrastructure Platform】

(Ouranos Ecosystem)

- To promote new values creation through digitalization, specific examples will be created, and global collaboration will be advanced for Ouranos Ecosystem, an initiative for cross-industrial data sharing.
- Expand the functionality of OSS (Open Source Software) in line with the updated guidelines.
- Revise the Enforcement Regulations and Guidelines for the Act on the Promotion of Information Processing and establish a certification system for public interest digital platform operators.
- Information Promotion Agency (IPA) will be made a standards organization under the jurisdiction of the Digital Agency to promote the formulation of standards and norms in the digital domain.
- Based on the "Digital Lifeline Development Plan" promote the nationwide development of digital lifelines (hardware, software, and rules) that conform to common specifications, etc., and fundamentally promote the use of automated driving, drones, and other digital services by the public.

(Cyber Security)

- To enhance the effectiveness of cyber security measures to strengthen measures throughout the supply chain, establish a framework to define cross-industry security measure levels and visualize the measures taken by each company, while managing and centralizing guidelines in cooperation with IPA. At the same time, the framework will promote the establishment of requirements for government procurement, etc., regarding the level of countermeasures based on the framework.
- As a leading example of the above, the IoT Security Conformity Assessment Scheme will be partially put into operation in FY2024, and we will promote the use of IoT products certified under the system in government procurement, etc., while encouraging industry to utilize the system. At the same time, international collaboration will be further promoted to ensure interoperability with similar systems in Europe, the U.S., and other countries.
- To seek policies necessary to ensure cyber security in the semiconductor-related industry, where domestic investment is being strongly promoted, the government will promote the identification of actual conditions and surveys and establish a forum where companies in related industries can autonomously share their cyber security measures, awareness of problems, and case studies.
- From the viewpoint of international institutional harmonization, measures to ensure software security, including the concept of Secure by Design and the use of SBOM, will be promoted by

conducting demonstration projects, which will further disseminate the concept to the industry, and making them requirements for government procurement, etc..

- For small and medium-sized enterprises (SMEs) that have difficulty in securing sufficient resources, support measures will be implemented, such as organizing effective security measures and methods required according to the size of the enterprise, dispatching experts to address the shortage of security personnel, and promoting the spread of cyber security help squad services after the revision of the standards.
- To build an ecosystem for the expansion of the security market, we will promote the structuring of the "security industry" and research on industrial promotion models in other countries. In addition, we will propose necessary policies, including measures to support startups, and strongly promote measures to train and secure high-level security personnel, such as promoting the use of information processing security specialists (registered security specialists).
- Promote research and development related to the enhancement of advanced cyber defense and analysis capabilities in the form of cooperation between industry, government, and academia (Economic Security Critical Technology Development Program) to improve the cyber situational awareness and response capabilities of the public and private sectors. In addition, the IPA, which has the strength as an information hub for the public and private sectors, will significantly strengthen its function to consolidate and analyze cyber situations including geopolitical information in an integrated manner, and enhance its response support function.

(AI Governance)

- The AI Safety Institute will take the lead in developing safety standards, etc., through international collaboration, while discussing the state of the rules.

【Digital Human Resource Infrastructure】

- Realize the government-wide target of fostering 2.3 million human resources for digital promotion and develop human resources for the utilization of generated AI.
- Expand the scale of fostering "MITOU Project" and horizontally expand them to local regions and other organizations.
- Aim to realize an ecosystem for the development of digital skills by establishing a platform that enables the management of information on the digital skills of human resources, upskilling, and skill assessment through examinations[79].
- Conduct a fundamental review of the Information Technology Engineer Examination since its inception in response to in the age of DX/Generative AI (examination categories, questions, etc.), and implement DX in examination administration in anticipation of a further increase in the number of examinees.

(Semiconductor Human Resources)

- Develop professional global human resources for semiconductor design and manufacturing.
- Concretize international cooperation on the promotion of semiconductor human resource development.

[79] See Reference Materials P44

(Battery Human Resources)

- Regarding the battery human resource development that is being promoted mainly in the Kansai region, consider expanding the target audience, enhancing the program content, and expanding the program nationwide.

【Web3.0】

- Through the advisory board and workshops to be held as part of the FY2023 Demonstration Project for the Construction of Digital Public Goods Utilizing Web 3.0 and Blockchain, the project will compile a strategy and roadmap for policies related to use case creation, technology development, human resource development, globalization, and other areas.

(3) Globalization and Realization of Economic Security

① Long-term goals for the foreseeable future

- Formulate rules in a manner that benefits Japan, ensure free trade and economic security, strengthen earning power, build win-win relationships with other countries, and achieve the target of 100 trillion yen in inward FDI in Japan by 2030 at an earliest date.
- Improve autonomy, secure superiority, and indispensability, and maintain a rules-based international order.

② Progress since second report of the committee

【Formulate external economic policies to ensure a free and fair international order and economic security】

- G7 Leaders' Statement on Economic Resilience and Economic Security…We will take a cooperative approach and discuss the contents adopted as the G7 Leaders' Statement below, not only with countries within the G7, but also with countries outside the G7.
  - Promote international rules and norms to promote facilitate trade and promote economic resilience based on a rules-based multilateral trading system with the World Trade Organization (WTO) at its core.
  - To strengthen joint assessment, preparedness, deterrence, and response to economic coercion, we launched a "the Coordination Platform on Economic Coercion " to strengthen coordination and further promote cooperation with non-G7 partners.
- Maintaining a rules-based international trade order (WTO reform) …Efforts were made to formulate rules in response to the demands of the times (e.g., e-commerce, subsidies, etc.) and toward restoration of the dispute settlement function where final decisions can be made.
- Building resilient and sustainable supply chains with like-minded countries…Discussed with like-minded countries policy coordination to ensure resilient and sustainable supply chains and markets to correct excessive dependence on some countries. In addition, based on the agreement at the G7 Hiroshima Summit on the "Principles on Resilient and Reliable Supply Chains," specific initiatives for further supply chain resilience were promoted in cooperation with the private sector.
- Efforts to strengthen partnerships with the Global South…We have been working to strengthen partnerships with countries in the so-called Global South by utilizing international forums such as the G20, EPAs, IPEF, QUAD and other frameworks, and dialogues with ASEAN, other Asian and African countries, etc. We aim to solve social issues faced by countries in the so-called Global South by leveraging Japan's strengths in technology and other areas.
- In addition to the above, we will flexibly determine which venues can be effectively utilized within the various frameworks of a multi-pronged buy-back, taking into account national interests, and will actively engage in international discussions.

【Export Promotion】

- Full-fledged promotion of DX for trade procedures…In 2023, in order to expand the number of trade platforms to be connected domestically and internationally, introduction of subsidies to promote the use of trade platforms and study groups to discuss the significance and issues of trade DX among businesses involved in trade In 2023, we started a study group to discuss the significance and

issues of trade DX among businesses involved in trade. In addition, we have been encouraged the revision of international standards for data models related to trade finance, etc. In addition, while utilizing the occasion of the 50th anniversary of ASEAN-Japan Friendship and Cooperation, a roadmap for the digitalization of trade in ASEAN and other countries will be formulated. Through these efforts, we are promoting the realization of cost reduction in trade procedures.

- Improvement of the export environment... NEXI established the "SEED Scheme" to improve the export environment by using NEXI's loan insurance as a lever to require foreign companies seeking assistance to actively engage in the creation and expansion of future transactions with Japanese companies. 2023 is the first year for the scheme, the first support project based on this scheme was launched.
- Enhancement of earning power of SMEs...Promotion and strengthening of the 10,000 new exporters support program for inexperienced exporters and other companies. Support was provided with the aim of fostering export support businesses by the private sector and establishing a mechanism for autonomous expansion of overseas business by small and medium-sized enterprises (SMEs).

【Overseas Investment and Expansion】

- Capturing the Global South Market...Launched the Meeting to Promote Cooperation with Global South Countries at the Prime Minister's Office. In addition to strengthening economic partnerships with countries of the Global South, METI also has started feasibility studies and other activities to support the formation of flagship projects that co-create future industries that will contribute to the advancement of Japan's industrial structure. In addition, we are also in the process of formulating regional strategies.
- Strengthen support for financing...NEXI has been working on the creation of support tools such as supply chain strengthening, GX, and overseas expansion support for start-ups through NEXI's loan insurance, etc. In addition, through strengthening cooperation with ECAs in other like-minded countries, NEXI has been working on the development of an environment for financing support for third-country projects that contribute to GX, etc., and has also confirmed cooperation with JICA. the JICA and the ECA also confirmed their collaboration to develop a blended finance-type support scheme that mobilizes public and private funds.
- Support for business demonstration through collaboration with local partner companies in India, Africa, and other regions where Japanese companies have not yet advanced...In FY2023, 9 companies will be supported to promote business creation.
- Fostering industrial human resources in India...Through the initiatives of the "Japanese-Style Monozukuri School (JIM)" and "Endowed Course (JEC)," develop industrial human resources to help Japanese companies in India secure human resources. 20,000 people in the manufacturing and digital fields have been trained from 2017 to 2023. The project has trained approximately 20,000 people in the manufacturing and digital fields between 2017 and 2023.
- Fostering industrial human resources in Africa...Provide education and training opportunities for African human resources under the AfIF (Africa's Future Industrial Human Resources Initiative) launched at TICAD 8 in 2022. 2023: Fostered approximately 3,000 people.

- Fostering human resources for zero-emission in Asia and other regions...Support for fostering human resources who can contribute to promoting energy conservation and carbon neutrality at local production bases.
- Support for local human resource development overseas...Supports human resource development by subsidizing the cost of training conducted by receiving overseas human resources to Japan, training conducted locally overseas or in third countries, online training, dispatching experts, etc. In FY2023, more than 3,800 people will be supported for human resource development. In addition, the program subsidizes the costs for Japanese companies to establish endowed courses at local universities and other educational institutions, etc. In FY2023, the program will support the development of approximately 1,700 human resources.

【Trade in Services Promotion, etc.】

- Creating inbound demand...Inbound is the second largest means of acquiring foreign currency before the COVID-19. In Japan, where the domestic market is shrinking, the creation of inbound demand in the coming era will be strategically implemented based on the "Action Plan for Expanding Inbound Demand in the New Era" newly established for the entire government, etc. The creation of inbound demand in the coming era is a top-priority issue. In particular, it is important to pursue quality rather than quantity in order to improve productivity while avoiding over tourism, which could lead to excessive burden and exhaustion on local communities, and to achieve high added value through design and art investments that bring out the individuality of the region. Furthermore, from the viewpoint of equalizing inbound demand not only to famous tourist destinations but also to every corner of the country, it is important to focus on the needs of business travelers who can be attracted to Japan and stay longer even if there are no world-famous tourist resources, and to create a new business inbound market in cooperation with local governments across the country. (Aiming to create an unprecedented new business inbound market in cooperation with local governments across Japan.
- Prevention of the spread of product accidents in the online market...Establish a system to ensure that measures are taken to prevent the spread of product accidents, mainly for products sold by overseas operators in the online market. In addition, the market for toys and other children's products will be expanded to ensure their safety and allow consumers to trade them with peace of mind.

【Foreign Direct Investment in Japan】

- Promotion of Acceptance of Highly Skilled Foreign Human Resources...A study group for highly skilled foreign human resources will be held by industry, academia, and government from October 2023 to share corporate initiatives and comprehensively discuss public and private sector issues, including institutional aspects. 24 face-to-face or online job fairs in 10 countries in Asia, Central and Eastern Europe, and Mexico in FY2023. In FY2023, 24 face-to-face and online job fairs were held in 10 countries in Asia, Central and Eastern Europe, and Mexico. In addition, in FY2022 and 2023, regional consortiums for the active participation of highly skilled foreign human resources were launched in six regions in Japan (Hokkaido, Tohoku, Hokuriku, Kansai, Chugoku, and Kyushu). Going forward, the consortium aims to promote the overseas expansion of small and medium-sized

enterprises and revitalize regional economies by promoting the activities of high-level foreign human resources. In addition, an internship program was conducted to promote the development of a system for Japanese companies to accept foreign human resources, and 105 foreign human resources were accepted by 93 small and midsize companies across the country.

- Promote investment in key sectors and local communities...In April 2023, the "Action Plan for Attracting Human and Financial Resources from Overseas" was compiled, including the promotion of investment in strategic sectors such as semiconductors.
- Support for business feasibility studies in collaboration with Japanese companies, attract foreign companies and follow-on investment in the region... A "Follow-up Council for Regional Investment Promotion" was newly established to discuss measures to attract foreign companies to the region and follow-up measures for the establishment of foreign companies and follow-on investment. The meetings were held in Fukuoka, Osaka, and Hokkaido during FY2023. Publicly solicited for subsidies for business feasibility studies for new investment in Japan by overseas companies and adopted 11 cases.
- Strengthen networking between foreign and Japanese startup ecosystems...Held pitch events in Boston, London, and Singapore during FY2023 to strengthen networks with local ecosystem stakeholders. In addition, in FY2023 (as of the end of December), 17 foreign corporate executives were invited to meet with local companies and local governments in Japan to attract foreign companies to Japan.
- Strengthen matching between foreign and Japanese companies...Through JETRO's business platform "J-Bridge," 13 collaborative partnerships between foreign and Japanese companies were created in FY2023 (as of the end of December).
- Promote inbound M&A in Japan and collaboration with foreign companies...In April 2023, a "Case Studies relating to the Use of Inbound M&A Transactions" was compiled and publicized through lectures, etc. Since December 2023, the "Study Group for Collaboration and Joint Venture Cases Between Japanese and Foreign Companies" has been held, and in April 2024, the "Case Studies relating to Collaborations and Joint Ventures between Japanese and Foreign Companies in Japan" was published, focusing on forms of collaboration in addition to M&A in Japan, and summarizing their effects and significance.
- Improve Japan's business environment...The "Meeting with the G7 Members' Chambers of Commerce in Japan" was held four times during FY2023 to discuss issues related to Japan's business environment. English translations of 17 laws and regulations under the jurisdiction of METI, particularly those related to the promotion of inward FDI in Japan, were in progress in FY2023. The AI translation system for laws and regulations introduced by the Ministry of Justice in December 2023 is scheduled to be operational for all ministries and agencies from FY2024.
- Information dissemination...JETRO's Invest Japan Business Support Center (IBSC) provides consultation services and information on establishing a base in Japan in multiple languages (Japanese, English, Chinese, and Taiwanese). In addition, public relations activities such as advertisement articles were published in major economic newspapers overseas (Canada, Germany, Spain, France, etc.).

【Ensuring technological superiority】

- Foster advanced critical technologies through the execution of the Fund for Fostering Critical Technologies for Economic Security…A designated fund council will be established and convened under the Economic Security Promotion Act to implement the "Key and Advanced Technology R&D through Cross Community Collaboration Program (commonly known as the K Program)", which promotes research and development of advanced critical technologies.
- So far, 50 critical technologies to be supported by the K Program have been identified and R&D has been started sequentially through a public call for applications procedure.

【Supply chain resiliency】

- Ongoing review of specific critical commodities…In January 2024, we decided to add advanced electronic components to the list of Specified Critical Goods. Continuous review on specified critical commodities was conducted.
- Established a fund to support private-sector businesses' efforts such as capital investment to secure domestic production infrastructure to ensure stable supply. Based on the Economic Security Promotion Act, in the supplementary budget for FY2023, the government supported the efforts of private enterprises to make capital investments to secure domestic production bases to ensure stable supply.
- Based on the Law for the Economic Security Promotion Act, preparations are being made for the introduction in May 2024 of an advance screening system for the introduction of equipment for key infrastructure.

【Dialogue with Industry and International Cooperation】

- Exchange views with industry on threat and risk analysis, supply chain resilience of critical goods, etc.
- Activate dialogue on economic security with like-mindeds countries (utilize international platforms such as G7)

【Enhancing Economic Intelligence (threat and risk analysis)】

- Legislation of "Security Clearance System" which is a strict management rule such as only those who need access to information designated as important for security held by the government and whose credibility is confirmed through government investigations are allowed to handle the information.

③ Measures that need to be considered in the future

【Formulate a foreign economic policy that balances a free and fair international order with economic security】

- Maintaining a rule-based international order.
- Strategically promote cooperation in industrial policy with like-minded countries, such as the U.S. and Europe, to create demand for products that take for example "sustainability" into account and ensure resilient and sustainable supply chains and markets. We will also aim for cooperation with

the Global South through international frameworks such as AZEC and various policies for the Global South.

- Through the meeting to Promote Cooperation with Global South Countries, we will compile a policy for partnerships with the countries of the Global South by this spring. Furthermore, in order to strengthen economic partnerships with the Global South, a framework will be established to develop third-country partnerships in the Middle East, Africa, etc. in an areal manner with India, and starting from this framework, strategic initiatives in specific priority areas and countries will be developed as a package, including infrastructure construction and financing enhancement (NEXI function enhancement, etc. will be considered). The framework will be used as a starting point for strategic initiatives in selected priority areas and countries.
- Recognizing the importance of EPAs to strengthen supply chains through enhanced trade and investment relations and as a countermeasure against protectionism, promote EPA negotiations with emerging countries (GCC, Turkey, Bangladesh, etc.) and investment agreement negotiations with African, South American, Central Asian countries, etc., and steadily implement agreements already in force. Steadily implement agreements that have already entered into force.
- In addition, we will promote cooperation in the areas of supply chain and clean economy through the IPEF framework, general review of the CPTPP, and transparent implementation of the RCEP agreement.

【Export promotion】

- Promotion of digitization of trade procedures...Establish an environment for digitization of trade procedures in ASEAN and other countries (support efforts of each country to realize the roadmap established in FY2023), including formulation of action plans in cooperation with other ministries and agencies.
- Improving the Export Environment with NEXI Loan Insurance.
- Enhancement of "earning power" of SMEs, etc... Promotion and strengthening of the 10,000 New Exporters Support Program (from FY2022), targeting companies with no export experience, etc. Promote initiatives aimed at building a mechanism for autonomous expansion of overseas business by small and medium-sized enterprises (SMEs) by fostering export support businesses by private businesses, including regional trading companies.

【Overseas Investment and Expansion】

- To strengthen economic partnerships with the Global South, a framework will be established to develop third-country partnerships in the Middle East, Africa, etc. in an areal manner with India, and, starting from this framework, strategic initiatives in priority areas and countries will be developed as a package, including infrastructure construction and financing enhancement (NEXI function enhancement will be considered).
- Strengthen support for new business exploration...Support for cutting-edge companies, including start-ups, creating matching opportunities with local companies; support for international rule formation and project formation in green and digital fields, etc., in conjunction with IPEF and other economic partnership frameworks.

- Strengthening of financing support...In order to support the global challenges of companies through the trade insurance system even in the midst of a drastically changing international economic environment, both risk management and financial foundations will be strengthened. In doing so, especially in areas of high policy significance, including supply chain resilience, GX, and international collaboration, the government can provide focused insurance to support the challenges of companies.
- Strengthen support for local business entry and expansion, formulate external economic strategies, and enhance support implementation systems.
- Support for expansion into regions where Japanese companies are relatively under-represented, human resource development to meet new industrial human resource needs, and strengthening of local human network building for co-creation business formation...Support for expansion into India and Africa, support for human resource development in green and digital fields, support for institutional development of local regulations and standards, and support for network building with overseas human resources, universities, and other organizations. Support for human resource development in green and digital fields, support for institutional development of local regulations and standards, support for network building with overseas human resources and universities, etc.

【Trade in Services Promotion, etc.】

- Supporting companies aiming to become global leaders in manufacturing, healthcare, agriculture, and other fields by combining digital technology to scale.
- Preventing the spread of product accidents in the online market...Establish a system to ensure that measures are taken to prevent the spread of product accidents for products sold by overseas operators in the online market.

【Foreign Direct Investment in Japan】

- Strengthen efforts to attract FDI projects in Japan that contribute to innovation and regional revitalization, promote collaborative partnerships with overseas companies, and provide accompanying support to regions that attract such projects.
- Steadily implement the "Action Plan for Attracting Human and Financial Resources from Abroad".
- Active utilization of highly skilled foreign human resources...Comprehensively organize public and private sector issues for the active utilization of highly skilled foreign human resources. Promote recruitment through strengthening cooperation among universities, companies, economic organizations, and other related parties in the region, as well as promote the internationalization of small and medium-sized enterprises and foster a shared understanding of issues related to the working environment and promote regional solutions. In addition, the project will foster a shared understanding of issues related to the working environment and promote local efforts to resolve them. In addition, JETRO's expert consultants will provide support for companies in resolving issues, improving the working environment, and assisting with procedures, etc., in the process of recruiting and retaining highly skilled foreign human resources. Enhance the provision of information on working in Japan on the portal site for promoting the activities of highly skilled foreign human resources.

- Diversification of human resources acquisition through provision of information on university and graduate school graduates from the Global South, expansion of endowed courses, promotion of acceptance of IT human resources as interns, etc.
- Promote collaboration between Japanese and foreign companies…Verify the effectiveness of inbound M&A in Japan and collaborations between Japanese and foreign companies, disseminate the results, and support the establishment of an internal corporate structure for cross-border collaborations.
- Strengthen information dissemination by national and local governments in English…Support for outward PR by local governments, etc. working to promote inward FDI, and shorten the period for translating laws and regulations into English, etc.
- Strengthen efforts to attract inward FDI in cooperation with national and regional stakeholders…In order to attract foreign companies with specific technologies to invest in specific areas in Japan in important fields, METI will conduct quantitative and qualitative comparative analysis about factors affecting the location of companies and industrial infrastructures at industrial bases in Japan and overseas. Based on the results, the national and regional stakeholders will work together to enhance the infrastructure of industrial bases in each region and attract promising foreign companies (including follow-on investment).
- Stimulate inward FDI in Japan and accelerate the investment consideration process… Specialists in attracting inward FDI in Japan will be assigned in countries around the world to visit promising foreign companies individually. In addition, to encourage investment decisions, programs to invite foreign corporate executives, support for business feasibility studies and others will be implemented.
- Strengthen networking between foreign and Japanese startup ecosystems…Strengthen networking with local ecosystem stakeholders in foreign countries, including foreign investors, through pitch events and networking events for promising startups in Japan and foreign countries.
- Improve Japan's business environment…Work with "Meeting with the G7 Members' Chambers of Commerce in Japan," as well as with foreign government agencies, economic organizations, companies, investors, and others to understand the issues in the Japan's business environment and take necessary actions.

【Securing technological superiority】

- In order to maintain and develop Japan's industrial and technological base, we will establish a system for threat and risk analysis, provide investment support to acquire technological advantages, strengthen technology management measures including a framework in new trade controls, and strategically collaborate with industry and major countries.
- Invest in building supply chains and innovation to ensure technological superiority, while preventing the outflow and proliferation of sensitive technologies.
- Establishment and holding of the Designated Fund Council under the Economic Security Promotion Act and continued implementation of the "Key and Advanced Technology R&D through Cross Community Collaboration Program (K Program)", which promotes research and development of advanced critical technologies.

【Supply Chain Resiliency】

- Aim to ensure indispensability and restore pluralism and autonomy of supply through efforts related to specific critical commodities based on the Economic Security Promotion Act and other measures.

【Dialogue and international collaboration with industry】

- Continue to exchange views with industry on threat and risk analysis, supply chain resilience of critical commodities, etc.
- Activate dialogue on economic security with like-minded countries (use of international platforms such as G7)

【Enhanced intelligence capabilities (threat and risk analysis)】

- In order to analyze threats and risks to Japan's industrial and technological infrastructure and their impact, we will conduct scenario analysis (analysis of the impact and countermeasures in the event of the occurrence of specific threats and risks), supply chain analysis (identification of goods and technologies that could become choke points in the supply chain with significant impact in the event of supply disruptions), and technology analysis (identification of Japan's technological advantages).
- Share information with relevant companies, utilizing the security clearance system as necessary.

(4) Realization of a new healthy society

① Long-term goals for the foreseeable future

- Achieve healthy life expectancy of 75 years or more by 2040.
- Realize 77 trillion yen in public uninsured services in 2050.
- Realize acquisition of 21 trillion yen of the global medical equipment market and 25-30 trillion yen of the global pharmaceutical market.

② Progress since second report of the committee

【Promotion of PHR, promotion of healthcare startups】

- Promoting entry into other fields through promotion of PHR...
  - Promotion of utilization of public health medical data (promotion of Mynaportal API linkage, revision of basic guidelines)
    (In 2021, MIC, MHLW, and METI will formulate the "Basic Guidelines" for handling information on health examinations, etc.; private PHR providers will obtain information from public institutions via Mynaportal with the consent of the individual; information on medical bills in 2021, cancer examinations in 2022, etc. will be provided sequentially; the "Basic Guidelines" is scheduled to be revised along with the provision of electronic medical record in the fall of 2024.
  - Develop business environment (standardization of lifelog data, etc., and formulation of industry guidelines for appropriate data management and service provision) in collaboration with cross-industry organization (PHR Service Business Association: to be established in July 2023)
  - Conduct demonstration projects to create new use cases where the public can feel the value of using PHR and promote public awareness of PHR using opportunities such as the Expo 2025 Osaka, Kansai, Japan.
- Promoting investment in health by companies and society through KENKO Investment for Health...
  - Establishment of a mechanism (e.g., promotion of information disclosure) to ensure that KENKO Investment for Health management is evaluated by various stakeholders in the capital and labor markets (institutional investors, job seekers, etc.)
  - Development of incentives such as subsidies for SMEs and preferential treatment in policy finance
  - Visualization and analysis of the effects for high quality KENKO Investment for Health
  - Establishment of a platform for companies practicing KENKO Investment for Health to select KENKO Investment for Health support services, including KENKO Investment for Health consulting and mental health support.
  - Smooth privatization of KENKO Investment for Health system operation
  - International expansion and incorporation into global evaluation indices
  - Organizing conferences to build a network among local governments promoting KENKO Investment for Health.
- Strengthening of community functions centered on regional centers to strengthen the healthcare startup ecosystem, overseas dispatch programs in collaboration with overseas medical institutions and accelerators, etc., and global conferences inviting people involved in healthcare startups in Japan and overseas.

【Promotion of services outside the public insurance system, promotion of balancing work and nursing care】

- Establishment of guidelines, certification systems, etc. in cooperation with industry associations, academia, etc. to ensure the reliability of healthcare services.
- Promotion of initiatives in the nursing care sector in the community and work areas to counter business carers...
  - Estimation and presentation of economic losses due to caregiver turnover, etc. of business caregivers without public insurance in the long-term care sector (9 trillion yen in 2030)
  - Continuation of companion support for the purpose of matching municipalities and private businesses, implementation of model projects for cooperation between prefectures and municipalities, strengthening of channels for services outside the long-term care insurance in local communities and job areas, and securing of reliability for the development of various receptacles for demand for long-term care (promotion of services outside the long-term care insurance). Support for the establishment of industry associations and the development of certification systems for uninsured services to ensure credibility.
  - To promote support for balancing nursing care and work in companies, a "Study Group on Corporate Management and Support for Balancing Nursing Care and Work" was held and guidelines were established for efforts to support balancing nursing care and work in companies. Based on this guideline, collaborate with the management community, and implement measures to support balancing work and family care in small and medium-sized enterprises with limited resources.
  - Promote consideration of reviewing priority areas for nursing care robot development and promote acquisition of certification, etc. to capture overseas markets.

【Development and overseas expansion of advanced medical devices/pharmaceuticals】

- Provide support for the development environment and research and development of SaMD that create new value. Jointly developed and published "DASH for SaMD2", a packaged strategy to promote practical application of SaMD, with the Ministry of Economy, Trade, and Industry (METI) and the Ministry of Health, Labor, and Welfare (MHLW).
- To promote the international expansion strategy, support for expansion into Asia based on the MExx concept, collaboration with strategic priority regions in Africa, and expansion of the medical inbound market (development of the Vietnamese market and appeal to the needs of medical checkups), etc.
- Through the Japan Agency for Medical Research and Development (AMED), support the practical development of innovative pharmaceuticals by Pharmaceutical Startups in which registered venture capitals invest.

③ Measures that need to be considered in the future

【Promotion of PHR, promotion of healthcare startups, etc.】

- To promote the industrialization of healthcare (health, medical care, and nursing care), which has great potential amid the aging of Japan's population, the government will develop PHR, etc., which will serve as the foundation for the industry, create new businesses by supporting accompanying

healthcare startups, and establish a mechanism to promote nursing care businesses that meet regional characteristics. The construction of a system to promote nursing care business according to regional characteristics will be promoted.

- Demonstration of information collaboration infrastructure and creation of use cases using the opportunities provided by Expo 2025 Osaka, Kansai, Japan.
- Increase the number of businesses that link to Myna Portal API to create use cases that acquire and utilize information on health checkups, etc.
- Improvement of business environment through implementation of demonstration projects and revision of "basic guidelines" in line with the current situation to further increase the number of uses cases.
- Promote the creation of new services through cross-industrial collaboration by spreading awareness of the value of PHRs in cooperation with private business associations.
- Improvement of the environment for KENKO Investment for Health as a foundation for supporting the Japanese economy and society
- Visualization and quality improvement of KENKO Investment for Health by analyzing the effects of KENKO Investment for Health and examining appropriate indicators...
- Creation of new markets by creating industries that support KENKO Investment for Health and promoting international expansion.
- Penetration and establishment of KENKO Investment for Health t in society by expanding its diffusion to small and medium-sized enterprises and complete privatization of the system.

【Promotion of services outside the public insurance system, promotion of balancing work and nursing care, etc.】

- Matching support with local resources provided by private companies, etc. for entities responsible for care and welfare in the community...
  - Building a model in cooperation with prefectures, etc., for a mechanism to link the services of companies, etc., which develop their activities in a wide area, to municipalities.
  - Demonstration of incentive design for referral of welfare professionals to services and establishment of specialized contact points in job areas.
  - Support for the establishment of a certification system by industry associations as a mechanism to ensure the reliability of services outside of long-term care insurance.
  - As part of reaching out to corporate management, share knowledge and promote the need for support for balancing work and nursing care to management in cooperation with activities related to human capital management and economic organizations, etc.
  - Study and implement measures based on the results of the demonstration, and promote further enhancement of local resources by the private sector, etc.
  - Operate a certification system for services not covered by public insurance, make organizations self-supporting, and promote the spread of uninsured services.
  - Continue to promote awareness-raising activities while reflecting revisions in guidelines, etc., as necessary.
- Establish a mechanism to support SMEs in terms of balancing work and family life as a region in cooperation with local governments and support groups, etc.

- Support development of nursing care robots based on priority fields and promote acquisition of certification to capture overseas markets.
- Improvement of the environment for KENKO Investment for Health as a foundation to support the Japanese economy and society.
- Visualization and quality improvement of KENKO Investment for Health by analyzing the effects of KENKO Investment for Health and examining appropriate indicators…
  - Creation of new markets by creating industries that support KENKO Investment for Health and promoting international expansion.
  - Penetration and establishment of KENKO Investment for Health in society through expansion of the system to small and medium-sized enterprises and full privatization of the system

【Development and overseas expansion of advanced medical devices/pharmaceuticals】

- Regarding the bio industry, consider how to support the development and enhancement of contract development and manufacturing bases in the fields of biopharmaceuticals and regenerative, cellular, and gene therapy.
- Strengthen collaboration with other ministries and agencies' projects to support the growth of pharmaceutical and medical device startups on a government-wide basis.
- Support for intensive R&D investment in new competitive areas that capture unmet needs (latent needs), building evidence for clinical trials, etc. necessary for deployment to the U.S. to establish international competitiveness, and building the networks necessary for deployment.
- Support for research and development and demonstration to build evidence on clinical usefulness and economic efficiency for social implementation of SaMD such as AI diagnostics.

(5)Inclusive growth in the region that contributes to coping with a declining birthrate

① Long-term goals for the foreseeable future

- Through the creation of quality jobs and a well-being living environment (increase in disposable income and time) through the growth of local businesses, etc., the desired fertility rate of 1.8 will be restored, and an economic environment will be realized in which the desired level of demographic stability can be achieved further.

② Progress since second report of the committee

【Creation of quality jobs (Industrial policies that lead to "increased disposable income" through increased incomes for young people and women)】

(Growth of core businesses in the region)

- Intensive support for small- and medium-sized enterprises that drive the local economy (e.g., building a network of managers and a support system of experts for new business development) ...
  - Establishment of a quota for medium-sized enterprises in the tax credit for promoting investment in the regional future
  - Establishment of subsidies for large-scale growth investments, such as labor-saving investments, etc., to raise wages of small- and medium-sized enterprises.
  - Renewal of Companies Driving Regional Growth (FY2025)
- Support for Wage increases for small and medium-sized enterprises (SMEs) in conjunction with business restructuring, productivity improvement, and other related measures...Establishment of a five-year carry-over credit measure in the wage increase promotion taxation system for SMEs.
- Creation of growth-oriented small and medium-sized enterprises (promotion of transformation using succession within the family and third-party succession including M&A, innovation support, enhancement of internal resources such as human and financial resources, and accompaniment support) ...
  - "Guidelines for Small and Medium-Sized M&A (Second Edition)" published.
  - Extension of the deadline for submission of special succession plans under the business succession taxation system by two years.
  - In addition to the establishment of a tax system[81] to encourage multiple M&A for grouping of small and midsize companies with growth potential, the establishment of the "SME Grouping and Business Restructuring Support Fund Investment Program" and the expansion of the "Business Succession, Consolidation and Activation Support Fund" by the Japan Finance Corporation to promote the grouping of small and midsize companies, etc. Support Funds for Business Succession, Consolidation, and Revitalization" by Japan Finance Corporation.
- Infrastructure development for industrial location (development of industrial infrastructure such as industrial water supply for important industries, facilitation of land use adjustment, etc.) ...
  - New grants have been established to provide flexible and additional support for the development of related infrastructure such as industrial water when developing production bases for national projects related to strategic sectors.

[81] See Reference Materials P95

  - Relaxation of development permit procedures in urbanization control areas for industrial use that contributes to regional economic development to speed up land use conversion when locating industries.
  - Shortening the time required for land use conversion procedures through cooperation among city planning departments and agriculture, forestry, and fisheries departments of local governments, utilizing the Act for Promotion of Future Regional Investment.
- Measures to pass on prices, including labor costs, and declaration of partnership building... Based on the month of promoting price negotiation, a list of companies that organized the status of price negotiation and shifting from the viewpoint of subcontracting SMEs was published. Provided guidance and advice to the top management of companies placing orders whose evaluation was not favorable.
- Establish an ecosystem to promote projects that aim to solve social issues in the region by utilizing impact investment and financing, etc....Publication of "Basic Guidelines for the Promotion of Businesses for Solving Regional Issues" to create and foster Zebra companies.
- Promote financing practices that do not rely on management guarantees...
  - Establishment of a new credit guarantee framework which allows additional credit guarantee fee instead of providing a management guarantee (SME Credit Insurance Law revised)
  - Reduction of the additional credit guarantee fee as a temporary measure (three years) to promote the use of the new framework
- Support for women entrepreneurs in the region

(Establish a vision for the economy and industry of the entire region and an ecosystem in which funds and human resources circulate)

- Promote investment in tourism and other sectors through the use of art, design, sports, and other activities that take advantage of local resources.
- Publication of the "In-town Designer Utilization Guide" as a guideline for local governments and others to utilize design.
- Publication of "xART Startup Guidelines," a set of guidelines for communities to engage in public art.
- Strengthening efforts in the field of design that contributes to the high added value of Japanese industry.
- Supporting overseas development of sports content by Japanese sports leagues and teams.

【Creation of quality jobs (reform of work styles and regulations that lead to "more disposable time" for young people and women)】

- Improvement of local work environments through the promotion of diversity management and selection of best practices...
  - Organizing good practices of diversity management in the region
  - Horizontal development of good practices in the region
- Introduction of WLB scoring during grant review... In principle, implement point-approval measures for companies that support childcare and promote women's activities, while taking into account the purpose of the subsidy.

- Promotion of diverse work styles regardless of gender by utilizing the Nadeshiko brands...In FY2023, we newly selected "Next Nadeshiko: Companies Supporting Dual-career and Co-parenting" (March 2024).
- Support for recruitment, training, and retention of human resources for multiple local companies; METI supports the demonstration projects of "regional human resources departments" that work together with local governments, financial institutions, and other related organizations to secure future managers and executive candidates for local companies and to establish career paths within the region (40 projects over 2 years).
- Introduction of Femtech and other companies to solve women's health issues... Support for demonstration projects (57 cases over 3 years) to solve women-specific health issues by utilizing Femtech, etc. and to ensure continuity of employment, etc., and to understand and disseminate the effects of the demonstrations.
- Promotion of the use of housekeeping services...Conduct demonstration projects to provide employees of small and medium-sized enterprises (SMEs) with opportunities to use housekeeping services through employee welfare programs.

【Creation of a prosperous living environment (Efforts to improve the environment surrounding marriage, child rearing, and the lives of young people and women)】

- Realization of an educational environment that responds to diverse needs
- Sustainability of infrastructure for daily life such as transportation and logistics through the use of digital technology
- Nationwide development of successful examples of businesses that solve social issues...Publication of "Basic Guidelines for the Promotion of Businesses that Solve Local Issues," including examples from Zebra Enterprises
- Matching support for men and women to get married with an eye to rural areas...Demonstration for building an environment to introduce services such as life design services that contribute to career development in companies, etc.

③ Measures to be considered in the future

【Creation of quality jobs (Industrial policies that lead to "increased disposable income" through increased incomes for young people and women)】

(Growth of core businesses in the region)

- Nurture core regional companies (small and medium-sized enterprises that have a large impact on the regional economy, are expected to have growth potential, and are central players in the regional economic value chain) that can realize quality employment through wage increases and work style reforms, in cooperation with local governments, and put them on a further growth trajectory. The goal is to put them on a further growth trajectory.
- Consider measures to strengthen the enforcement of the Act against Delay in Payment of Subcontract Proceeds to Subcontractors (e.g., through cooperation with the JFTC and ministries and agencies with business jurisdiction) and to strengthen price shifting by thoroughly shifting labor and other costs in public sector demand.
- Work to further expand and improve the effectiveness of the Partnership Building Declaration.

- To promote the creative industry, promote strategic overseas expansion using overseas local bases, etc., support to realize international standard production, support contract negotiations with platformers, etc., and foster creators. Through these efforts, we will also enhance the earning power of tourism and inbound tourism by creating high value-added in other industries.
- Promote business restructuring, productivity improvement, etc. in small and medium-sized enterprises (SMEs) and wage increases that are integrated with related measures.
- Creation of growth-oriented SMEs (M&A and grouping, innovation support, enhancement of internal resources such as human and financial resources, accompaniment support, and promotion of capital investment)
- Support for successors, PMI support, and improvement of the M&A market environment to promote transformation using intra-family succession and third-party succession, including M&A, as opportunities.
- Creation of female entrepreneurs as role models, support for their development and building regional networks to support female entrepreneurs.
- Promote growth of small and medium-sized enterprises as the core of the regional economy, including exports to overseas, and further spillover to the regional economy through intra-regional transactions, etc.
- Strengthen support to create more medium-sized and small enterprises, which drive the regional economy, by raising productivity through new business development, labor-saving and other initiatives, raising wages to levels comparable to those in the Tokyo area, and vigorously reforming work styles, etc.
- Vigorously work to create "quality jobs" in small and medium-sized enterprises by raising wages, strengthening investment in human resource development, and reforming work styles to enable the flexible work styles demanded by the younger generation, as well as promote recognition and brand power of Companies Driving Regional Growth.
- Utilizing the Act for Promotion of Future Regional Investment, promote the efforts of local governments that are willing to strategically take industrial policies that take advantage of their respective regional characteristics, such as industrial clusters and industrial infrastructure, in order to maximize results, taking into account environmental changes such as GX, while resources, such as human resources, are limited.
- In regions where large-scale investments are occurring, maximize the ripple effects on the local economy by working more closely with local governments to solve regional issues, including infrastructure and human resources, and by creating "quality jobs" throughout the regional supply chain.
- While promoting industrial policies tailored to regional characteristics, many municipalities face challenges in developing industrial infrastructure, such as the shortage of industrial sites and the emerging demand for new industrial water in some municipalities. Therefore, the project will promote the effective use and development of industrial sites, the acquisition of know-how, and the effective use and development of industrial water supply systems, based on medium- and long-term demand from companies and regional industrial policies.

- For a sustainable supply of low-cost and stable industrial water, drastically improve the management structure by introducing water PPPs, digitalization, and higher profitability, and promote measures to cope with the aging of industrial water supply facilities and their resilience.
- Promote further responses to supply constraints such as labor shortages, including promotion of the use of AI and robots.

(Establish a vision for the economy and industry of the entire region and an ecosystem in which funds and human resources circulate)

- To form a soft infrastructure and a network of support organizations across regions to supplement resources such as specialized human resources and large-scale funds to address management issues (e.g., M&A, DX, intellectual property, capital policy, etc.) that are becoming more sophisticated as companies expand in size, and to create an environment where companies can seamlessly grow from SMEs to medium-sized firms and then to large firms. In order to create an environment in which SMEs can aim for seamless growth from small and medium-sized enterprises to medium-sized enterprises and then to large enterprises, the future ideal of the ecosystem surrounding medium-sized enterprises, barriers to achieving this ideal, and items to be addressed by the public and private sectors will be identified and discussed.
- Increase productivity by realizing high value-added through design, art investment, inter-disciplinary collaboration, etc. that brings out the individuality of the region.
- Attract funds from abroad to domestic sports leagues/teams and contribute to the promotion of the tourism industry in the region.

【Creation of quality jobs (reform of work styles and regulations that lead to "more disposable time" for young people and women)】

- Encourage small and medium-sized enterprises rooted in the community to embrace diverse values and realize corporate management in which it is easy for everyone including women and young people to work.
- Support for working women to balance their health issues and life events with their careers through the use of Femtech, etc.
- Support the efforts of "regional human resource departments," in which core regional companies, such as the Companies Driving Regional Growth, promote work style reforms, and recruit and train local human resources in cooperation with local governments, management support organizations, educational institutions, and other related local organizations.

【Creation of a prosperous living environment (Efforts to improve the environment surrounding marriage, child rearing, and the lives of young people and women)】

- To respond to various issues corresponding to life stages of individuals, improve the quality of life, and contribute to the enhancement of corporate value, etc., we will develop an environment to introduce the following services to companies and other organizations. Housekeeping services that contribute to securing free time, supporting service for proactive life design, and internal and external community building, etc.

- In order to realize diverse learning in various regions, work with companies and individuals to create models that local communities support the education of the next generation, while also utilizing the vitality of private educational services and donations and support from companies, etc.
- Conduct local demonstrations of projects to solve local issues centered on Zebra companies, organize business models, and establish evaluation methods for social impact, etc.

(6) Realization of a resilient society against disasters

① Long-term goals for the foreseeable future

- Achieve the acquisition of the global market including the adaptation market in developing countries (about 70 trillion yen in 2050).

② Progress since second report of the committee

【Promote investment in corporate disaster prevention and resilience】

- Establish an environment for the promotion of smart industrial safety…In December 2023, the Ministry of Economy, Trade and Industry (METI), based on the provisions of the revised High Pressure Gas Safety Act, etc., implemented institutional measures under the Accredited Advanced Safety Inspectors System, including making voluntary safety initiatives using advanced technologies such as digital technology a mandatory requirement and simplifying administrative procedures for Accredited Advanced Safety Inspectors..
- Efforts to further promote of smart industrial safety…In February 2024, the High-Pressure Gas Safety Subcommittee of the Smart Industrial Safety Public-Private Council was convened. Follow-up on the action plans of the public and private sectors was conducted and progress on smart industrial safety was reviewed.

【Introduction of advanced disaster prevention and mitigation solutions in municipalities】

- Support for start-up in the resilience field…Conducted hearings on disaster reduction-related needs of municipalities and startup technologies, and formulated topics to be solicited in the SBIR. The project will start in May 2024 and is scheduled to begin this fall.

【Acquisition of overseas markets】

- International promotion of adaptation technologies…The number of good practices of Japanese companies' adaptation business in developing countries was expanded from 41 to 56 and was promoted to such as UN agencies and governments of developing countries. In addition, to promote understanding of these technologies, a total of five seminars were held for Asian Development Bank staff, and seminars were held at COP28 in cooperation with the African Development Bank, Asian Development Bank, and UN-HABITAT.
- Improving Disaster Preparedness in Developing Countries in Collaboration with UN Agencies…At COP27, METI and UN-HABITAT Regional Office for Asia and the Pacific announced the "SUBARU Initiative" which aims to improve urban resilience in the Asia-Pacific region together with Japanese companies. Under the Initiative, matching meeting between five cities in the Asia-Pacific region and six Japanese companies were held in September 2023, and one demonstration was conducted in Nepal in January 2024. In addition, efforts through the Initiative were agreed upon at the ASEAN-Japan Economic Ministerial Meeting in August 2023 as measures to be undertaken by ASEAN and Japan in the future.
- Holding of international workshops…A public-private workshop was held with Thailand in March 2024 to introduce effective technologies from Japanese companies for adaptation in the Thai agricultural sector, and to discuss future collaboration and other issues.

- Promoting mobilization of finance for adaptation projects…Through interviews with private financial institutions, etc., issues related to investment and financing were identified and measures necessary to mobilize private finance were discussed.

③ Measures that need to be considered in the future

【Promote investment in corporate disaster prevention and resilience】

- Efforts to further promote of smart industrial safety…Encourage smart industrial safety to business operators through public-private councils, etc. (Hold high-pressure gas safety subcommittee of the Smart Industrial Safety Public-Private Council to share issues, solutions, progress of action plans, etc. in promoting smart industrial safety.)

【Introduction of advanced disaster prevention and mitigation solutions in municipalities】

- Support for start-up in the resilience field…Specify the disaster prevention needs of local governments, investigate products and services of startups and others that can meet those needs, and set R&D topics from the perspective of minimizing damage and speeding recovery.
- Examine measures to create a domestic market…To create a resilience industry, the SBIR system will be linked to the expansion of the domestic market. In addition, study on the nature of public-private partnerships that contribute to disaster prevention (e.g., disaster supplies) will be conducted.

【Acquisition of overseas markets】

- Continue to support the deployment of products and services of Japanese companies to overseas markets in cooperation with the domestic market.
- International promotion of adaptation technologies…Expand the collection of good practices of Japanese companies' adaptation business and disseminate them outside Japan at international conferences for governments of developing countries, UN agencies, etc.
- Improve disaster preparedness of developing countries in collaboration with UN agencies…Hold matching meetings between local governments of developing countries and Japanese companies under the "SUBARU Initiative".
- Feasibility study (FS) surveys, institutional development, and demonstrations for overseas deployment…Identify institutional and technological issues related to response to climate disasters in developing countries, and conduct FS surveys and demonstrations of individual technologies, develop institutions through trainings etc., coordinate with local governments (at local/national level), and utilize international cooperation schemes to resolve these issues.
- Promote mobilization of finance for adaptation projects… To promote investment and financing from public and private financial institutions, work on the use of microfinance and visualization of social and economic benefits.
- Dissemination of initiatives through international standardization, cooperation with the Sendai Framework for Disaster Reduction and various international conferences, etc.

(7) Realization of a biomanufacturing revolution

① Long-term goals for the foreseeable future

- Achieve a total market expansion of 92 trillion yen in 2030.
- Achieve an annual domestic biotechnology-related investment of 3 trillion by 2030.

② Progress since second report of the committee

【Accelerate the development of microorganism/cell design platform technology and production technology】

- Using the Green Innovation Fund Project and the Biomanufacturing Revolution Promotion Project, we are strategically organizing projects with a view to early social implementation... We are also promoting the development of technologies and promoting the entry of businesses in different fields, mainly microorganism and cell design platform businesses, as well as collaboration among businesses. The project also promotes the entry of companies in different fields, particularly microorganism and cell design platform companies, as well as collaboration among businesses. Under the Green Innovation Fund Project (with a budget ceiling of 176.7 billion yen), in March 2023, a total of six projects (with total government funding of 180.6 billion yen) were selected to produce various chemical products, such as bioplastic polymers, using CO2 as a raw material. The total amount of government-sponsored projects that exceed the budget ceiling will be narrowed down by checking the progress toward achieving the R&D goals and narrowing down the technologies, thereby bringing the total amount of government-sponsored projects within the budget ceiling. In the Biomanufacturing Revolution Promotion Project (with a budget ceiling of 300 billion yen), a total of six projects (with a total national budget of 29.7 billion yen) have been adopted to produce high value-added and general-purpose products from food residues, waste wood, waste cooking oil, and other resources. The project composition will continue to be promoted and the adopted projects will be accelerated. In addition, "the MEXT and METI Governing Board (biomanufacturing)" was established in collaboration with the "biomanufacturing" of the "Innovative GX Technology Creation Project (GteX)" of the Japan Science and Technology Agency (JST), which is under the jurisdiction of the MEXT. It will continue to promote the sharing of the progress of projects of the two ministries, mutual use of facilities and equipment, promotion of exchange of human resources, and other related projects and cooperation between the two ministries.

【Establishment of domestic industrial base through the development of business environment, etc.】

- Develop and secure human resources that are in short supply to promote the implementation of bio manufacturing, such as in the bio x digital field... The biotech foundries established in the Kanto and Kansai regions as part of the "Development of Production Technology for Bio-based Products to Accelerate Carbon Recycling" project will be used for the purpose of training human resources who will be responsible for biotech manufacturing. The "Human Resource Development Program" was opened for the purpose of developing human resources for manufacturing, and human resource development courses were held mainly for companies.
- The Center has enhanced its microbial genetic resources, developed the infrastructure for a cross-disciplinary platform for the integration of biotechnology and digital technology, and promoted the further aggregation and expansion of biological resource data and the utilization of such data.

③ Measures that need to be considered in the future

【Accelerate the development of microorganism/cell design platform technology and production technology】

- To materialize the policy of market creation and expansion of bio-derived products based on the results of the adoption of the Green Innovation Fund Project and the Biomanufacturing Revolution Promotion Project.
- Accumulation of data, promotion of collaboration among companies, and establishment of safety standards based on the research results from the Green Innovation Fund Project and the Revolution in Biomanufacturing Promotion Project.
- Promotion of international collaboration...Following the G7 (Sapporo Ministerial Conference on Climate, Energy and Environment) held in April 2023, where a common understanding was formed that biomanufacturing is the key to solving climate change and resource shortages, bilateral collaboration and multilateral rule formation in biotechnology will be promoted. The project will promote international collaboration, including bilateral cooperation and the formation of multilateral rules on biotechnology.

【Efforts to improve the market environment】

(Acceleration of technology development)

- Since biogenetic resources are the foundation of microorganism and cell design platform technologies, continue to develop the infrastructure for biogenetic resources and data platforms that accumulate biogenetic resources and related information (e.g., biological characteristics information, omics information). In addition to newly collecting microorganisms and related data that will contribute to biofoundries, the project will promote the integration of information on biogenetic resources held by companies, public institutions, universities, and other organizations, promote utilization, and link data, thereby developing an environment that integrates biotechnology and digital technologies and accelerating social implementation of biomanufacturing.

(Efforts to create and expand markets for bio-derived products)

- A mechanism to transfer the environmental value of bio-derived products into economic value... In order to enhance market predictability for companies working on bio-conversion of raw materials and processes, measures based on the "Growth-oriented Carbon Pricing Concept" will also be utilized.
- A mechanism to quantitatively evaluate the environmental value of biomass and biotechnology utilization, such as the use of carbon footprint (CFP) and the establishment of life cycle assessment (LCA) methods, as well as a certification and crediting mechanism and a labeling method for bio-based products that reduce environmental impact, will also be considered for the commercialization of bio-based materials and products. The system of certification and crediting, and the labeling of bio-derived products that reduce environmental impact will also be studied.
- Standardization of technologies: Strategically promote international standardization of bio-based products by conducting surveys on international standardization, actively participating in international standardization activities, and encouraging domestic players to engage in international standardization.

- Pursue diversification of raw materials and sustainability by expanding industrial use of domestic biomass and promoting utilization of unutilized resources such as CO2 and waste.
- Promote consideration of measures to stimulate demand with reference to the Green Purchasing Law, etc., so that markets for bio-based products can be created and expanded as soon as possible.
- In the chemical industry, utilize GX Economic Transition Bonds to promote the conversion of raw materials to bio-based raw materials produced from plants and other materials with low life-cycle emissions.
- In the pulp and paper industry, utilize the GX Economic Transition Bonds to promote the shift to a biorefinery industry that utilizes wood pulp, which has the potential to become an alternative material to fossil fuel-based products.

【Establishment of domestic industrial base through the development of business environment, etc.】

- Continue to develop a biofoundry base through the "Development of Production Technology for Bio-based Products to Accelerate the Realization of Carbon Recycling," which has been implemented since FY2020, and consider the development of further demonstration bases.
- Identify the needs for knowledge and human resources required according to the biomanufacturing value chain, taking into account the increasing demand for a variety of expertise in synthetic biology and fermentation production, AI and other digital fields, engineering, and management to lead businesses to success. By promoting efforts to develop and secure the human resources required by industry, and by continuing to implement a program to develop manufacturing human resources using biofoundry centers, utilizing the "Development of Production Technology for Bio-based Products to Accelerate the Realization of Carbon Recycling," etc., which has been implemented since FY2020, promote the development of human resources capable of bridging cutting-edge research and industry.
- In order to create an environment conducive to the growth of start-ups, start-up support measures will be advanced in coordination with the government's overall start-up support initiatives, addressing the challenges and needs of the industrial structure and players in domestic bio-manufacturing.
- To improve the competitiveness of domestic players regarding laboratory equipment, measuring instruments, sensors, and reagents, for which demand is expected to increase in line with the expansion of the biomanufacturing field, we will provide opportunities and create mechanisms for collaboration in the field of basic research in Japan, in cooperation with related ministries. Support will be provided by promoting collaboration with such users and encouraging the joint use of analytical instruments in shared laboratories and joint-use facilities in academia.
- Promote data utilization and collaboration to enhance the competitiveness of domestic players in biomanufacturing.
- Facilitate industry-academia-government and cross-disciplinary collaboration and consultation among stakeholders in the biomanufacturing area.

(8)Establishment of a growth-oriented, resource-autonomous circular economy

① Long-term goals for the foreseeable future

- The Circular Economy market will be 80 trillion yen in 2030 and 120 trillion yen in 2050.

② Progress since second report of the committee

【Revision of institutional framework to accelerate arterial and venous linkages, measurement and disclosure of circulation, CO2 emissions】

- Consideration of expansion and strengthening of 3R-related legislation...In September 2023, "the Waste and Recycling Subcommittee", which had been established under "the Industrial Technology and Environment Subcommittee", was developmentally reorganized to establish the Resource Recycling and Economy Subcommittee. The Subcommittee has held eight discussions so far on the promotion of the use of recycled materials, resource recycling through recycling-conscious design, visualization and disclosure of recycling, and promotion of efficient use and CE commerce of products and has been studying the expansion and strengthening of 3R-related legislation.

【Industry-Government-Academia Circular Economy Partnership, International Collaboration】

- Promotion of Industry-Government-Academia Circular Economy Partnership...In September 2023, the industry-government-academia partnership "Circular Partners (CPs)" was launched to realize the Circular Economy through industry-government-academia collaboration, and as of the end of May 2024, approximately 444 members had joined. Under the Circular Partners, a working group to study vision and roadmap, a working group to establish a circular economy information distribution platform, and a working group to establish a regional circulation model were established and started discussions.
- International Collaboration...Regarding international standardization, discussions are underway at ISO/TC323 to promote efforts for international standardization of the Circular Economy. The fourth session of the Intergovernmental Negotiating Committee (INC) on the Convention on Plastic Pollution was held in April 2024, and Japan contributed to the revision of the draft article while making its own arguments. Regarding the revised Basel Convention, the OECD Secretariat proposed an amendment to the OECD Council Decision, which stipulates exceptions to the Basel Convention among OECD member countries, to exclude waste electrical and electronic equipment (E-scrap) from the Green List, but Japan expressed its opinion to maintain E-scrap as Green List items. However, Japan expressed its opinion to maintain E-scrap as a Green List item, and it was decided to maintain it.

【Construction of an information distribution platform, etc. to ensure traceability through the use of digital technology】

- Supporting the establishment of an information distribution platform to promote data distribution to ensure traceability...A "Circular Economy Information Distribution Platform Construction Working Group" was established under Circular Partners, and discussions were initiated to launch the information distribution Discussions were initiated to launch the platform.
- SIP project "Construction of a Circular Economy System" was implemented...A kick-off meeting was held in September 2023. Discussions were initiated on digitalization and commonization to

support visualization and business expansion in the circular market, arterial/static artery linkage to promote expansion of resource circulation, and development of a platform for improving circularity and visualization.

【Support for R&D and capital investment to realize CE】

- GX up-front investment support...In the field of resource circulation, the government has decided to provide 10 billion yen over the next three years. The "Project to Promote Resilience of Autonomous Resource Circulation System through Industry-Government-Academia Collaboration" (3.5 billion yen) was allocated.

③ Measures that need to be considered in the future

【Revision of institutional framework to accelerate arterial and venous linkages, measurement and disclosure of circulation and CO2 emissions, etc.】

- Study on expansion and reinforcement of 3R-related legislation...Summarize the direction of discussions being conducted by the "Subcommittee on the Economy of Resource Recycling" on promotion of the use of recycled materials, visualization and disclosure of easy resource recycling through circulation-conscious design, promotion of efficient product use and CE-commerce, etc.

【Industry-government-academia circular economy partnerships, international collaboration】

- Promote industry-government-academia Circular Economy Partnership...Utilize "Circular Partners" to promote discussion of measures necessary to realize the Circular Economy in industry, government and academia. In addition to deepening discussions on the formulation of a vision and roadmap, the establishment of a circular economy information distribution platform, and the creation of a regional circulation model, discussions will also begin on arterial and venous linkages, business models, standardization, value creation, technology, and the creation of new industries and businesses.

【Establishment of an information distribution platform, etc. to ensure traceability using digital technology】

- Centered on the Circular Partners' "Working Group for the Construction of a Circular Economy Information Distribution Platform", the Working Group will consolidate a wide range of domestic and international knowledge and experience related to the construction of a circular economy information distribution platform, and utilize the mechanism established by the Ouranos Ecosystem to create a world-class Construct a common platform in each industry.

【Support for R&D and capital investment to realize CE】

- In order to expand and promote linkage of arterial and venous industries (effective design for recycling, advancement of sorting and recycling technologies, etc.) and expansion of their scale, the project will provide support for investments from research and development to demonstration and implementation, realizing a combined public-private investment of over 2 trillion yen over the next 10 years in the field of resource recycling.

＜Updating Socioeconomic Operating-System (OS)＞

(9) Human resources

① Long-term goals for the foreseeable future

- Implement measures to address labor shortages.
- Achieve sustained wage increases that exceed price increases.
- Aim to strengthen the competitiveness of human investment and human resources.

② Progress since second report of the committee

【Thoroughly addressing labor shortages】

- Supporting the success of workers with time constraints...From FY 2023, METI has implemented measures in its subsidies that, in principle, give extra points to companies that promote childcare support and women's empowerments, while taking into account the purpose of the subsidy. In addition to the implementation of the "Subsidy for Femtech Support Service Demonstration Project," in November 2023, METI held a seminar and networking session for corporate personnel in charge of human resources, DEI(Diversity, Equity & Inclusion), and employee benefit programs for the purpose of increasing corporate interest in working women's health issues through the use of Femtech and other services. Demonstration projects were conducted to provide SMEs with opportunities to use housekeeping services through employee welfare programs.
- Introduction of the Guidelines on Human Resources Utilization for SMEs, etc... The Guidelines were introduced to ministries and support organizations. In addition, seminars of the Guidelines for SMEs and support organizations were held by Regional Bureaus or Economy, Trade and Industry.
- Promotion of foreign human resources (Measures to be taken in light of the discussion on the revision of the Technical Intern Training System and the Specified Skilled Worker System)...In light of the situation where it is still difficult to secure human resources despite efforts to improve productivity and to secure domestic human resources, the Cabinet decided to add a new industry and business category to the Industrial Product Manufacturing field under the Specified Skilled Worker System.
- Promoting capital investment for labor shortage...In the supplementary budget for FY2023, the "SME's capital investment for labor shortage subsidy" was newly established, and the "Labor-Saving (Custom-Made) Quota" of the monozukuri subsidy was newly established.

【Strengthening Efforts for Wage Increases】

- Continuation of price pass-on measures and proper business transactions for small and medium-sized enterprises (SMEs)... Based on the "Price Negotiation Promotion Month," guidance and advice were provided to top management of clients with unfavorable conditions, a "list of companies" for price negotiation and shifting was published, and "guidelines" for shifting labor costs were disseminated, thoroughly understood, and promoted for use. The program has been implemented.
- Promotion of expanded measures to support productivity improvement of SME...To gain funds for wage increases, addition measures were implemented in subsidies when SME made efforts to increase wages by more than the minimum wage increase range while improving productivity.
- Strengthening of the tax system for raising wages...In the 2024 tax reform, the tax system for raising wages were strengthened. Specifically, the tax system for small and medium-sized

enterprises (SMEs) was strengthened by creating an unprecedentedly long-term five-year carry-over tax credit, allowing even loss-making SMEs that have been unable to take advantage of this tax system to take up the challenge of raising wages[82].

【Facilitation of labor migration through activation of internal and external labor markets】

- Promoting activities of the Human Capital Management Consortium…The 2nd General Meeting of the Human Capital Management Consortium was held in October 2023. To accelerate efforts to practice and disclose human capital management, the consortium published a collection of case studies that summarize the details of efforts and innovations of advanced cases among the consortium's members.
- Implemetation of Career Development Support Program through Reskilling…Integrated support was provided to incumbents, ranging from career counseling to reskilling and job change support. The estimated amount of grant decisions (estimated implementation amount) for 107 adopted projects from the first to the third round of the public offering was approximately 28 billion yen.
- Facilitating highly-skilled foreign professionals to play more active role in Japan…From the perspective of expanding business opportunities, revitalizing organizations through diversification of human resources, and realizing innovation promotion, the government promoted the acceptance of highly-skilled foreign professionals (For details, see the section "Globalization and Realization of Economic Security" on p. 112.)

【Reskilling and human resource development by the public and private sectors】

- Fostering Human Resources for Digital Promotion… Implemented human resource development measures to realize the government-wide target of developing 2.3 million digital promotion human resources by the end of FY2026. (reiterated)
- Implementation of Career Development Support Program through Reskilling…Integrated support was provided to incumbents, ranging from career counseling to reskilling and job change support. The estimated amount of grant decisions (estimated implementation amount) for 107 adopted projects from the first to the third round of the public offering was approximately 28 billion yen.(reiterated)

③ Measures that need to be considered in the future

【Thoroughly addressing labor shortages】

- Supporting the success of workers with time constraints…Increasing the number of companies that address the health issues of working women through the dissemination of the results of "Subsidy for Femtech Support Service Demonstration Project."
- Dissemination of the Guidelines on Human Resources Utilization for SMEs, etc…Disseminating of the Guidelines by collecting examples of the utilization of the Guidelines and conducting seminars and workshops using such examples.
- Promoting capital investment for labor shortage…Supporting SME's capital investment for labor shortage in order to alleviate structural labor shortages.

[82] See Reference Materials P98

【Strengthening Efforts for Wage Increases】

- Promotion of price pass-on measures and proper business transactions for SMEs…Considering measures to strengthen price shifting by enhancing enforcement of the Act against Delay in Payment of Subcontract Proceeds, Etc. to Subcontractors (e.g., through cooperation with the JFTC and ministries and agencies with business jurisdiction) and thorough price shifting of labor and other costs in public sector demand.
- Promotion to support productivity improvement of SMEs…In order to secure the source of the wage increase, the program will give extra points in the adoption of subsidies to companies that make ambitious efforts to raise wages above the minimum wage increase range, while working to improve productivity.
- Dissemination of the tax system for raising wage…To promote the utilization of the tax system for raising wages, which was strengthened in the 2024 tax reform, we will conduct publicity using pamphlets and SNS, etc.

【Facilitation of labor migration through activation of internal and external labor markets】

- Promotion of Career Development Support Program through Reskilling…Continuing to provide integrated support for incumbents, from career counseling to reskilling and job change assistance, and promote reskilling and labor mobility facilitation in an integrated manner.
- Facilitating highly-skilled foreign professionals to play more active role in Japan…Promoting the acceptance of highly-skilled foreign professionals from the perspective of expanding business opportunities, revitalizing organizations through diversification of human resources, and realizing innovation promotion. (For details, see the section "Globalization and Realization of Economic Security" on p. 116.)

【Reskilling and human resource development by the public and private sectors】

- Fostering Human Resources for Digital Promotion…Aiming to realize an ecosystem for the development of digital skills by establishing a platform that enables the management of information on the digital skills of digital human resources, upskilling assessment through examinations. (reiterated)
- Promotion of Career Development Support Program through Reskilling…Continuing to provide integrated support for incumbents, from career counseling to reskilling and job change assistance, and promote reskilling and labor mobility facilitation in an integrated manner. (reiterated)
- Fostering human resources with advanced expertise, such as Ph.D. …To develop highly specialized human resources, it is important to increase the number of people entering doctoral programs, playing active roles in society, etc. Study of guidance and guidelines (tentative) for doctoral personnel to play active roles in the private sector in cooperation with MEXT, and promotion of doctoral degree acquisition by employees participating in joint research with universities.

(10) Startup Innovation

① Long-term goals for the foreseeable future

- In the amount invested in startups, 10x investment in the next 5 years (by 2027).
- Total R&D investment by the public and private sectors to total approximately 120 trillion yen from FY2021 to FY2025.

② Progress since second report of the committee

【Startup First】

(Expansion of startup creation)

- Expansion and horizontal development of Uncharted Territory Challenge... Expansion to local regions, horizontal development to NEDO, AIST, AMED, JST
- Expansion of startup visa...add VCs, accelerators, etc. to the list of organizations managed and supported by private institutions and consider extending the maximum period of stay.
- Promotion of startup creation by carving out superior technologies and human resources from business companies, etc. ... strengthening support for R&D conducted by those who have carved out their own businesses and promoting matching of researchers and management personnel and fostering of entrepreneurs.
- Expansion and extension of the special tax treatment for partial spin-offs
- Expansion of the angel taxation system (to cover the acquisition amount of paid-in stock acquisition rights and investments through trusts) [2024 Tax Reform]
- Improvement of compensation system for acquiring human resources, including stock option taxation
- Overseas dispatch of entrepreneurs, etc.
- Facilitation of labor mobility and promotion of side/concurrent jobs
- Support for matching technology seeds and management personnel

(Creation of mega-startups, maturation and expansion of startup ecosystem)

- Expansion of tax-qualified stock options, elimination of stock custodian requirement, relaxation of requirements for granting stock options to outside high-level personnel and reduction of certification procedures, and substantial increase in the maximum exercise amount [2024 tax reform]
- Deregulation of stock option issuance about startups (expanding the scope of matters and the period of delegations those are allowed to be delegated from the general shareholders' meeting to the board of directors)
- Extension of the taxation system to promote open innovation to promote the utilization of management resources in large companies [Tax Reform of 2024]
- Expansion of LPS investment targets to cryptoasset, etc., relaxing of requirements for foreign investment ratio restrictions, and positioning of fair value assessment in LPS accounting rules[83]
- Focused support for the creation of global unicorns (J-StarX, Japan Innovation Campus)
- Strengthening the support measure of dispatching IP specialists to VCs, promoting push-type support from the examiner's side (e.g., providing interview opportunities) in patent examinations

[83] See Reference Materials P97

- Extension of JIC's operational deadline[84]
- Deep Tech Startup Policy Package...Strengthen support for startups that solve social issues/support for innovation tied to a group of mission measures
  *See "Startup and Innovation Policy Focusing on Mission Areas" below
- Promoting public procurement by startups
- Intensive support for the creation of global unicorns and mega startups
- Expansion of the angel tax system to encourage inflows of capital from individuals
- Promotion of fair value assessment to attract institutional investors, etc.
- Strengthening the supply of funds through public-private funds
- Debt guarantee system to encourage the use of venture debt
- Support for R&D by NEDO and others
- Development of secondary market
- TSE Growth Market Reform
- Promotion of government procurement from startups, including SBIR
- Promotion of open innovation and M&A through open innovation promotion taxation, etc.
- Promotion of spin-offs and carve-outs
- Utilization of JOIC and promotion of matching with J-Startup companies, collaboration with Keidanren (Startup Friendly Scoring)

【Creation of human resources and intellectual capital】

- The Tax Reform Proposal for FY2024 clearly states that an innovation box tax regime will be established to apply tax breaks to income derived from patents and software intellectual property in order to strengthen the competitiveness of R&D centers and encourage investment in intangible assets by the private sector. in the Tax Reform Proposal for FY2024
- The "Public-Private Support Program for Young Researchers" continues to support the research of young researchers who can create innovations and support industry-academia partnerships with private companies
- Improvement of the environment to create star scientists who can have an impact on industry (e.g., mobility of human resources and cross-border)
- Held a "Study Group on Diversification of Career Routes for Doctoral Candidates to Industry" to understand the issues faced by employment service operators for doctoral candidates and the overall issues related to the connection between doctoral candidates and companies

【Increase the number of challenges based on the premise of failure】

- Shift from trial to full-scale introduction of prize-funded research and development programs
- Utilization of stage gates in R&D support business (introduction of a system that allows flexible selection of direction changes (pivots) and early withdrawals)
- Augment the Moonshot Fund and introduce new evaluation indicators... augment the Moonshot Fund and introduce new indicators and mechanisms to proactively evaluate "failures" that encourage more ambitious challenges

[84] See Reference Materials P96

【Intensive support for market creation】

- Promoting social implementation in R&D projects…Targeting efforts to promote social implementation in R&D projects (management commitment, linkage with business strategy and financial planning, technology research using TSC, etc., standardization strategy, EBPM, etc.) as Green In FY2023, 19 projects from the Green Innovation Fund and 16 themes from the Post-5G Fund have been standardization follow-up projects. The Industrial Competitiveness Enhancement Law Amendment Act was enacted, which includes a plan approval system to support the promotion of open and closed strategies for joint R&D by companies, universities, and other organizations.
- Promote companies' efforts to formulate rules…To ensure that companies engaged in international standardization and other rule-making activities incorporate such activities into their management strategies and are evaluated by the capital market, the establishment of CSOs (Chief Standardization Officers) and integrated reporting based on the "Value Creation Guidance" and other guidelines have been established. In order to ensure that companies that engage in international standardization and other rule-making activities incorporate these activities into their management strategies and are evaluated by the capital market, we will promote the establishment of CSOs (Chief Standardization Officers) and inclusion in integrated reports, strengthen the description of standardization strategies in the "Guidelines for IP/Intangible Asset Governance," prepare and publish case studies of results, and other measures to encourage companies and investors to understand and change their behavior.
- Strengthening the framework for standardization activities (develop and utilize standardization human resources, develop a standardization human resources information directory (STANDirectory), strengthen cooperation with academia (academic societies), etc.)
- Strengthen support for full-scale commercialization of private-sector satellites, rockets, etc. by utilizing the Space Strategy Fund
- Deep Tech Startup Policy Package (reiterated)
- Through the Japan Agency for Medical Research and Development (AMED), support the practical development of innovative pharmaceuticals by Pharmaceutical Startups in which registered venture capitals have invest, and improving the financing environment, such as optimizing the listing criteria for bio-startups.
- Strategic project formation with a view to early social implementation of biomanufacturing using the Green Innovation Fund Project and the Biomanufacturing Revolution Promotion Project (promoting technological development, as well as the entry of businesses in different fields, mainly microorganism and cell design platform businesses, and collaboration among businesses) (Promote technological development, and encourage the entry of businesses in different fields, particularly microorganism and cell design platform businesses, as well as collaboration among businesses).

【Startup and innovation policy focused on mission areas】

(Startups)

- GX field…Radically strengthen support for R&D and social implementation for startup companies in GX-related fields
- DX field…Support for development costs and other expenses for startups working to create use cases for next generation semiconductors

- Healthcare sector...Development of startup development programs in collaboration with leading overseas VCs and accelerators with strengths in the healthcare sector, and promotion and environmental improvement of innovative medical device development by startups
- Space Sector...Strengthen support for full-scale commercialization of private-sector satellites and rockets, including startups, by utilizing the Space Strategy Fund
- Defense Sector...Promotion of a framework for matching startups with excellent dual-use technologies with the needs of the Ministry of Defense, Self-Defense Forces, etc., and promotion of utilization of startups' advanced technologies in the defense sector
- Resilience field...Study on promotion of introduction of advanced disaster prevention technologies to municipalities using SBIR, etc.
- Biotech sector...Utilization of 350 billion yen fund of the Japan Agency for Medical Research and Development (AMED), and improving the financing environment, such as optimizing the listing criteria for bio-startups.
- Impact startups...Establishment of "J-Startup Impact," dispatch of young human resources for training at overseas impact startups, etc., and promotion of registration and utilization of experts to support certification under the B-Corp system.
- Creative field...For companies working to create new businesses in the creative field, including overseas such as Silicon Valley, and startups in Japan that are actively working to enter other fields to strengthen multimedia and overseas exports, we will provide support for their business implementation. Support for the implementation of their businesses

【Strengthening Computational Infrastructure and General Purpose Technology as a National Strategy】

- Strengthening industrialization and global collaboration of quantum technology...In July 2023, AIST established Global Research and Development Center for Business by Quantum-AI technology (G-QuAT) as a base for industrialization and global collaboration of quantum technology. In G-QuAT, the following efforts are being made toward the industrialization of quantum technology: the development and enhancement of the environment for quantum and classical computation, including the installation of quantum computers; the expansion of the creation of use cases utilizing this environment; the development of devices for the development of next-generation large-scale quantum computers; the acceleration of supply chain construction through the evaluation and international standardization of materials; and the fostering of global quantum industry human resources through collaboration with domestic and foreign companies and research institutes. The supplementary budget for FY2023 has also been allocated to strengthen the functions of G-QuAT. In addition, as global collaboration, we concluded a memorandum of cooperation with Canada in the field of industrial technology, including quantum technology (September 2023), and AIST conducted a memorandum of understanding on comprehensive research cooperation in quantum cooperation with the National Institute of Standards and Technology (November 2023), the National Research Council of Canada (November 2023), and the Korea Institute of Standards and Science (January 2024).
- Further development and expansion of computing resources by the public and private sectors using the FY2023 supplementary budget. In addition, the GENIAC project, a measure to promote the development of basic models for generative AI by the private sector, mainly start-ups, will be

launched in February 2024 to encourage the development of basic models by the private sector. In addition, AIST will build and strengthen its capability to develop basic models for language, image, robotics, and other basic models.

- We will continue to promote the development of AI development resources by the public and private sectors, aiming for a total domestic scale of 60 EFLOPS by the end of FY2027. Construct multimodal AI infrastructure models for robotics, etc., utilizing AIST's ABCI (AI bridging cloud), which was expanded through the FY2023 supplementary budget.

③ Measures that need to be considered in the future

To deepen discussions on the promotion of the "innovation cycle," in which new value is created from technologies and ideas generated by research and development, etc., and disseminated and penetrated to society and customers (social implementation), leading to the creation of markets and the acquisition of compensation, which in turn leads to further investment in people, technologies, facilities, etc., and investment in research and development, In February 2024, "the Subcommittee on Innovation" was established under the Industrial Technology and Environment Subcommittee of the Industrial Structure Council. The Subcommittee will deepen discussions on innovation policy, including start-up policy, and is scheduled to release an interim summary this month. "The Subcommittee on Innovation" will continue to promote innovation policy as a social infrastructure (OS) based on the discussions of the Innovation Subcommittee. The main issues currently under discussion are as follows

【Quantitative and qualitative expansion of R&D】

(Promotion of R&D investment by large companies and start-ups)

- Promoting R&D investment through visualization of investment efficiency (introduction of indicators to evaluate R&D investment efficiency)
- Expansion of R&D credits to enable large companies and start-ups to actively invest in R&D
- Expansion of the portfolio of support for startups and improvement of the environment for startups in the government-provided
- Appropriate evaluation process for R&D projects conducted by the government

(Explore and cultivate frontier areas where the country should create momentum)

- Strengthen technological intelligence (utilize networks of NEDO/TSC, AIST, etc.)
- Explore and nurture frontier areas and create a roadmap for social implementation (Quantum, nuclear fusion, etc. are assumed to be the first areas to be addressed)
- Utilize new policy tools (implementation of prize-funded research and development program, possession of assets by the government)

【Commercialization and value-added creation】

(Mobilization of resources owned by large companies, etc. (human resources, technology, equipment, financing/procurement))

- Promotion of "cross-border learning" (formulation of guidelines and case studies), creation of quotas to support female entrepreneurs
- Promotion of carve-outs (demonstration to disseminate guidance and case studies)

- Utilization of facilities of national research institutes, etc. (matching with needs for use of SUs, etc., and development of rules)

(Support for startups taking on the challenges of new industries and new businesses)

- Improvement of financing environment at the rater/growth stage
  - Expansion of growth financing at the unlisted stage
    - ✓ Formulation of VC Principles to improve VC governance
    - ✓ LP investment in VC by JIC and SMEs, direct investment in startups by JIC-VGI
    - ✓ Introduce pension and foreign funds into VC through thorough fair value assessment (market valuation)
    - ✓ Promoting the use of venture debt (e.g., debt guarantees by SMEs, preparation of guidance, etc.)
    - ✓ Activation of secondary market such as JIC secondary fund
  - Promoting M&A
    - ✓ Promote the use of open innovation tax credits
  - Promoting growth after listing
    - ✓ Promoting M&A through flexible asset valuation of goodwill
    - ✓ Consider reviewing criteria for maintaining listing
- Global Expansion Support
  - Fostering "Born Global" Entrepreneurs
    - ✓ "J-StarX", a program for sending entrepreneurs and others overseas
  - Support for expansion into overseas markets
    - ✓ "Japan Innovation Campus"
    - ✓ "VIVATECH 2024"
    - ✓ "Global Acceleration Hub"
    - ✓ Support for business development and human resource development in the "Global South"
    - ✓ Support for overseas technology demonstration and international joint research by deep tech startups (NEDO)
  - Attracting foreign human and financial resources
    - ✓ Supporting foreign entrepreneurs to start their own businesses by promoting the use of start-up visas and extending the maximum period of stay
    - ✓ Promote investment in Japanese startups by overseas VCs through LP investment by JIC and SMEs
    - ✓ Organize international events inviting top foreign VCs and others
- Fostering deep tech startups that give Japan a competitive edge
  - Securing and fostering management talent

- ✓ Matching support for management personnel (university-launched startups, carve-outs)
- ✓ Expert accompaniment support for carve-out startups

- ➢ R&D funding
  - ✓ NEDO funding for deep tech startups (support extended to business development)
  - ✓ AMED funding for R&D of pharmaceutical startup
  - ✓ Establishment of the Space Strategy Fund
  - ✓ Support for university startups

- ➢ Expanding public procurement
  - ✓ SBIR (Supporting Research and Development for Public Procurement)
  - ✓ Relaxation of bidding qualifications for public-private fund investees and other startups
  - ✓ Improvement of voluntary contracting mechanism to expand procurement from startups

【(Cross-cutting efforts from "technology/idea" to "new value" and "market creation/compensation")】
(Develop and utilize advanced human resources in Japan and overseas who can develop high value-added fields)

- Project development to foster diverse human resources such as entrepreneurs, young researchers, and those who challenge overseas markets through collaboration between industry, academia, and government.
- In order to nurture future innovators, companies, local governments, and schools will collaborate to examine measures to secure resources to provide advanced learning for children and an ecosystem to support learning.

(Standardization strategies for strategic market acquisition from an early stage, etc.)

- Support for initiatives for open and closed strategies that integrate the use of IP and standardization

(Eliminate regulatory hurdles for startups to take on new business challenges)

- Establishment of a system to individually support the identification of relevant laws and regulations pertaining to regulation and the use of various support systems.

(11) Value Creation Management

① Long-term goals for the foreseeable future

- Ratio of Japanese representative companies (assuming TOPIX 500 companies) with a P/B ratio of 1x or more in 2030 from about 60% to about 80% (on par with STOXX 600 in Europe).

② Progress since second report of the committee

【Capital Market Reform】

(TSE initiatives)

- The following initiatives being promoted by the TSE are in line with the discussions at the Committee on New Direction of Economic and Industrial Policies, Industrial Structure Council, which has been trying to encourage efforts toward value-creating management in a situation where corporate value has not been fully developed, with many listed companies having a P/B ratio of less than 1x. From the perspective of promoting corporate management reform and industrial policy, we continued to actively cooperate with and support the following initiatives.
  - We have strongly requested all Prime and Standard listed companies to analyze their current status and formulate and disclose improvement plans for return on capital such as ROE and market valuation such as P/B ratio. A list of companies that have formulated and disclosed plans will be published (updated monthly) to promote management that is aware of the cost of capital and stock price. In addition, the company will compile and publish key points and examples of cost of capital and stock price conscious management from the perspective of investors.
  - Introduced a new index (JPX Prime 150 Index) that selects the top 75 companies in terms of equity spread (ROE − cost of equity) and the top 75 companies in terms of market capitalization with P/B ratios of greater than 1x. ETFs linked to the JPX Prime 150 Index are listed.
  - Clarify the deadline for transitional measures and reiterate the purpose of "comply or explain" for "substantiate" corporate governance of listed companies, which tends to fall into "formal compliance" only, and clearly indicate good examples and insufficient examples to encourage voluntary inspections.
  - Announced that for companies listed on the prime market, it will be mandatory to disclose financial information (e.g., Financial Results) and timely disclosure information in English at the same time as in Japanese (effective for disclosures made on or after April 1, 2025, with a one-year grace period).
  - Based on the discussions at the "Study Group on Minority Shareholder Protection in Dependent Listed Companies," the board of directors of listed companies with controlling shareholders, etc., summarized and announced the expected role of independent outside directors, as well as the enhancement of information disclosure regarding minority shareholder protection and group management.

(Efforts by the Financial Services Agency)

- While the development of codes and guidelines for corporate governance contributes to the formulation and establishment of formalities, detailed regulations may lead to the formality of the

codes and guidelines, and there is a need to create an environment that encourages autonomous awareness. The following issues presented in the "Action Program" published by the Financial Services Agency are important issues, and we have worked together to address them.

- Consideration of reviewing the large shareholding reporting system, which is a disincentive to engagement.
- Consideration of Tender Offer System
- Consideration of the status of transparency of real shareholders
- Independent Outside Directors Performing Their Functions

- We worked in cooperation on promoting a "virtuous cycle of growth and distribution" through the investment chain by upgrading asset management companies that are responsible for managing investments from households and generating returns, as well as promoting the supply of growth capital to companies and returning the results to households and on advance efforts toward the realization of an asset management nation. The report of the "Market System Working Group, Asset Management Task Force" was released in December 2023.
  - Upgrading Asset Management Companies
  - Financial Institutional Initiatives for Asset Owners
  - Substantiation of stewardship activities
  - Supply of growth capital and diversification of asset managers
  - Improving the investment environment for households

【Business Management Reform】

(Promotion of value-creating management to sustainably enhance of corporate value)

- Selection of "SX Brands" and penetration of models...In April 2024, a group of leading companies that formulate strategies for sustainable value creation by resolving social issues, etc. and implement necessary management and business reforms (SX) were selected and awarded. The report is published together with the analysis report as a role model and is intended to be disseminated so that it can be referenced and utilized by listed companies when formulating "improvement plans" in response to the above request by the TSE.
- Examples of the use of sustainability-related data in management strategies...To encourage companies to change their awareness and develop a system to efficiently collect and strategically use sustainability-related data needed to implement SX management, we will formulate and publish a report including good practices, we have also promoted the report through speeches and contributions.
- Formulation of Guidelines for Corporate Takeovers.
- Expansion and extension of the special tax treatment for partial spin-offs.
- Support for Outside Directors...Organized key points on how training should be utilized, prepared and published a collection of practical case studies, and prepared and published "The Basics of Being an Independent Director" for newly appointed or inexperienced outside directors.

③ Measures that need to be considered in the future

【Capital Market Reform】

(TSE initiatives)

- The following initiatives being promoted by the TSE are in line with the discussions at the New Opportunities Subcommittee, which has been trying to encourage efforts toward value-creating management in a situation where corporate value has not been fully developed, with many listed companies having a P/B ratio below 1x. From the perspective of promoting corporate management reform and industrial policy, we will continue to actively cooperate with and support the following initiatives.
  - We will monitor the status of formulation and disclosure regarding analysis of the current status and improvement plans for return on capital such as ROE and market valuation such as P/B ratio by Prime and Standard-listed companies. And we will update the "List of Companies" monthly, which lists companies that have disclosed those types of information and regularly monitor disclosure status. Through these measures, we will continue to promote management with an awareness of the cost of capital and stock price.
  - While regularly monitoring the implementation status of mandatory English disclosure in the prime market, we will consider further expansion, such as the expansion of documents subject to mandatory English disclosure.

(Efforts by the Financial Services Agency

- While the development of codes and guidelines for corporate governance contributes to the formulation and establishment of formalities, detailed regulations may lead to the formality of the codes and guidelines, and there is a need to create an environment that encourages autonomous changes in awareness. The following issues presented in the "Action Program" published by the Financial Services Agency are important issues and the consideration will be given to future revisions of the system, etc. based on the report of the "Working Group on the Tender Offer System and Large Shareholding Reporting System, etc." released in December 2023, we will continue to work in cooperation.
  - Consideration of reviewing the large shareholding reporting system, which is a disincentive to engagement
  - Consideration on Tender Offer System
  - Consideration of the state of transparency for real shareholders
  - Independent Outside Directors Performing Their Functions
- To promote a "virtuous cycle of growth and distribution" through the investment chain by upgrading asset management companies that are responsible for managing investments from households and generating returns, as well as promoting the supply of growth capital to companies and returning the results to households and to advance efforts toward the realization of an asset management nation, we will continue to work in cooperation on various measures based on the reports of the "Market System Working Group, Asset Management Task Force" released in December 2023.
  - Upgrading Asset Management Companies
  - Financial Institutional Initiatives for Asset Owners
  - Substantiation of stewardship activities
  - Supply of growth capital and diversification of asset managers
  - Improving the investment environment for households

【Business Management Reform】

(Promotion of value-creating management for sustainable enhancement of corporate value)

- After reviewing the efforts and performance of companies to improve their corporate value over the 10 years since the Ito Report was published in 2014, we will analyze the issues and factors, and present the direction of response. In doing so, we will organize the issues and present the direction of response for each position with a higher resolution, bearing in mind that the issues that should be prioritized and the direction of response may differ depending on the situation (position) of the company.
- Through the SX Brands, we aim for a revival of Japanese stock and a sustainable increase in corporate value by promoting a change in the mindset of corporate management and management reform, reassessment of Japanese companies by investors in Japan and overseas, and the formation of new expectations in the market. In addition, under the framework of the Japan-U.S. JUCIP (Japan-U.S. Commercial and Industrial Partnership), round tables and other events will be held to bring together Japanese and U.S. investors and companies in order to expand investment.
- Consider, through holding a study group and other means, how the corporate initiatives should be that contribute to substantive corporate governance reform, including improving the effectiveness of the board of directors.
- Enhance understanding of corporate governance among outside directors, etc. through spread of "The Basics of Being an Independent Director" and other means.
- Consider legislation on a pre-insolvency proceeding that allows the reduction of financial debts through a majority vote without requiring the consent of all lenders.
- Review the corporate reorganization tax system, including tax treatment on partial spin-offs (a special treatment for tax on built-in gains on the transferred assets and dividends to shareholders in spin-offs in which the parent company retains a mirror portion of the SpinCo).
- Utilize P/B ratios in selecting DX Brands.
- Organize soft infrastructure issues such as corporate law, capital markets, and labor markets that hinder the promotion of management transformation, including the optimization of corporate business portfolios, and, if necessary, provide guidance as needed on how to address each issue.
- Facilitate labor mobility, etc. to improve traditional Japanese employment practices (lifetime employment, seniority system, company-based labor unions) and labor market (low liquidity, immature job-based market), which are challenges in implementing management transformation, including business portfolio optimization.

(Promotion of corporate transformation to enhance global competitiveness)

- To strengthen the globalization of Japanese companies, which has been expanding rapidly over the past 15 years, and for Japanese companies to hold key positions in global value chains, we redefine and restructure the three core functions that are responsible for resource allocation in companies; Finance (CFO), Human Resources (CHRO),and Digital (CIO/CDO), which encourages Japanese companies to achieve CX; Corporate Transformation.
  - By summer 2024, develop a reference model for implementing global management (①Finance (CFO), ②HR (CHRO), ③Digital (CIO/CDO)).

- By the end of FY2024, we will measure and categorize the progress of Japanese companies in CX focusing on large companies with a high ratio of overseas sales. We will organize individual issues when promoting CX and identify best practices and examples of failures in corporate initiatives.
- Further, we will refine the reference model to visualize the organizational capabilities that contribute to strengthening the global competitiveness of Japanese companies implemented through CX.
- Based on the fact that companies with high organizational capability are more likely to link their investments to profits (on the contrary, there are many companies that cannot link their technological capabilities to business even if they have them), we will consider using this information for the design of government budget measures and taxation systems.

(12) Public administration: EBPM and data-driven administration

① Long-term goals for the foreseeable future

- Replacement of industry (challenge to new policies or abolition of existing policies) and upgrading of policies (including qualitative changes in policies and ensuring continuity in accordance with medium- and long-term objectives).

② Progress since second report of the committee

【Verification of policy effectiveness】

- Setting of indicators for monitoring the effectiveness and progress of policies…Based on the new policy of Policy Evaluation, indicators for monitoring the effectiveness and progress of policies implemented by the Ministry of Economy, Trade and Industry were set in the summer of FY2023, considering the indicators in each measure of "New Direction of Economic and Industrial Policies".
- The effectiveness verification scenarios for large budget projects (Advanced-Semiconductor Fund and Green Innovation Fund) were developed and published.
- The logic model of the project to promote the biomanufacturing revolution was examined.
- Guidelines for setting outcome indicators for policy planning and effectiveness verification were developed.

【Maintenance of data】

- Procedures to use questionnaire information in official statistics were simplified and accelerated, and agreement on the use of data for effectiveness verification was added to the format of the application guidelines.
- In April 2024, the EBPM portal (developed and provided by RIETI) has started for METI staff.
- The environment was studied to enable the publication of indicators for monitoring the effectiveness and progress of policies in a form that is easy for the public to understand using BI (Business Intelligence) tools. (To be completed in the summer or fall of FY2024.)
- We promoted the establishment of a mechanism to utilize data obtained through administrative procedures and private-sector data with high needs for policy planning, monitoring, and effectiveness verification across the Ministry.
- Promoted data management and utilization of text data related to commissioned research projects.

【Digitalization in operations and administrative procedures】

- Promotion the online access to administrative procedures at the Ministry of Economy, Trade and Industry
- An environment for the utilization of generative AI was introduced on a trial basis to explore the possibilities of improving operational efficiency and sophistication of policy making.

【Improve staff literacy】

- A training program was conducted for some staff members to improve their literacy on EBPM.
- E-learning contents on EBPM were developed.
- Training programs were conducted for some staff members on the necessary literacy regarding the use of Generated AI and the use of BI tools.

③ Policies that need to be considered in the future

【Verification of policy effectiveness】

- For large budget projects (Advanced-Semiconductor Fund and Green Innovation Fund), progress monitoring will be promoted based on existing effectiveness verification scenarios, and new effectiveness verification scenarios (Biomanufacturing Revolution Promotion Project, the Space Strategy Fund, Global South Future-oriented Co-creation Project, etc.) will be developed and examined.
- Continuous promotion of effectiveness verification of large-scale budget projects and budget projects with a large number of data (e.g., LMEs and SMEs Subsidies for Large Scale Growth Investment with the target of raising wages).
- Horizontal expansion of the knowledge and know-how on effectiveness verification.
- Implementation of policy planning and effectiveness verification using the guidelines for setting outcome indicators.
- Expansion of the structure of the RIETI/EBPM Center based on the 6th Mid-term Objectives and Mid-term Plan.
- Consideration of data openness to expand the base of EBPM human resources for economic and industrial policy.

【Maintenance of data】

- Further simplification and acceleration of procedures to use questionnaire information in official statistics.
- Organization of the structure and format of data published by various ministries and departments so that the data can be used for policy planning, monitoring, and effectiveness verification across ministries and departments.
- Acceleration of the utilization of text data held within the Ministry.
- Establishment of a system and environment that enables the publication of monitoring indicators of policy effectiveness and progress.

【Digitalization in operations and administrative procedures】

- Promotion of the online access to administrative procedures at the Ministry of Economy, Trade and Industry by the end of 2025.
- Promotion of the introduction and utilization of a generative AI utilization environment at the ministry to promote operational efficiency and policy-making sophistication.

【Improve staff literacy】

- Examination of expanding a training program for staff to improve literacy on data and EBPM.
- Examination of effective training to improve the necessary literacy regarding generative AI and data analysis.