[Tentative translation]

Integrated Innovation Strategy 2025

June 6, 2025

Cabinet decision

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1. Basic Concept

- The Integrated Innovation Strategy 2025 (hereinafter referred to as "Integrated Strategy 2025") is an annual strategy in its fifth year positioned as an implementation plan of the Sixth Basic Plan for Science, Technology and Innovation (Cabinet decision of March 26, 2021; hereinafter referred to as the "Sixth STI Basic Plan"), and it is also an important strategy with a view to the Seventh STI Basic Plan.
- Science, technology and innovation are the source of national power and the driving force that accelerates economic growth and solves social issues. Rapid progress in science and technology has led to rapid social implementation of the results of basic research. For example, the impact of science and technology on the world is expanding as low-cost, small-scale, high-performance AI models emerge. In addition, some emerging technologies are expected to be implemented in society and could influence the balance of power in the international community in the future. As the global security environment becomes increasingly severe, the struggle for leadership over key technologies is becoming more intense, and it is important to strengthen Japan's international competitiveness.
- In Japan, as manpower shortage worsens, there is an urgent need to improve productivity through automation and labor saving by means of AI and robotics. In addition, the role of science, technology and innovation has become even more important as the need to prepare for and respond to the frequent occurrence of disasters has become a pressing issue.
- The Integrated Strategy 2025 will further accelerate efforts in the three key areas of "strategic promotion of advanced science and technology," "enhancement of knowledge bases (research capabilities) and human resource development," and "creation of innovation ecosystems" as the final stage of the Sixth STI Basic Plan. In addition, based on the discussions for the Seventh STI Basic Plan, the Government will also take action to strengthen coordination with the economy and security, strengthen the research base such as universities, and promote R&D investment in key technology areas, in order to address issues that should be initiated as soon as possible.
- In order to realize Society 5.0, we will steadily grasp and evaluate the progress of the Sixth STI Basic Plan, continuously grasp and analyze changes in the situation and latest trends in Japan and overseas using e-CSTI, etc., and reflect these research conclusions in science, technology and innovation policies to promote measures efficiently and effectively.

2. Promotion of Initiatives as the Final Stage of the 6th Basic Plan

（1） Strategic Promotion of Advanced Science and Technologies

① Strategic Promotion of Key Fields

(Promoting innovation while mitigating risks)

- Artificial intelligence (AI) can contribute to solving various social issues such as a declining birthrate and aging population, population decline in rural areas, and aging infrastructure. However, it also poses various risks, such as the proliferation of disinformation and

misinformation, increasing sophistication of crimes, prejudice such as gender discrimination, and misuse in personnel evaluation, etc. Given the rapid advancement of AI, it is necessary to promote innovation while mitigating risks based on the principles of human-centeredness, respect for human rights, and compliance with laws and regulations. In addition, international cooperation is also indispensable, as AI is being researched, developed, and utilized across national borders.

- From this perspective, with a view to establishing an Artificial Intelligence Strategic Headquarters under the Act on Promotion of Research and Development, and Utilization of Artificial Intelligence-related Technology (Act No. 53 of 2025; hereinafter referred to as the "AI Act") and the associated necessary secretariat system, as well as formulating an AI Basic Plan, taking into account trends in AI research, development, and utilization. In addition, with the spread of agent AI and the possibility of realizing Artificial General Intelligence (AGI), research will be promoted on safe cooperation between humans and AI, and responsibility in case of accidents, etc., as well as governance regarding rapidly changing technology (governance through agile PDCA cycles, etc.), and governance shall be realized through the AI Act and other laws and guidelines, etc.

(Promotion of Research and Development of AI, etc.)

- With AI, each process from basic research to social implementation is interrelated and progresses simultaneously, and therefore, the promotion of research and development, etc. should be conducted with a bird's-eye view of the entire process.
- We will accelerate AI for Science by strengthening the infrastructure for scientific research data generation, platform and develop and operate a new flagship system of supercomputers, which will have excellent AI performance, with the aim of starting operation by approximately 2030.
- We will promote efforts to achieve both high performance and low power consumption of AI semiconductors, etc., and develop an environment that enables the use of these AI semiconductors in a highly efficient and convenient manner.
- We will support startups, etc. with innovative technologies by promoting R&D in industry and academia for high-performance and multimodal AI models, physical AI such as AI robots, and general-purpose foundation models toward the future.
- Particularly for AI robots, we will promote R&D and implementation of general-purpose AI robots and their infrastructure, etc. in the public and private sectors and accelerate the construction of learning environments for the development of foundation models of AI robots and GPU environments for synthetic data generation, AI simulation, and virtual space generation for learning.

(Promotion of Development and Shared use of AI-related Facilities, etc.)

- In order to strengthen competitiveness, it is important for a wide range of developers to have access to computational resources, datasets, etc., which are indispensable for AI development,

and we will promote the upgrading and efficiency of computational resources and the development and shared use of research data platform, etc. in the public and private sectors.

- We will accelerate the development of data centers by effectively collaboration electricity and telecommunications (Watt-Bit collaboration) through the development of efficient power and telecommunications infrastructure.
- We will promote research and development and international standardization of next-generation information and communications infrastructure (Beyond 5G), including all-photonics network and mobile networks, as well as social implementation and overseas expansion through the establishment and utilization of testbeds.
- We will develop and expand high-quality Japanese language data that will help improve the performance of generative AI and provide it to companies and other organizations in an appropriate way. We will also promote the development and evaluation of Trustworthy AI that takes into account Japanese culture and customs, with an eye toward use by the national and local governments. In addition, we will promote multimodal data provision and sharing of good practices for competitive AI development in various fields.

(Promotion of AI Utilization)

- We will promote the use of AI in the public and private sectors in order to promote its use in key fields and solve social issues.
- We will promote the use of AI in critical fields such as medical/healthcare, robotics, factories/plants, infrastructure/disaster prevention, security, and government/municipalities, as well as in fields with serious labor shortages such as long-term care and agriculture, forestry, and fishery. In addition, we will also promote regional development through these efforts.
- We will examine the regulations on obtaining consent from data subjects in the development of AI etc., in cases where the use of personal data can be categorized as generating statistics, and how to ensure compliance with regulations through administrative fines etc. We aim to submit a bill to amend the Act on the Protection of Personal Information (Act No. 57 of 2003) to the Diet as soon as possible.
- We will promote the study of the assignment of responsibility in AI, and consider promoting the development and introduction of agent AI and other high-performance AI in the private sector, as well as introduction in Government.
- Based on the Guideline for Japanese Governments' Procurements and Utilizations of Generative AI for the Sake of Evolution and Innovation of Public Administration (Council for the Promotion of a Digital Society Executive Board Meeting decision of May 27, 2025), we will promote appropriate procurement and utilization of AI by the Government and sharing of knowledge gained.
- To promote the full-scale introduction of AI in local regions, we will increase the number of opportunities and examples (such as the AI Hokkaido Conference) to promote the demonstration and introduction of AI with the participation of local governments and companies and promote dissemination and publicity.

(Ensuring the Appropriateness of AI)

- In order to ensure the appropriateness of AI development and utilization, the Government has been developing guidelines in accordance with the Hiroshima AI Process, etc., to encourage voluntary efforts by business operators, etc., and publicize and spread awareness of existing laws, regulations, guidelines, etc.
- We will advance research and development of safety, including technologies to enhance AI security, in collaboration with the public and private sectors. The AI Safety Institute (hereinafter referred to as "AISI"), as a central organization for AI safety, will secure and train expert personnel, develop verification tools, and conduct research and analysis of AI security, with the cooperation of relevant ministries, agencies, and organizations.
- In response to dis/mis-information etc. in the Internet, including dis/mis-information stemming from generative AI, we will comprehensively promote development support for technologies to identify AI-generated content, improvement of user literacy, and institutional measures, while also taking into account international trends.
- We will promote public awareness and education based on Intellectual Property Right Study Group in the AI era "Interim Report" and the "General Understanding on AI and Copyright in Japan" published by the Legal Subcommittee under the Copyright Subdivision of the Cultural Council.
- We will establish a Chief AI Officer (CAIO) in each ministry and set up a mechanism to appropriately manage risks for the entire Government, while the Digital Agency will track the status of each ministry or agency's utilization of generative AI.

(Securing AI-related Human Resources and Promoting Education, etc.)

- We will work on promoting education to disseminate the necessary knowledge to the public so that they can widely enjoy the benefits of AI, while securing human resources with various cross-sectional knowledge, such as technical knowledge of AI, knowledge of ethics and governance, and so on.
- We will establish an industry-academia-government network and a system of close collaboration among universities, research institutions, etc. to foster young researchers, including engineers and students, for the development of next-generation semiconductors, AI, etc., and to ensure the transparency, reliability, etc. of the AI model.
- We will promote the securing and development of Workforce with AI skills, etc., and the accumulation and visualization of skill information of individuals. In addition, we will promote the development of data management talent who are responsible for data maintenance within organizations.
- The Government will promote activities to create usable AI through collaboration among users, vendors, and engineers in various regions and industries by supporting the operation of communities and holding contests.

- The Government will enhance and disseminate educational content for AI skill acquisition and AI literacy improvement.
- We will promote the dissemination of the "Guideline for the Use of Generative AI in Primary and Secondary Education", and promote empirical approaches to the utilization of generative AI, including information ethics.

(Research and Study on AI, etc.)

- In order to grasp rapid technological development and utilization, etc., we will conduct actual status research and information sharing, etc., on outstanding examples of research and development and utilization by businesses, etc.
- The Government shall regularly gather information on safety measures by Big Tech and the actual status of AI utilization in key industries, infrastructures, etc. In addition, in fields where AI utilization has a significant social impact, such as medicine, automated driving, finance, etc., we will consider reviewing the system, etc., as necessary, based on the progress and use of the technology.
- In cases where the rights and interests of citizens are infringed by the development and utilization of AI for wrongful purposes or in inappropriate ways, etc., the Government shall analyze and consider countermeasures, and take necessary measures such as providing guidance, advice, and information to the public.

(Promotion of International Cooperation in the Field of AI)

- Since research and development as well as utilization of AI transcend national borders, it is important to ensure interoperability between the world's and Japan's norms, and we will promote international collaboration and lead discussions on the formulation of international norms through collaboration among industry, academia, and government.
- In order to further advance the Hiroshima AI Process, we will utilize the Friends Group, with support from organizations including AI developers and strengthen cooperation with developing countries, with a view to advancing Japan's AI ecosystem. At the same time, we will promote the implementation of the International Code of Conduct and lead discussions on policymaking in AI governance.
- We will support AI capacity building, while taking into account the principles of human security through an international cooperation approach.
- We will support project-based efforts that contribute to promotion of the Hiroshima AI Process through GPAI (the Global Partnership for Artificial Intelligence) Tokyo Expert Support Center, etc.
- The AISI will harmonize measures to ensure the safety of AI through an international network between the AISI of Japan and AISIs of other countries, etc., and establish a system necessary for this purpose.

- We will participate in international standardization activities of ISO/IEC JTC1 in the field of AI and contribute to the development of international standards related to AI, including certification standards.
- We will develop a strong collaborative development system with the United States and other like-minded countries and regions and closely cooperate with universities and national research and development agencies (hereinafter referred to as "Kokken") to strengthen the industry-academia collaboration system utilizing their potential. In addition, while utilizing the Economic Research Institute for ASEAN and East Asia (ERIA), we will promote the sharing of know-how among AI developers and exchanges with global tech companies in the public and private sectors to create a cooperation model with the Global South in particular.

(Quantum Technology)

- The situation surrounding Japan is changing drastically, as countries are formulating national strategies and promoting international collaboration against the backdrop of the remarkable progress of quantum technology. Based on the "Promotion Measures for the Development of a Quantum Ecosystem (Expert Panel on Quantum Technology Innovation decision of May 30, 2025)," we will respond to changes in the situation toward practical application and industrialization in Japan and abroad.
- The year 2025 is positioned as the "First Year of Quantum Industrialization," and industry, academia, and Government will work together to maintain Japan's technological superiority in quantum technology and accelerate efforts to create a market, aiming for a Quantum-Ready Japan that is ready to utilize quantum technology in society.
- We will steadily engage in basic and applied research on quantum technology and promote the integration of quantum technology and fundamental technology (AI technology, classical computing infrastructure, etc.). In addition, we will strengthen global supply chains, promote international standardization activities, develop verification environments for quantum computing resources, quantum cryptography communications, etc., and promote the creation of practical use cases in other fields such as biotechnology and materials, and the creation of startups and new businesses.
- We will further promote the conclusion of memorandums of understanding for cooperation with like-minded countries and steadily build and expand cooperative relationships in the international field of quantum technology.
- In addition, to develop and secure human resources in the quantum field, we will develop and secure world-class research human resources, develop specialized human resources who will lead industrialization, and educate young people who will lead the future through sending doctoral students and young researchers overseas, science schools, and other programs. In addition, we will make efforts to strengthen the research systems of universities and other institutions that explore the basic science of quantum, and to create opportunities for global development and collaboration between industry and academia through intergovernmental cooperation and other means.

- In addition, with a view to the early industrialization of quantum technology, we have been working on the development of core technologies for quantum computers at the Institute of Physical and Chemical Research (RIKEN), the establishment of a quantum computer industry ecosystem using the Global Research and Development Center for Business by Quantum-AI technology (G-QuAT) established in July 2023 at the National Institute of Advanced Industrial Science and Technology (AIST), creating further use cases by expanding and enhancing the quantum cryptography communications testbed at the National Institute of Information and Communications Technology (NICT), and promoting the utilization of the testbed environment for quantum sensors and other devices at the National Institute of Quantum Science and Technology (QST).

(Fusion Energy)

- Fusion energy is expected to be the next generation of clean energy. In addition, private investment in fusion energy is increasing in many countries, partly due to ITER, an international project, and partly due to progress in government-led initiatives in the U.S. and other countries. While other countries are making large-scale investments and strengthening the retention of technologies and human resources in their countries as a national policy, we will promote efforts based on the "Fusion Energy Innovation Strategy (Integrated Innovation Strategy Promotion Council decision of June 4, 2025)" to prevent the leakage of Japanese technologies and human resources overseas and to contribute to security policies, including those related to energy. In particular, from the perspective of clarifying the commitment of the nation, we will aim for the early realization of fusion energy by, for example, preparing a timetable including necessary public and private sector initiatives to achieve a world-leading power generation demonstration ahead of the rest of the world in the 2030s.
- In order to enhance the predictability of the private sector and academia, we will fully utilize the knowledge and emerging technologies acquired through ITER project/BA activities, while taking into account the ambitious power generation target period set by startups in the U.S., U.K., etc., and objectively and cross-sectionally evaluating the technology maturity of the DEMO reactor project and power generation demonstration plan by domestic startups, we will formulate a roadmap based on backcasting. In addition to the evaluation of current technology maturity, a task force will be established in the Cabinet Office to discuss the path from technology development to commercialization, the cost of future fusion devices, smooth technology transfer measures, how to proceed with site selection, and the nature of the implementation entity.
- In order to accelerate the development of infrastructure for the realization of the DEMO reactor, we will strengthen research capabilities through industry-academia-government collaboration, and reinforce the QST and other organizations, in cooperation with other national research and development agencies, to develop a system that brings together academia and private companies to conduct technology development, and test facilities and equipment for full-scale technology development that can be used for startups. In addition, while research and development of various types of confinement methods such as tokamak, helical, Field-Reversed Configuration,

mirror, and inertial confinement methods such as laser are underway, we will collaborate with the Japan Fusion Energy Council (J-Fusion), which was established in March 2024, and other industrial organizations to promote efforts to build an ecosystem for the development of supply chains and the promotion of investment by actively participating in the global supply chain competition, strategically leading international standardization, and demonstrating various social applications for small power sources, etc. In addition, with an eye on the revision of the ITER project baseline, we will steadily acquire various knowledge through ITER project/BA activities, including increasing the number of Japanese staff in the ITER Organization, and return the outcomes to Japan, while also taking into account the Japan-US Joint Statement and Japan-EU Joint Press Statement, as well as strengthening multilateral and bilateral cooperation. Furthermore, in order to promote the participation of the private sector and DEMO development, we will promote initiatives based on the Basic Concepts for Ensuring Safety toward Realization of Fusion Energy decided in March 2025, in cooperation with related academic societies and like-minded countries such as the G7. In addition, in order to strategically develop human resources for DEMO development and other fusion energy projects, we will establish a systematic human resource development system through inter-university and international collaboration, and foster public understanding through risk communication in an integrated manner.

(Material)

- Materials are not only a cross-disciplinary fundamental technology, but also an important element in leading innovation by bringing about dramatic technological progress in a wide range of fields such as AI, biotechnology, quantum, semiconductors, batteries, and others. Based on the Materials Innovation Strategy (Integrated Innovation Strategy Promotion Council decision of June 4, 2025), we will continuously create materials innovation through the establishment of a knowledge value chain, continue to win in the materials industry, which is Japan's core industry, and respond to various social issues that are becoming more complex.
- Specifically, we will focus on research and development of high-performance and high-valued materials, materials that are keys to supply-chain resilience and resource security through the realization of a circular economy, green materials, energy-related materials, etc., support for the introduction of facilities, and the formation of international rules. In addition, we will engage in research and development of materials that create new value and can be defined as "frontier" ones.
- To accelerate materials innovation, we will further promote materials DX through automatic/autonomous experiment systems integrated with AI and robotics. We will expand the materials data infrastructure, encourage its utilization, and promote the creation of results through data-driven R&D. To create innovation by bridging "knowledge," we will promote collaboration among diverse stakeholders, which is one of Japan's strengths, and build an ecosystem for fostering startups in the materials field.

- We will promote basic and fundamental research, human resource development, and the development of research infrastructure such as cutting-edge shared facilities, in order to continuously create materials innovation.

(Biotechnology)

- Based on the Bioeconomy Strategy (Integrated Innovation Strategy Promotion Council decision of June 3, 2024), we will promote the creation of a bioeconomy market.
- Specifically, in the five markets of "biomanufacturing and bio-derived products," "sustainable primary production systems," "large-scale timber construction and smart forestry," "biopharmaceuticals, regenerative medicine, cell therapy, and gene therapy-related industries," and "lifestyle-enhancing healthcare and digital health," industry, academia, government, and financial institutions will work together to accelerate the development of technologies such as synthetic biology and AI, improve the market and business environment, and strategically utilize international standards. In addition, the Government will promote human resource development to support life science research, which will be the source of bioeconomy expansion, promote basic life sciences such as life course-focused research, develop and improve next-generation information research infrastructure such as databases, bioresources, and biobanks, and promote data-driven research using these infrastructures.
- To strengthen the startup ecosystem in the biotech field, we will promote industry, academia, government, and financial institutions collaboration in the bio-community.

(Formation of a Digital Society)

- The formation of a digital society based on a digital twin that utilizes advanced science and technology and a diverse and massive amount of data will be the foundation for the realization of Society 5.0. Under the Priority Plan for the Advancement of a Digital Society (Cabinet decision of June 21, 2024; to be revised by the middle of 2025), the Government will promote the use of AI in public administration, regional development that thoroughly utilizes digital and new technologies, and the construction of an environment that makes use of data. At the same time, we will promote the review of analog regulations that hinder the implementation of digital and new technologies in society, by following the Roadmap for the revising analog regulations based on Digital Principles, and promoting the review of ordinances and other regulations by local governments, as well as promote the dissemination of information for the implementation of digital technologies by using tools such as Technology Map and Technology Catalog. In addition, we will make efforts to disseminate information on the implementation of digital technologies through the use of technology maps, technology catalogs, etc. In addition, to promote data linkage, under public-private partnerships, we will make efforts to create use cases, clarify common functions related to data linkage, and avoid duplicate investment. We will continue to promote developing a base registry and digitizing semi-public sectors such as education, healthcare, and disaster prevention, while securing trust and developing standards and specifications related to data as a foundation for Data Free Flow with Trust ("DFFT"). In

addition, we will further promote initiatives related to DFFT, such as implementation of projects to address challenges associated with transferring data across borders under the international framework endorsed at the G7 Digital and Tech Ministers' Meeting in Gunma-Takasaki and the G7 Hiroshima Summit. In addition, we will promote initiatives such as the Ouranos Ecosystem for sharing and utilizing data across the borders between enterprises and industries, and national boundaries. Furthermore, based on the Digital Lifeline Development Plan, we will expand the implementation of UAS (Unmanned Aircraft Systems) Lines and CAV (Connected Autonomous Vehicles) corridors, and we will also advance studies in leading municipalities on methods for managing data related to underground utilities as part of the digital transformation of infrastructure management.

(Digital Social Infrastructure)

- In the area of semiconductors, a strategic fundamental technology, we will accelerate efforts to improve the R&D system and human resource development infrastructure in industry and academia, and to secure the industrial base. In addition, as digital infrastructure to support an AI society, based on the Digital Infrastructure Development Plan 2030 to be formulated in June 2025, we will accelerate the development of the usage environment for 5G, optical fiber, and non-terrestrial networks (NTN), etc., as well as promote the decentralization of data centers through the effective coordination of electricity and communications (watt-bit coordination) and integrated development of international submarine cables, etc. We will also promote social implementation and overseas deployment through R&D, international standardization, testbed development and utilization, etc., toward the full introduction around 2030 of a low latency, highly reliable, low power consumption next-generation information and communication infrastructure (Beyond 5G) centering on all optical network technologies.

(Healthcare and Medicine)

- Based on the Healthcare Policy (Cabinet decision of February 18, 2025) and the Plan for Promotion of Medical Research and Development (Headquarters for Healthcare Policy decision of February 18, 2025), etc., the following initiatives will be promoted.
- With the aim of restoring Japan's drug discovery capabilities, we will promote the development of a biopharmaceutical production system, an internationally competitive system capable of conducting FIH studies (first-in-human studies), and an investigational drug manufacturing facility, and work to realize an international-level R&D environment in which technological seeds are rapidly put to practical use.
- We will comprehensively promote R&D focusing on the life course in order to realize a society in which all ages are healthy. Specifically, we will conduct research and development to create seeds for the creation of "intergenerational" life phenomena, such as the interaction between parents and children in early life stages; research and development to create innovative diagnosis, treatment, and drug discovery for cranial nerve diseases and psychiatric disorders to overcome social issues such as dementia and depression; basic research to create seeds for regenerative

medicine, cell medicine, and gene therapy using iPS cells and organoids, and their application to drug development, as well as promote cancer research with an awareness of social implementation based on the Fifth Ten-Year Strategy for Cancer Research. We will promote the development of an environment in which healthcare and medical information, lifelog data, and other PHRs can be organically linked, and the spread of online medical care and telemedicine.

- In order to support cutting-edge research, we will promote the maintenance, upgrading, and sharing of next-generation information infrastructure such as databases, biobanks, and bioresources, as well as advanced equipment, through a stable system, and promote data-driven research utilizing omics data, including genome data, clinical information, etc. to realize next-generation medicine.
- In order to prepare for infectious disease crises, we will formulate and review development strategies for medical countermeasures such as vaccines, diagnostics, and therapeutics, and strategically promote research and development and conduct related simulations and training. In addition, from the perspective of creating new scientific knowledge on infectious diseases and the One Health approach, we will establish an environment that enables the execution of research, development, and commercialization of medical countermeasures including those for antimicrobial resistance.
- To capture the global market for Japan's medical device industry, the Government will promote innovation creation and commercialization through collaboration between startups and companies that are responsible for global expansion, promotion of initiatives with a view to expanding into the U.S. and other markets from an early stage, and strengthening of support for clinical trials.
- We will promote research and development of medical devices, including software as a medical device (SaMD), and support clinical research and other activities aimed at practical application by startups and other companies.
- In order to improve the productivity of long-term care, we will promote the development and diffusion of long-term care technology and support its social implementation.
- In FY2025, we will establish an organization to conduct whole genome analysis of cancer and intractable diseases, and steadily promote the return of the results to patients and the development of an information infrastructure, as well as formulate a basic plan based on the Act on the Comprehensive and Systematic Promotion of Measures for Ensuring Public Access to Quality and Appropriate Genomic Medicine (Act No. 57 of 2023; “Genomic Medicine Promotion Act”).
- In addition to promoting the establishment of a domestic manufacturing system for regenerative medical products for use in regenerative medicine, cell therapy, gene therapy, etc., and biopharmaceuticals such as antibody drugs, etc., we will also work to involve domestic equipment and component material-related industries, develop manufacturing-related human resources, and integrate developed products both domestically and internationally.

- We will support the global development of pharmaceutical startups through Strengthening Program for Pharmaceutical Startup Ecosystem to create a circulation of funds and human resources and raise the level of Japan's pharmaceutical startup ecosystem.
- We will identify the issues of pharmaceutical startup that are in the late stages of clinical trials and require large amounts of development funds but have difficulty raising additional funds, and address necessary measures such as attracting overseas investors and horizontal development of good practices.

(Securing Space Security)

- In order to realize space security through the three approaches outlined in the Space Security Initiative (National Space Policy Secretariat decision of June 13, 2023), which Japan newly formulated in June 2023, "radically expand the use of space systems for national security," "ensuring safe and stable use of outer space," and "realization of a virtuous cycle of security and fostering space industrial base," it is necessary to establish the necessary space architecture for security at an early stage, including the establishment of a wide-area, high-precision, and high-frequency information collection system, including the strengthening of the functions of information-gathering satellites, the establishment of an information and communications system with high interception and jamming resistance, responses to missile threats, and the enhancement and strengthening of the understanding of the space domain.
- In recent years, the innovation and commercialization of space technology by private companies has been progressing rapidly. It is important to promote the development of the domestic space industry by actively utilizing private space technology and capabilities for Japan's defense, thereby realizing a virtuous cycle that will lead to the strengthening of Japan's defense capabilities.

(National Resilience, Responding to Global Issues and Realizing Innovation)

- During the 2024 the Noto Peninsula earthquake and torrential rains, images taken by the Large Synthetic Aperture Radar (SAR) satellite Daichi-2, information-gathering satellites, and satellites operated by private companies in Japan were used to assess the damage caused by landslides and other disasters.
- The effectiveness of SAR satellites in strengthening disaster response measures and assessing damage has also been demonstrated in the Noto Peninsula earthquake response. In addition, in the case of the forest fire in Ofunato City, Iwate Prefecture, which occurred in February 2025, images taken by information gathering satellites and other domestic and foreign satellites were used to assess the spread of the fire.
- The space system should be used to solve global issues and contribute to the creation of innovation in regional revitalization and private market sectors, such as addressing the increasingly serious problem of climate change, achieving carbon neutrality and automated driving, creating smart cities through the construction of urban digital twins, and smart agriculture, forestry, and fisheries.

- At the 3rd Ministerial Meeting of the Task Force on the Use of Satellite Remote Sensing Data (March 26, 2024), the Government decided to expand the use of private satellites for three years from FY2024, and in particular, to actively procure and use satellite data provided by domestic startups with technological capabilities in relevant ministries and agencies. In the future, it will be important for the public and private sectors to work together to promote strategic technology development and demonstrations, and for the Government to take the lead in promoting service procurement by private companies in order to expand the use of satellite data.

(Creation of New Knowledge and Industry in Space science and Exploration)

- In addition to the United States, emerging countries including China and India are accelerating efforts to explore the Moon, and international competition is intensifying. In the Japan-U.S. Joint Leaders' Statement (February 7, 2025), it was confirmed that the two countries intend to continue their strong partnership in human exploration, including lunar exploration on future Artemis missions. Based on the Implementing Arrangement concerning Lunar Surface Exploration using the Pressurized Rover (April 2024), the Artemis program plans to allocate two astronaut flight opportunities to the lunar surface for Japan to land in addition to the provision and operation of a manned pressurized rover from Japan. Japan will promote the development of the manned pressurized rover and aim to realize a lunar landing by a Japanese astronaut in the late 2020s. In January 2024, the Smart Lander for Investigating Moon (SLIM) of the Japan Aerospace Exploration Agency (JAXA) succeeded in the world's most precise pinpoint lunar landing. Industry, academia, and the Government will continue to collaborate to maintain and develop achievements in space science and exploration, with a view to contributing to the Artemis program.
- In light of efforts toward the transition from the current International Space Station (hereinafter referred to as "ISS") to a commercial space station due to the retirement of the ISS in around 2030, we will promptly make preparations to enhance and strengthen Japan's low earth orbit activities and to maximize their results. In addition, as activities to prevent disasters caused by collisions with celestial bodies such as asteroids, such as the closest approach of the asteroid Apophis to the Earth in 2029, are attracting attention, we will work in cooperation with space agencies of other countries.
- In addition, through the dissemination of information and results of space science and exploration, we will promote public understanding of space development and utilization, and will foster future human resources who will support space development and utilization, and enhance the international presence of space development and utilization.

(Strengthening the Comprehensive Foundation for Supporting Space Activities)

- The launch of the second H3 test rocket in February 2024 was a success, followed by the steady success of the third, fourth, and fifth H3 rockets. In order to maintain independent space activities, a space transportation system that enables high-frequency launches by the public and private sectors, greater transportation capacity, and lower launch costs are necessary. In addition,

it is important to build up a track record of success by supporting rocket technology development by the private sector and securing initial demand, and to promote procurement of transportation services by the Government. In addition, it is important to support the development of launch sites and spaceports that will serve as bases for launch vehicles, while taking into account the perspective of regional vitalization. It is necessary to promptly develop the necessary institutional environment for manned space activities and other various space activities, including suborbital flights, re-entry from Earth orbit, and in-orbit service satellites, strengthening the international competitiveness of Japan's space industry, and ensuring the safety and reliability of Japan's space activities.

- The risk of collisions between space objects is increasing due to the increase of space debris and the full-scale introduction of large-scale satellite constellations, and the importance of international rulemaking at the United Nations and other international fora is growing. In Japan, efforts have been steadily made to make technological development and rule-making "two wheels of a cart", including the establishment of the Guidelines for Collision Avoidance with Satellites, etc. We will continue to contribute to the sustainable, stable, and safe utilization of outer space by steadily promoting technological development that contributes to the reduction and removal of space debris, as well as by promoting efforts in line with the Mid- to Long-term Policy on Efforts for Rule-Making on the Use of Earth Orbit and by taking the initiative in international norms and rule-making.
- The Space Technology Strategy (Space Policy Commission, March 25, 2025), which indicates the technologies to be developed and the timeline for their development with a view to Japan's winning strategy, has been revised based on the latest status of global trends, user needs, and the implementation of technology development. Referring to this strategy, related ministries and agencies will continue to strategically promote technology development from technology development to raise the technological maturity level (front-loading) to business development and commercialization in order to strengthen Japan's technological superiority and ensure the autonomy of the supply chain.
- In particular, with regard to the Space Strategy Fund, we have decided on the selected projects for all technology development themes (Phase 1) to be implemented using the FY2023 supplementary budget, and have started to support them in turn. We have also decided on the technology development themes (Phase 2) to be implemented using the FY2024 supplementary budget, and have begun public solicitation of potential projects. We will continue to support the expansion of space activities of private enterprises and universities, aiming to promptly provide one trillion yen worth of support.
- In addition, by linking the results of this technological development support to medium- and long-term anchor tenancy by the Government, etc., a virtuous circle will be created for commercialization by Japanese private companies that have the technology, business model, and the will to survive in the international market.

- In implementing projects of the Government and other entities, we will review the contracting system in consideration of the national interest so that business and growth potential can be secured for the business entities.

(Oceans)

- The following efforts will be made with regard to the four key missions that are particularly relevant to the Science, Technology and Innovation Policy in the Ocean Development Strategy (Headquarters for Ocean Policy decision of April 26, 2024), which consists of six key missions to be undertaken across ministries and agencies from the perspective of national interest.
- With regard to the Promotion of the Development and Utilization of Autonomous Underwater Vehicles (AUVs), in order to contribute to manpower saving and productivity improvement in the maritime field, we will continue the demonstration project in FY2025 to demonstrate the effectiveness of AUVs and identify issues at sites where AUVs are expected to be used, and will also discuss to enhance systems and business environment through the AUV public-private platform to promote the utilization of AUVs.
- With regard to the Promotion of Maritime Domain Awareness (MDA) and Utilization of Information, in order to strengthen the capacity of MDA and promote the utilization of marine information, we will promote the dissemination of and awareness-raising for MSIL to enhance the information and create a test content of the MSIL Business Platform. We will conduct surveys and studies to solve various ocean-related issues by utilizing satellite data, AI, and other technologies. Furthermore, in order to promote international cooperation related to MDA, we will work effectively with ally and like-minded countries.
- In order to contribute to these important missions, we will promote global ocean observation and surveys of the deep sea and ocean trench areas, as well as build digital twins of the ocean, which will be linked to MSIL.
- With regard to the “Promotion of the Development of Minami-Torishima Island and its Surrounding Sea Areas as One of the Remote Territorial Islands,” we will promote technological development of rare earth production and examination of social implementation plans in the third phase of the Strategic Innovation Promotion Program (hereinafter referred to as "SIP"), "Building a Marine Security Platform," and continue to collect and organize basic information on Minami-Torishima Island.
- With regard to the Promotion of International Cooperation in Arctic Policy, based on the research conducted in FY2024 to collect and analyze information on the Arctic policies of various countries, we will hold an international symposium and workshop in FY2025 to promote understanding of Japan's Arctic policy and to strengthen collaboration with related countries. In addition, we will make efforts to utilize Arctic Research Vessel (ARV) *Mirai II* as an international research platform by steadily constructing the ARV *Mirai II* to be put into service in the autumn of 2026, and implementing the Arctic Challenge for Sustainability Ⅲ Project (ArCS III).

(Food, Agriculture, Forestry and Fisheries)

- Based on the Basic Plan for Food, Agriculture and Rural Areas (Cabinet decision of April 11, 2025), the Government will promote research and development to ensure food security in Japan, sustainable development of agriculture, forestry and fisheries, and the establishment of environmentally harmonized food systems. Specifically, we will promote the development and introduction of smart agriculture, forestry, and fisheries technologies that utilize new technologies such as AI. In addition, through industry-academia-government collaboration, we will promote the development and dissemination of new varieties of crops that improve productivity and respond to climate change, etc., by utilizing advanced technologies such as genome analysis, etc. Furthermore, in order to enhance both productivity and sustainability in the agriculture, forestry, and fisheries, and the food industry through innovation, we will promote research and development to achieve the goals of carbon neutrality, reduction of chemical pesticide and fertilizer use, etc., based on the MIDORI Strategy for Sustainable Food Systems (MIDORI Strategy Headquarters decision of May 12, 2021). In addition, in order to strengthen Japan's research and development capabilities and to ensure rapid social implementation of the results, we will strengthen research infrastructure functions of the National Agriculture and Food Research Organization (NARO), promote open innovation through the accumulation and utilization of knowledge, provide startup support for rapid business development in accordance with growth stages, and strengthen strategic intellectual property management. At the same time, to contribute internationally and strengthen collaboration in the field of agriculture, forestry, and fisheries research, we will promote international joint research by the Japan International Research Center for Agricultural Science and the dissemination of its results and strengthen its functions as an international research center.

(Environment and Energy)

- The Green Transformation (hereinafter referred to as "GX"), which aims to simultaneously realize stable energy supply, economic growth, and decarbonization, with enhanced predictability under long-term goals, is essential to overcome global issues such as climate change. It is important to steadily promote technological development and innovation for the transformation of the economy and society toward the realization of a circulation and symbiosis based society. In doing so, it is also important to pay attention to the contribution to national security policy, the formation of an international market for the solution of social issues using advanced science and technology such as AI and materials, and the utilization and bridging of results including startups.
- In order to realize GX, we have formulated the "GX2040 Vision (Cabinet decision of February 18, 2025)" in the form of a revision of the "GX Promotion Strategy (Cabinet decision of July 28, 2023)," will continue to promote research, technology development, and science and technology diplomacy through the Green Innovation Fund Project, Green Technologies of Excellence (GteX) Program, etc., in cooperation with the international community. In the field of agriculture, forestry, and fisheries, the Midori GX Promotion Plan (tentative name) will be

formulated to promote the development of technologies to reduce environmental burden, Initiative for Net-zero compatible with Food security through INternational expansion of Japan's Innovative TechnologY (MIDORI∞INFINITY) will be compiled to promote overseas deployment of greenhouse gas emission reduction technologies contributing to food security.

- Based on the Strategic Energy Plan (Cabinet decision of February 18, 2025) which was revised in unison with the GX2040 Vision, etc., we will promote improvement of energy efficiency performance and maximum utilization of decarbonized power sources such as renewables and nuclear power. In addition, we will promote research and development, demonstration, standardization strategies, and international cooperation on innovative energy technologies such as next-generation semiconductors, next-generation renewable energy, and next-generation innovative reactors such as fusion energy.
- Based on the Basic Environment Plan (Cabinet decision of May 21, 2024), the Plan for Global Warming Countermeasures (Cabinet decision of February 18, 2025), the Fundamental Plan for Establishing a Sound Material-Cycle Society (Cabinet decision of August 2, 2024), Strategy for a Growth-Oriented, Resource-Autonomous Circular Economy (formulated by the Ministry of Economy, Trade and Industry on March 31, 2023), the National Biodiversity Strategy and Action Plan of Japan 2023-2030 (Cabinet decision of March 31, 2023), etc., we aim to realize a circulation and symbiosis based society by integrating "net zero (net zero greenhouse gas emissions)," "circular economy," and "nature positive," and other measures. To this end, we will promote the structural transformation of industry and society and the creation of demand through the creation of Decarbonization Leading Areas, the development and demonstration of technologies for decarbonization such as net-zero energy for housing and buildings, and national movement for new and prosperous lifestyles toward decarbonization (Decokatsu). We will promote research, technological development, and accumulation of observation data to realize nature positive through conservation and restoration of natural capital and mainstreaming of biodiversity. To realize a circular economy, we will promote recycling of useful resources and renewable energy-related products, construction and utilization of data infrastructure, and technological verification of carbon-recycling products and fuels, in order to realize resource circulation through the collaboration of arterial and venous industries. We will strategically utilize the results of each policy to promote international rule formation and international standardization.
- In addition, in the third phase of SIP, "Smart Energy Management Systems", "Development of Circular Economy System", etc., we will promote research and development in cross-disciplinary areas through industry-academia-government collaboration.

(Enhancement of Analytical Functions through the Use of an Evidence System (e-CSTI))

- In order to promote R&D in important fields, it is important to efficiently and effectively promote R&D by analyzing, based on objective data, R&D trends in Japan and overseas including the situation of distribution of funds in Japan, research papers and patent information.

- For this purpose, the Cabinet Office has been collecting and constructing data on research expenditures and publications of individual researchers at national universities and national research and development agencies in Japan and providing it to the Government, national universities, and national research and development agencies through e-CSTI. In addition, we are also developing tools for analyzing domestic and international R&D trends and conducting a bird's eye view analysis of key science and technology using these tools, with a view to utilizing these tools at the Strategic Institute for Critical Technologies (tentative name; a think tank for safety and security), which will be described later.
- We will continuously collect data and analyze the relationship between research inputs such as budget and outputs such as Top 10% papers, etc., and strengthen analysis of the supply chain of advanced science and technology, including overseas funding trends, in order to promote policy making (EBPM) and corporate management based on objective evidence (EBMgt).

② Promotion of R＆D on Key Technologies for Economic Security and Strengthening Research and Study Functions

- Japan will continue to support the R&D and practical application of important advanced technologies that are essential for Japan to continue to secure a solid position in the international community through the Key and Advanced Technology R&D through Cross Community Collaboration Program (K Program) and other programs. We will promote research and development of the technologies targeted for support in the R&D Vision of the K Program with support through the Public-Private Cooperation Council for a designated fund.
- We will establish the Strategic Institute for Critical Technologies (tentative name; a think tank for safety and security), which is also expected as an institute that conducts surveys and research based on the Act on the Promotion of Ensuring National Security through Integrated Implementation of Economic Measures (Act No. 43 of FY2022; “Economic Security Promotion Act”), by FY2026. As a part of efforts for the establishment, we will conduct a call for proposals. In addition, including the above, from a comprehensive perspective, we will establish a system to strengthen intelligence capabilities and think-tank functions that contribute to economic security.
- In order to provide research institutes and funding agencies that handle technologies important to Japan's economic security with a guideline for preventing the leakage of critical technologies when conducting international joint research, etc., based on the policies and actual status of research security and integrity of the G7 and other like-minded countries, etc., a study will be started at an expert panel to begin its operation during FY2026, and the guideline will be formulated by the end of FY2025. In addition, from the viewpoint of preventing technology leakage, we will continue to strengthen the system for investment screening and screening for the acceptance of international students and foreign researchers, etc. as well as to promote training programs for researchers to ensure research security and integrity in universities, etc.

(Active Use of Advanced Science and Technology in the Field of Security Based on National Security Strategy)

- Based on the National Security Strategy (National Security Council and Cabinet decision of December 16, 2022), in order to utilize the high technological capabilities of the public and private sectors of Japan in a broad and active manner for national security, we will enhance those technological capabilities of the public and private sectors that can be used for national security, and strengthen the whole-of-government mechanism for utilizing funds and information related to R&D, etc. Specifically, we will, following on FY2024, designate matching projects in FY2025, as we did in FY2024, to promote the R&D of science and technology that will contribute to the strengthening of the comprehensive defense architecture by matching the R&D needs based on the views of the Ministry of Defense with the technological seeds held by relevant ministries and agencies. Through active communication between the Ministry of Defense and the relevant ministries and agencies regarding the designated projects, the initiative seeks to efficiently identify and nurture those that have a high possibility of being linked to the R&D activities of the Ministry of Defense.

③ Promotion of R&D and Social Implementation through SIP, BRIDGE, Moonshot Research and Development Program, etc.

- In Japan, there is a growing labor shortage, and there is an urgent need to improve productivity through automation and labor-saving through AI and robotics. In order to implement technology in society, solve social issues, and create new value, it is important to utilize Convergence Knowledge (So-Go-Chi), including not only natural science but also humanities and social science. We will consider further promotion measures from the perspective of ensuring diversity in research activities and creating gender-neutral innovations.
- In order to implement science and technology in a concrete and strategic manner in society, we will promote 14 issues back-cast from the needs of solving social issues, from basic research to social implementation the third phase of the SIP. From the perspective of "Convergence Knowledge (So-Go-Chi)", the program will introduce five perspectives necessary for social implementation (technology, systems, business, social acceptability, and human resources), and will actively promote collaboration between issues by covering the humanities and social sciences in addition to the fields of science and technology. In addition, we will promote projects with concrete social implementation in mind, while keeping an eye on the stage-gate evaluation to be conducted in the third year of the third phase of the SIP (FY2025), while programs for Bridging the gap between R&d and the IDeal society (Society 5.0) and Generating Economic and social value (BRIDGE) and the SIP will be operated in an integrated manner to accelerate the social implementation of R&D results of each ministry, for example, by utilizing the BRIDGE.
- From the perspective of disaster prevention and mitigation, in light of the 2024 Noto Peninsula Earthquake, we will promote social implementation of new technologies, etc. that are found to be effective in disaster response, etc., in order to strengthen initial response and emergency measures in the future, while taking into consideration their utilization in normal times. In

addition, in the third phase of the SIP, "Development of a Resilient Smart Network System against Natural Disasters," we will develop disaster prediction simulation technology, etc. for risk prediction assuming the severity of disasters, taking into account the effects of climate change, by utilizing data integration infrastructure using a wide variety of sensing data such as small SAR satellites, systems utilizing disaster information IoT technology, earth observation and prediction data, etc. for rapid and detailed disaster information collection. We will also utilize AI, etc. to build a digital twin that enables effective disaster response and develop an information provision infrastructure, as well as engage in efficient and effective R&D investment and social implementation based on a holistic view of disaster prevention research. Under the Headquarters for Earthquake Research Promotion and the Headquarters for Volcano Research Promotion, we will promote the collection of land and sea area data, necessary research and study, development of observation and analysis systems, and human resource development.

- From the perspective of infrastructure resilience, in light of the fact that Japan's vast infrastructure and buildings are aging, we will work on technology development and R&D to realize efficient infrastructure management by conducting integrated management form design to construction, inspection, and repair using digital technology in the third phase of the SIP "Smart Infrastructure Management System." With the construction of a digital twin as the core of development, we will work on innovative construction production processes and the establishment of advanced infrastructure maintenance cycles, strategic utilization of human resources of local governments, etc., and technological development for creating attractive national land, cities, and regions through smart infrastructure.
- With regard to technology development for infrastructure facility maintenance and management, we will promote initiatives for sustainable infrastructure facility maintenance and management to keep and improve inspection levels, and to perform efficient work, using AI analysis of images acquired by drones, satellites, etc., such as continuously providing information on drone demonstration results at the project sites of the national government.
- With regard to the development of the MLIT Data Platform, we will further promote cooperation with data on national land, economic activities, and natural phenomena held by the national government, local governments, and private companies, and we will continue to develop use cases and improve usability and search functions in order to expand data utilization.
- In the Moonshot R&D Program that aims to create disruptive innovations originating in Japan, the fifth year after the start of research, the following goals will be evaluated based on guidelines for operation and evaluation and a decision will be made on whether to continue or terminate research: Goal 1 (overcoming limitations of body, brain, space, and time), Goal 2 (ultra-early disease prediction and intervention), Goal 3 (coevolution of AI and robots), Goal 6 (fault-tolerant universal quantum computer), and Goal 7 (to age 100 without health concerns). For Goal 8 (controlling and modifying the weather) and Goal 9 (increasing peace of mind and vitality), which are in their fourth year of research, we will review the portfolio based on the third-year evaluation, etc.

（2） Enhancement of Knowledge Bases (Research Capabilities) and Human Resource Development

① Strengthening Research Base through University Endowment Fund, the Promotion of Research Universities with a Regional Core and Distinctive Characteristics, and the strengthening of the Functions of Kokken

(Realization of World-Class Research Universities through the University Endowment Fund)

- We will work to improve research capabilities and create innovations through friendly international competition, acquire world-class researchers, foster independent young researchers who will lead the next generation, allocate resources boldly, reduce the burden in order to secure research time, support the development of university startups, and value intellectual resources through mediation of joint research and development, etc. We will also support Universities for International Research Excellence through the investment profits of the 10-trillion-yen University Endowment Fund in order to realize world-class research universities that can proceed in an integrated manner with the continuous securing and utilization of financial resources to build university's own endowment fund that will enable flexible upfront investment. In addition to the grant to Tohoku University, which has been recognized as a University for International Research Excellence, we will proceed with applications and screening for the second phase, with the aim of commencing the grant during FY2025.

(Promotion of Research Universities with a Regional Core and Distinctive Characteristics)

- As two wheels of the 10-trillion-yen University Endowment Fund, we will support initiatives to drive regional and social change through the Package for Comprehensive Promotion of Research Universities with a Regional Core and Distinctive Characteristics (Council for Science, Technology and Innovation decision of February 1, 2022; revised on February 8, 2023), so that ambitious and diverse universities can fully demonstrate their strengths and characteristics and pursue regional economic and social development, solutions to domestic and international issues, and diverse international expansion of research.
- Centered on 25 universities selected under the Multi-year Fund for Promotion of Regional Core and Distinctive Research Universities (J-PEAKS), we will support regional universities with strengths in specific fields to reform their management and strengthen their research capabilities so that they can produce results in a wide range of stages from basic research to social implementation.
- We will promote the establishment of a world-class international research center through the World Premier International Research Center Initiative (hereinafter referred to as "WPI"), the establishment of industry-academia-government collaboration centers that contribute to human resource development for social change while responding to regional needs through the Open Innovation Platforms for Industry-Academia Co-creation (COI-NEXT), and the formation of research networks across organizations and fields through the Promotion of Development of a Joint Usage/ Research System Project: Coalition of Universities for Research Excellence Program (CURE).

(Promotion of Initiatives to strengthen the Functions of Kokken)

- Kokken are expected to contribute through science, technology, and innovation to social issues and national challenges, such as natural disasters, in recent years, and we will organize the roles that they are expected to play and strengthen their functions.
- Based on the FY2023 agreement between the relevant ministries and agencies, Kokken will work to secure human resources by introducing a flexible personnel and salary system in cooperation and collaboration with other corporations, and will further strengthen research security and integrity.

(Realization of a Research Environment Conductive to Research)

- In order to realize an attractive research environment by global standards where researchers can sit back and devote themselves to research, we will promote improvements in the research environment, including securing research hours. In addition, along with the implementation of university governance reforms and personnel and salary management reforms, etc., while taking into account increases in personnel costs and prices, etc., we will secure national universities operating expense subsidies and basic expenses for Kokken. In order to encourage research themes that are not bound by existing research systems, we will improve the research environment by further strengthening research capabilities through competitive research funds such as Grants-in-Aid for Scientific Research ("KAKENHI"), supporting internationality and young researchers in KAKENHI, and supporting emergent research.

② Upgrading Research Facilities and Equipment, Promoting Open Science

(Promote the Development of Infrastructure to Support Research DX and the Sharing of Research Facilities and Equipment)

- In order to promote the enhancement of the system to strategically introduce, renew, and share research facilities as an organization as a whole in universities and research institutes (core facility development), we will promote centralized visualization of related information and collaboration among institutions. In addition, for medium-scale research facilities, we will promote focused support measures for facilities that contribute to efficient and effective utilization across organizational boundaries.
- Aiming to create the world's brightest synchrotron radiation facility with a brightness 100 times greater than that of the current SPring-8 large synchrotron radiation facility, we will promote the upgrade of SPring-8-II to be in public use in FY2029. In addition, we will take the necessary measures, such as the expansion of the shared beamlines of NanoTerasu Synchrotron Light Source, and the functional enhancement of J-PARC, Japan Proton Accelerator Research Complex, after evaluating their performance.
- To promote efficiency and speed through AI and data-driven research, we will move forward with the advancement of research digital infrastructure, such as the ultra-high-speed, high-

capacity network infrastructure (SINET) and nationwide research data infrastructure (NII Research Data Cloud).

- We will efficiently and steadily operate Fugaku, and promote its wide utilization. In addition, we will develop and operate a new flagship system of supercomputers with superior AI performance, and promote support for design and development of applications, human resource development, etc. with a view to generating results after the start of operation.

(Promotion of Open Access to Publicly Funded Scholarly Publications and Scientific Data)

- Based on the "National Policy on Promoting Open Access to Publicly Funded Scholarly Publications and Scientific Data (Integrated Innovation Strategy Promotion Council decision of February 16, 2024) ", we will promote supporting the establishment of an expanded university-based system for group negotiation with academic platformers, publishing scholarly publications and scientific data in information platforms such as institutional repositories, implementing intersystem federation, and developing and enhancing platforms for disseminating research outputs. Furthermore, in addition to quantitative indicators for research evaluation and assessment, we will promote consideration of measures for new evaluation and assessment and providing incentives.

(Promotion of Management and Utilization of Publicly Funded Research Data)

- We will examine leading initiatives of advanced data management in the Moonshot R&D Program, and will promote management and utilization of research data by promoting the data management in the third phase of the SIP, assigning metadata to publicly funded research data, formulating data policies and depositing research data into the institutional repositories in universities and other R&D institutions, and promoting international collaboration with G7 and other countries.

③ Strengthening Efforts by Industry, Academia, Government to Foster Creative and Diverse Human Resources, Enhance Education, and Promoting Active Participation

(Promotion and Creation of Opportunities and Doctoral Human Resources and Young Researchers, and Support for Students)

- To realize a society in which the next generation of doctoral candidates can work not only in academia but also in a variety of fields, such as startups, private companies, public institutions, international organizations, we will promote practical internships, provide career development and training content, foster, support, and promote the activities of R&D management personnel, and support the creation of startups, etc. to create diverse career paths. In addition, we will promote the reform of graduate schools, including the formation of world-class graduate school education centers and the internationalization of education and research, and improve the treatment of doctoral students and young researchers. In doing so, we will consider how support for doctoral students should be provided by the summer of FY2025. In addition, through the promotion of Industry-Academia-Government Collaboration Platforms for the Success of

Doctoral Personnel, the dissemination of guidebooks to promote the success of doctoral personnel in private companies, and the collection of case studies of doctoral personnel role models driving the future of industry, etc., we will promote understanding of the importance of the success of doctoral personnel in a wide range of industries, etc. In addition to creating an environment that makes it easier for private companies to hire doctoral personnel, we will aim to promote the success of doctoral personnel through industry-academia-government collaboration by providing support for corporate researchers to advance to doctoral programs, etc.

(Promotion of the Active Participation of Female Researchers)

- From the viewpoint of improving diversity in research and research environment, we will accelerate the active participation of female researchers through the elimination of the gender gaps, etc. Based on the Sixth STI Basic Plan and the Fifth Basic Plan for Gender Equality (Cabinet decision of December 25, 2020), we will promote initiatives to further enhance the careers of female researchers, including in leadership positions, by supporting the efforts of universities and other institutions to create an environment where life events such as childbirth and childcare can be balanced with research, and to realize diversity in the research environment.

(Promotion of Measures Based on the Policy Package on Education and Human Resource Development for the Realization of Society 5.0)

- Based on the Policy Package on Education and Human Resource Development for the Realization of Society 5.0 (Council for Science, Technology and Innovation decision of June 2, 2022), we will promote diversification of "time" and "space" for learning with an emphasis on the characteristics of children, the establishment of an ecosystem that supports Inquiry Based learning and STEAM education throughout society, the elimination of the divide between the humanities and sciences and the elimination of the gender gap in learning in science and mathematics. In particular, we will work with the cooperation of industry to promote initiatives to support study abroad at the high school and higher education levels throughout society, including the Tobitate! Study Abroad Initiative through public-private collaboration, and to build an ecosystem that provides diverse learning to children through the participation of companies, etc. The results of these initiatives will be fed back into policymakers as needed.

(Enhancement of Recurrent Education)

- We will realize an environment in which working people can respond to changes in social and economic structures by continuing to learn and receive diverse, high-quality recurrent education. To this end, in order to ensure that individuals' relearning is appropriately evaluated, the Government will promote the visualization of academic history, necessary abilities and learning, and the reflection of relearning in the evaluation and treatment of employees at companies, while accelerating efforts to build a recurrent education model that contributes to regional vitalization and economic growth through industry-academia-government collaboration platforms and industry-academia cooperative systems.

（3） Creation of Innovation Ecosystems

① Thorough Support for R&D Startups

(Enhancement of Support through the SBIR System)

- Through the Small/Startup Business Innovation Research (SBIR) system, etc., we will support research and development projects based on policy needs and government procurement needs, with the accompanying assistance of program managers. In addition, we will continue to support the technology demonstration phase in the field of advanced technology, which was added in FY2023, to strongly promote social implementation by startups and others.

(Promoting Public Procurement from Startups)

- In order to solve administrative issues for which it is difficult for the Government alone to find optimal solutions, we will further promote the use of the Startup Technology Proposal Evaluation System, which allows startups to receive negotiated contracts for their advanced and unique new technologies in accordance with government procurement needs. In addition to the special measures for bidding eligibility for startups, which were expanded in FY2023, we will promote the planning of R&D projects that will lead to public procurement in order to promote the use of the special measures for negotiated contracts for companies utilizing the SBIR system.

② Ecosystem Creation by Cities, Regions, Universities, Startups

(Supporting Startup Ecosystem Startup Cities)

- Based on the Second Startup Ecosystem Hub Formation Acceleration Plan, the Government will form the Second Startup Ecosystem Startup Cities for globalization in order to accelerate the growth of startups, and provide focused and intensive support for startups, including the Fund for New Industry Creation by Universities and the Global Acceleration Program, and strengthen networks for effective and efficient startup support. We will promote the formation of next-generation open innovation models so that each startup can grow through joint research with universities and collaboration with business companies via universities even after their establishment. In addition, we will promote awareness and utilization of the Project to Promote Foreign National Entrepreneurial Activities, for which the maximum period of stay was extended to two years in January 2025.

(Creating Environment that Encourages Open Innovation)

- In order to create regional economic ecosystems that strengthen research capabilities and industrial competitiveness through industry-academia collaboration, develop and supply human resources that meet the needs of industry, and lead to sustainable growth of the regional economy through innovation, we will continue to improve the environment for promoting joint research, etc. by actively utilizing open innovation hubs for startups and small and medium-sized enterprises to conduct joint research, etc. with universities. In addition, to strengthen the regional innovation ecosystems, AIST will accelerate regional innovation by expanding the

initiatives of the Bridge Innovation Laboratory (BIL), which promotes research and development based on the needs and characteristics of regional companies, together with regional universities. Furthermore, in order to promote industry-academia collaboration both in matching the needs and seeds of companies and universities and in fostering human resources for innovation creation, we aim to expand the membership of the Leaders' Forum on Promoting the Evolution of Academia for Knowledge Society (PEAKS), and consider how it can be managed independently.

(Promoting the Global Startup Campus (GSC) Initiative)

- By promoting the Global Startup Campus Initiative (hereinafter referred to as the "GSC Initiative"), we aim to create a world-class innovation ecosystem hub and build a research and innovation environment thoroughly based on global standards, aiming to create startups, solve global social issues, and achieve economic growth. Going forward, under the Integrated Innovation Strategy Promotion Council, we will promote efforts to realize the GSC Initiative based on the Basic Policy for the Global Startup Campus Initiative (Integrated Innovation Strategy Promotion Council decision of August 29, 2024).
- As a specific initiative, we will work toward the establishment of an operating corporation that will provide cutting-edge research support in the field of deep tech, startup commercialization support, and human resource development, including the necessary legal measures to make this a reality. In addition, prior to the establishment of the hub, in collaboration with overseas institutions, we will work on international research programs, programs to support startup commercialization and international expansion, and fellowship programs for human resource development to strengthen the ecosystem, in order to attract excellent human resources and investment from around the world.

(Improving Intellectual Property Governance at University)

- We will analyze the implementation status of IP management, etc., and issues and measures, etc., based on the University IP Governance Guidelines, and make improvements, etc., as necessary. We will collect and publicize good practices, etc. based on these guidelines, and promote the improvement of IP governance at universities. Furthermore, we will promote the dissemination of the Guidelines for the Handling of Intellectual Property by University Researchers upon Transferring from One University to Another.

(Human Resource Development as a Foundation for Startups)

- We will steadily implement the overseas dispatch program for entrepreneurs, etc., and promote support for the development of human resources for full-fledged commercialization by utilizing the Fund for New Industry Creation by Universities. In addition, we will promote entrepreneurship education by fostering entrepreneurship from an early stage, such as by dispatching Entrepreneurship Promotion Ambassadors appointed by the Minister of Education, Culture, Sports, Science and Technology to elementary, junior high, and senior high schools, and by providing practical educational programs, including for doctoral students.

(Promoting Smart Cities, Super Cities, etc.)

- Smart cities are sustainable cities and regions that solve various problems these cities or regions have and continue to create new value and are model regions for solving regional problems through the implementation of regulatory and institutional reforms. We will promote the initiatives of such Super Cities along with those of Digital Garden Healthcare Special Zones and "Kizuna" Special Zones. Smart cities need to move from the demonstration project stage to implementation. Based on the roadmap created in March 2024, the Government will steadily implement measures in cooperation with the public and private sectors, while all parties concerned share the issues to be addressed.

(Fukushima Institute for Research, Education and Innovation and Fukushima Innovation Coast Framework)

- The Fukushima Institute for Research, Education and Innovation (F-REI) aims to be a world-renowned 'center of excellence for creative reconstruction', while embodying dreams and hopes and for realizing the reconstruction of Fukushima, and the entire Tohoku region. We will promote initiatives to support F-REI for the acceleration of R&D.
- The Fukushima Innovation Coast Framework Promotion Organization and other organizations will play a central role in further promoting the Fukushima Innovation Coast Framework, and we will continue to promote the development of the demonstration environment, including the expansion of demonstration sites, in order to make the Fukushima Hamadori area, etc. a leading location for the creation of startups.

③ Promoting a Virtuous Circle of Human Resources, Technology, and Funds

(Developing and Securing Human Resources to Support Innovation)

- We will promote the development and securing of human resources to support innovation by promoting the activities of doctoral personnel, fostering young research personnel, and cross-border learning between large companies and startups, as well as by matching entrepreneurs with management and intellectual property human resources.

(Formation of a Growth-Oriented Capital Cycle)

- In order to strengthen the supply of growth capital for startups, we will take the following measures: (1) focused support by field, such as deep tech and drug discovery; (2) expansion of public investment to attract private investment, including investment by public-private funds (Japan Science and Technology Agency, Organization for Small & Medium Enterprises and Regional Innovation, Japan Investment Corporation, etc.); and (3) intensive public-private support through J-Startup. In addition, to diversify growth paths for startups and exit routes for investors, we will consider the necessary measures for policies to promote open innovation, including taxation, while taking into account issues including policy needs and convenience. In addition, for the deep tech sector, which requires a long period of time and large funds for R&D

and commercialization, we will provide consistent support from setting up a startup to commercialization from a long-term perspective.

(Promoting R&D Investment)

- The Sixth STI Basic Plan sets a five-year target of approximately 30 trillion yen in Government R&D investment and 120 trillion yen in total R&D investment by the public and private sectors. Of this, government R&D investment, including the FY2025 government budget, has reached approximately 40 trillion yen. R&D investment by private companies, which had been flat, finally started to pick up in FY2022, and the total R&D investment by the public and private sectors combined increased for three consecutive years until FY2023, reaching an all-time high, but still remains below the target of the Sixth STI Basic Plan. In order to win the international competition over science, technology and innovation, it is important for the public and private sectors to continue to cooperate and make the necessary R&D investments, as well as to implement the results of R&D in society and link them to Japan's economic growth.

3. Promotion of Initiatives Based on Discussions for the 7th Basic Plan

- The formulation of the Seventh STI Basic Plan, which is scheduled to commence in FY2026, has been under discussion since December 2024 in the Expert Committee on the Basic Plan established under the Council for Science, Technology and Innovation (CSTI). In light of the intensifying competition among countries for hegemony in cutting-edge science and technology, and in light of discussions on the importance of strengthening coordination with economic security, fundamentally enhancing Japan's research capabilities, and improving its innovation capabilities, we will promote the following initiatives, including from the perspective of strengthening governance such as the leadership in science, technology and innovation policies.

（1） Strengthening Linkages with Economic Security

① Promoting Research and Development of Key Technologies

- In light of the growing importance of science, technology and innovation in the economic security field, we will strengthen the linkage between science, technology and innovation policies and economic security policies, both offensively and defensively.
- We will organize and formulate a list of key technological areas for Japan, taking into account the perspective of economic security (securing and maintaining autonomy, superiority, indispensability, etc.), and flexibly update the list as necessary. In doing so, from a comprehensive perspective, we will develop a system to strengthen intelligence capabilities and think-tank functions that contribute to economic security, and conduct evidence-based studies by utilizing the Strategic Institute for Critical Technologies (tentative name; a think tank for safety and security), e-CSTI, etc., and conduct evidence-based studies while fully taking into account the opinions of relevant parties and outside experts.
- With regard to research and development in key technology areas, we are currently promoting the K Program, but we will continue to consider the nature of research and development related

to economic security. In addition to promoting economic security transformation, which reinterprets and advances research and development from the perspective of economic security, we will strategically promote research and development, including international cooperation and collaboration, such as joint research between nations. We will also continue to promote efforts to actively utilize cutting-edge science and technology in the field of security, based on the National Security Strategy.

② Promotion of Global Strategy

- It is important to further enhance Japan's global competitiveness by further strengthening its global research capabilities, industrial competitiveness, and response to economic security. To this end, we will strengthen our ties with the international community, including our ally and like-minded countries including the G7 and the Global South, including ASEAN and India.
- We will identify ally and like-minded countries that should be particularly prioritized for cooperation in each area based on sectoral strategies, etc., and will further strengthen cooperation through the conclusion of memorandums of cooperation and participation in bilateral and multilateral frameworks.

③ Thorough Implementation of Research Security and Integrity Initiatives

- In order to conduct international joint research on an equal footing with the G7 and other like-minded countries, it is necessary for Japan to promptly take necessary measures to ensure research security and integrity. For competitive research funds newly solicited from FY2026, we will work to ensure research security and integrity, and prevent technology leakage based on the guideline for preventing the leakage of critical technologies, etc. formulated by the Cabinet Office.

（2） Strengthening Research Capabilities, Developing and Securing Human Resources

① Strengthening the Operational and Research Infrastructure of Universities and other Institutions

- Along with the implementation of university governance reforms and personnel and salary management reforms, etc., including measures for aging facilities and equipment and upgrading of research facilities and equipment, while taking into account increases in personnel costs and prices, etc., we will secure basic expenses for national universities and Kokken, etc.
- We will establish the research infrastructure to provide motivated and capable researchers with research opportunities without being restricted by the organization to which they belong, by promoting the strategic development, shared use, and measures to address the aging of advanced research facilities and equipment, mainly at research universities, and securing technical experts, and by establishing a network of shared research centers. Furthermore, we will promote the advancement and efficiency of the research environment through the development of advanced measuring and analytical instruments and other equipment that take advantage of shared use, and through the large-scale integration, automation, autonomy, and remote-access of advanced

research facilities at inter-university research institutes, as well as through the provision of accompanying support in an integrated manner.

- We will strengthen the information infrastructure to promote the storage, management, distribution, and utilization of research data and accelerate AI for Science, including the development and sharing of foundation models for scientific research that utilize research data, including in fields such as life sciences and materials, leading to innovation in scientific research.

② Developing and Securing Human Resources and Supporting Young Researchers

- We will newly formulate the Science and Technology Human Resources Policy Package to promote the securing of human resources in science and technology to support Japan's research capabilities. The package will be designed to foster and secure excellent human resources such as researchers and R&D management personnel, support and promote doctoral personnel, foster the next generation of science and technology personnel, and reform related institutions and systems in a comprehensive and systematic manner.
- In order to encourage research themes that are not bound by existing research systems, we will consider appropriate forms of support, including further strengthening research capabilities through competitive research funds such as KAKENHI and improving the research environment through internationalization and support for young researchers in KAKENHI, while paying attention to rising personnel costs, prices, etc. In addition, we will fundamentally strengthen the research capabilities of research universities by promoting the acquisition of outstanding researchers and the development of young human resources through various schemes such as the System for Universities for International Research Excellence.

③ Promotion of International talent mobility and Circulation and Internationalization of Research

- In light of recent changes in the international situation, we will promote international talent mobility and circulation to strengthen Japan's research capabilities by actively attracting outstanding researchers and international students from the U.S., Europe, and other countries and regions, and by providing support and improving the environment so that Japanese researchers and others can concentrate on their research overseas. In addition, we will promote strategic collaboration through alliances with allies, like-minded countries, and the Global South, including ASEAN and India.
- Based on the progress of the projects and programs for Adopting Sustainable Partnerships for Innovative Research Ecosystem (ASPIRE) and other initiatives, Japan will strategically consider countries and fields in which it should strengthen its partnerships, including from the perspective of science and technology diplomacy, and promote international joint research and participation of researchers in international scientific top circles that ensure research security.
- We will promote the internationalization of research by continuing to promote the formation of hubs for international talent mobility and circulation that attract researchers from overseas through WPI, etc.

- We will promote research through international collaboration across disciplines and organizations in order to solve global social issues such as climate change and biodiversity, as well as from the perspective of preserving the Global Commons, the common property of humankind called the Earth system.

（3） Improving Innovation Capabilities

① Promoting Regional Innovation

(Promoting Innovation through the Use of University Knowledge)

- Through the Package for Comprehensive Promotion of Research Universities with a Regional Core and Distinctive Characteristics, the ministries and agencies will work together to provide integrated support for efforts by regions to create new industries and employment through innovation and to lead in solving regional issues by utilizing university knowledge.
- To strengthen industry-academia-government co-creation and startup creation in the regions, we will promote the formation of industry-academia-government co-creation opportunities where young researchers can contribute to solving regional issues, mainly at local universities. In addition, in order to promote the creation of university-launched startups in various regions, we will promote one-stop support from startup creation to growth, utilizing university technology seeds. We will promote the formation of next-generation open innovation models so that startups can grow through joint research with universities and collaboration with business companies via universities even after their establishment. In addition, we will promote a wide range of entrepreneurship education from the elementary, junior high, and senior high school stages to the graduate school stage in order to nurture leaders of industry and innovation in regional areas.

(Execution of the Second Phase of Startup Ecosystem Startup Cities)

- We will promote the formation of regional ecosystems that can be linked to overseas ecosystems by taking advantage of resources with regional industrial and research characteristics, etc., through the selection of new Startup Ecosystem Startup Cities in the second phase, etc., and promote procurement from startups in the regions, as well as promote collaboration in support of regional vitalization and startups by strengthening networks among Startup Cities and relevant ministries and agencies.

(Strengthening Startup Procurement in Local Governments)

- We will promote procurement from startups by providing a list of new technologies that startups can offer to the national government and other entities, a guidebook on public procurement measures, a practical guide for collaboration and procurement between local governments and startups, provide opportunities for matching startups with administrative agencies including local governments, and New Regional Economies and Living Environments Creation Grant. We will also promote the formation of a virtuous cycle of "knowing," "seeing," and "using" in

procurement from startups by local governments, including wide-area and joint trial procurement.

② Promoting IP and International Standards Strategy

- In order to solve global and social issues through international standardization and to create markets, etc., based on The New International Standards Strategy (Intellectual Property Strategy Headquarters decision of June 3, 2025), we will promote the integration of management strategies and international standardization activities in industry and academia, including from the perspective of economic security, and the incorporation of standardization support in national R&D projects as industry-academia-government-financial institutions initiatives. In addition, as part of efforts to strengthen the standard ecosystem, we will promote the development of expert personnel, reinforcement of domestic testing and certification infrastructure, and active utilization of standards and certification by the Government and enterprises. Furthermore, to clarify the standards strategy and for governance, we will establish a forum for public-private partnerships to serve as a command post, as well as a framework for information sharing. In addition, to strengthen international collaboration, we will promote international standardization human resource development and networking, utilization of international mutual recognition, strengthening of collaboration with ASEAN countries, and invitation of international conferences related to international standards.
- In addition, based on The New International Standards Strategy, we will select key domain, and among them, eight strategic domain (environment and energy, disaster prevention, mobility, food, agriculture, forestry, and fisheries, bioeconomy, quantum, information and communication, and digital and AI) with high urgency, and prepare priority support and action plans for each area, and conduct monitoring and follow-up. Among the strategic domain, we will set a pilot area and under the Government's lead, establish a one-stop standardization system from strategy formulation to standards development and utilization, formulate standardization strategies, and conduct standards development and negotiations under a well-developed system.
- In addition, we will share the results of monitoring international trends, etc. and follow-up on the strategy through public-private partnerships, digital platforms, etc., and the public and private sectors will work together to revise the strategy in a flexible manner.

③ Promotion of R&D Investment, etc.

(Comprehensive support for strategic technology areas)

- We will identify strategic technology areas for Japan and mobilize policies to provide comprehensive support for everything from human resource development to R&D, hub formation, capital investment, startup support, and rule-making. Through those efforts, we aim to establish a globally competitive innovation environment that attract private investment.

(Realization of a Virtuous Cycle between Advanced Research and Education at Universities and other Institutions and Strategic Investment at Universities)

- In order to realize a virtuous cycle in which universities striving for growth and global competitiveness can secure and effectively utilize diverse financial resources and strategically reinvest in science through increased industry-academia-government collaboration, active utilization of intellectual property, and the creation and development of startups, we will promote the sophistication of university governance, strengthen their functions as hubs for industry-academia-government collaboration, and support their global engagement.

(Formation of the largest Startup Ecosystem in Asia)

- In order to create globally competitive startups, we will promote the attraction of international capital and talent to Japan, while also supporting young investors and entrepreneurs in gaining overseas experience and expanding their business globally.
- In order to ensure diverse growth paths for promising startups and viable exit strategies for investors, we will enhance the ecosystem by promoting M&As and incentivizing post-IPO growth. In addition, to accelerate the development of deep-tech startups, we will provide end-to-end support from research to commercialization and promote public and private procurement to stimulate new demand.