

Chapter 1

Development of Science, Technology, and Innovation Policies

Section 1

Science, Technology, and Innovation Basic Plan

The government promotes science, technology, and innovation policy comprehensively and in a planned manner according to the Science, Technology, and Innovation Basic Plan (hereinafter referred to as the Basic Plan). The government renews and implements the 5-year Basic Plan pursuant to the Basic Act on Science, Technology, and Innovation (Act No. 130 of 1995).

The government has developed the 1st (FY1996 to FY2000), the 2nd (FY2001 to FY2005), the 3rd (FY2006 to FY2010), the 4th (FY2011 to FY2015) and the 5th (FY2016 to FY2020) Basic Plans and promoted science and technology policy according to the plans. (The 1st to 5th plans were called the Science and Technology Basic Plan.)

The 6th Science, Technology and Innovation Basic Plan (for the period from FY2021 to FY2025) (the “6th Basic Plan”) that started in FY2021 is the first plan since the Basic Act on Science and Technology was renamed the “Basic Act on Science, Technology, and Innovation” with its full-scale revision in June 2020. A study for the formulation of the 6th Basic Plan was conducted by the Expert Panel on Basic Policy for about two years. The panel was set up when the Prime Minister solicited advice from the Council for Science, Technology and Innovation (CSTI) regarding the 6th Basic Plan by issuing Consultation Request #21 “Regarding the Science and Technology Basic Plan” in April 2019. On March 26, 2021, the 6th Basic Plan was decided by the Cabinet.

As major changes in society during the period of the 5th Basic Plan, the 6th Basic Plan listed the following: the reorganization of the world order caused by intensified competition between nations with a focus on state-of-the-art technologies (AI, quantum technologies, etc.); the surfacing of the technology leak issue and strengthening of countermeasures; the manifestation of climate change and other global problems; and the exposure of the limitations of the information society (Society 4.0). The new plan pointed out that these changes are accelerated by the expansion of COVID-19. Next, it examined the past science, technology and innovation policies and described the following: Japan’s failure to make full use of the information and communication technologies on which Society 5.0 is premised; the lowering of the international position of Japan’s papers; the severe environment surrounding young researchers; and the inclusion of promotion of “humanities and social sciences” and “innovation creation” within the scope of the Basic Act on Science and Technology through its revision.

In this context, the 6th Basic Plan gave concrete shape to Society 5.0 as presented by the 5th Basic Plan and expressed it as a “society that is sustainable and resilient against threats and unpredictable and uncertain situations, that ensures the safety and security of the people, and that enables each and every individual to realize diverse forms of well-being.” The plan presented the following specific initiatives for its realization.

- ① Transformation into a sustainable and resilient society that ensures the safety and security of the people
- ② Developing frontiers of knowledge and strengthening research capabilities as sources of value creation

- ③ Education and human resource development to realize the diverse forms of well-being and an attitude to confront challenges for each and every individual

Section 2 Council for Science, Technology and Innovation (CSTI)

CSTI in the Cabinet Office is positioned as an “Important Council” toward vigorously promoting Japan’s science, technology and innovation policies under the leadership of the Prime Minister. CSTI consists of the Prime Minister as the chairperson, as well as related Cabinet members, executive members, and others. It has the mission of overseeing the nation’s science, technology, and innovation efforts and offering comprehensive and fundamental policy plans and general coordination.

CSTI has established seven Expert Panels that deliberate on technical aspects of key issues (Expert Panel on Basic Policy, Expert Panel on STI Strategy, Expert Panel on Important Issues, Expert Panel on Bioethics, Expert Panel on Evaluation, Expert Panel on the World Level Research Universities, and Expert Panel on Innovation Ecosystem).

Section 3 Integrated Innovation Strategy

The Japanese Government has been formulating the “Integrated Innovation Strategy” for cross-departmental and integrated promotion of related measures toward realization of Society 5.0. This strategy has been reviewing related measures after analyzing the situation surrounding science and technology innovations in Japan and abroad during the year, and identifying the needs for strengthening and new tasks to tackle.

The “Integrated Innovation Strategy 2023” is the third annual strategy positioned as an implementation plan of the 6th Basic Plan. This strategy clearly delineates the science, technology, and innovation policies to be implemented in the next year based on the growing expectations for science, technology, and innovation backed by the rapid progress of cutting-edge technology and the increasing importance of supply chains due to the prolonged situation in Ukraine.

The Integrated Innovation Strategy 2023 has the following three pillars at the center of its policies.

- ① Strategic promotion of advanced science and technology
- ② Enhancement of the knowledge base (research capabilities) and human resource development
- ③ Creation of an innovation ecosystem

Section 4 Science, Technology, and Innovation Administration System and Fund Cycle Invigoration

The Japanese Government considers various recommendations by the CSTI, and then—based on their individual jurisdictions—related administrative offices promote research by national experiment and research institutions, national research and development agencies, universities, etc. as well as research by various research programs, set up related research and development organizations, and take similar measures.

In Japan's initial budget for FY2023, the science and technology budget amounted to 4.7882 trillion yen, including a general account budget of 3.5170 trillion yen and a special account budget of 1.2712 trillion yen. In the supplementary budget for FY2023, the science and technology budget amounted to 4.1397 trillion yen, including a general account budget of 3.4702 trillion yen and a special account budget of 669.5 billion yen (as of February 2024).

Furthermore, in Japan, private companies account for approximately 70% of the total amount of investment in research and development. To maintain or increase such investment while also encouraging medium to long-term research and development aimed at achieving innovation, the government has set up an R&D Tax Credit System. In addition, the government decided to establish, by the FY2024 tax reform, tax deductions for innovation bases (innovation box tax regime), which is a system that applies tax breaks to income derived from patents and other intellectual property, with the aim of strengthening locational competitiveness as R&D bases, and encouraging private investment in intangible assets, amid the intensification of international competitiveness in innovation.

Chapter 2

Science, Technology, and Innovation Policy Toward Realization of Society 5.0

Section 1

Transformation into a sustainable and resilient society which ensures the safety and security of the people

This chapter is on the government's initiatives to redesign Japanese society and transform it into a society that enables each and every individual to realize diverse forms of well-being by solving global issues ahead of the world and ensuring the safety and security of the people.

1. Creating New Value through the Fusion of Cyberspace and Physical Space

To realize Society 5.0, the goal of the 6th Basic Plan, our aim is to create new value through fusion of cyberspace and physical space. Specifically, the goal is to create a high-quality digital twin using a wide variety of data in cyberspace, change physical space by actively using AI based on the digital twin, and reproduce the result in cyberspace, thereby transforming society into a society that creates a dynamic virtuous cycle that is constantly changing.

The specific contents are as follows:

- ❶ Strategy and organization for building cyberspace
- ❷ Development of data platforms and provision of highly convenient data utilization services
- ❸ Building a reliable data distribution environment, including data governance rules
- ❹ Next-generation infrastructure for the digital society and development and R&D of data /AI utilization technologies
- ❺ Fostering human resources who will play a vital role in the digital society
- ❻ Contribution to the international society on the ideal digital society

2. Promoting Social Change and Discontinuous Innovation to Overcome Global Issues

In order to realize a green transformation (GX) that simultaneously achieves decarbonization, energy security, and economic growth, in February 2023, the Cabinet decided the “Basic Policy for the Realization of GX- A roadmap for the next 10 years -” and in July, the “Strategy for Promoting Transition to a Decarbonized, Growth-Oriented Economic Structure” (hereinafter referred to as the “GX Promotion Strategy”).

In addition to conducting such initiatives for achieving carbon neutrality by 2050, which will reduce overall greenhouse gas emissions to zero by 2050, actions will be implemented for realization of a circular economy through sound and efficient waste treatment and advanced recycling, with an aim to create a society in which development of the green industry leads to economic growth and a virtuous cycle between the economy and the environment is created.

The specific contents are as follows:

- ❶ Promotion of R&D and cost reduction of innovative environmental technologies
- ❷ Promotion of R&D and demonstration for utilization of various energy sources
- ❸ Promoting economic and social redesign
- ❹ Encouraging changes in public behavior

3. Building a Resilient, Safe and Secure Society

The government aims to build a society that is resilient to natural disasters, which are becoming more frequent and severe. At the same time, the government will ensure the safety and security of people’s lives, the economy and society from attacks in new areas such as cyberspace or new biological threats, promote R&D of advanced technologies, and implement appropriate measures against technology leaks.

The specific contents are as follows:

- ❶ Responding to increasing frequency and severity of natural disasters
- ❷ Efficient infrastructure management through digitalization, etc.
- ❸ Ensuring security in cyberspace, where attacks are becoming increasingly diverse and sophisticated
- ❹ Response to new biological threats
- ❺ Responding to threats to the safety and security of space, maritime, and other fields
- ❻ Initiatives to “Know,” “Develop,” “Utilize,” and “Protect” for ensuring safety and security

4. Formation of an innovation ecosystem that will serve as the foundation for creating new industries for value co-creation

The goal is to create a society in which a new industrial base is built where companies, universities, public research institutions, etc., collaborate with each other to co-create value while ensuring diversity by creating a succession of startups that take on the challenge of solving issues driven by the needs of society.

The specific contents are as follows:

- ❶ Support for startup creation and growth based on social needs
- ❷ Promoting innovation activities in business
- ❸ Promoting new value co-creation through industry-academia-government collaboration
- ❹ Creation of a world-class startup ecosystem
- ❺ Developing human resources capable of taking on challenges
- ❻ Continuation and technological succession of R&D for important technologies that are highly necessary

to be retained in Japan

5. Urban and regional development that will serve as infrastructure to pass on to the next generation (development of smart cities)

The government aims to create a society with sustainable living infrastructure that maximizes human vitality for all stakeholders through the creation of diverse and sustainable cities and regions nationwide that can solve urban and regional issues and continue to create new value while demonstrating regional potential.

The specific contents are as follows:

- ❶ Development of infrastructure to facilitate data utilization and development of city OS that enables data linkage
- ❷ Development of smart city creation examples throughout Japan with collaboration centered around super cities
- ❸ International expansion
- ❹ Developing next-generation human resources for sustainable activities

6. Promoting R&D and social implementation to resolve various social issues and utilizing Convergence Knowledge (So-Go-Chi)

While utilizing “Convergence Knowledge (So-Go-Chi)” based on the fusion of humanities, social sciences, and natural sciences and in collaboration with countries, regions, and international organizations that share values with our country, the government aims to create a society where future industry creation and economic growth are compatible with the resolution of social issues and challenges by working on R&D and social implementation of the results.

The specific contents are as follows:

- ❶ Formulation and promotion of national strategies based on a vision of future society and evidence utilizing the Convergence Knowledge (So-Go-Chi)
- ❷ Promotion of mission oriented research and development for solving social issues
- ❸ Social implementation of advanced science and technology for solving social problems
- ❹ Promoting the resolution of social issues and acquisition of international markets through the international and strategic use of intellectual property and standards
- ❺ Strategic promotion of science and technology diplomacy

Section 2

Expanding the frontier of knowledge and strengthening research capabilities as a source of value creation

1. Reconstruction of the environment that generates diverse and outstanding research

To produce diverse and excellent research results that open up new frontiers of knowledge, the government aims to realize research environments in which researchers can demonstrate their abilities to the fullest and continue to take on the challenge of solving issues based on the diverse awareness of issues inherent in each of them.

The specific contents are as follows:

- ❶ Improving the treatment of doctoral students and expanding their career paths
- ❷ Development of an environment in which young researchers can play an active role at universities, etc.
- ❸ Promoting the active participation of female researchers
- ❹ Promotion of Basic and Academic Research
- ❺ Promotion of international joint research and international talent mobility and circulation
- ❻ Securing research hours
- ❼ Promotion of humanities and social sciences and creation of the Convergence Knowledge (So-Go-Chi)
- ❽ Comprehensive reform of the competitive research funds system

2. Construction of a new research system (promotion of open science and data-driven research, etc.)

These days, data-driven research methods utilizing simulations and AI are expanding as it becomes easier to collect and analyze various data, such as big data. This can be attributed to the digitalization of the whole society and the global trend toward open science, which requires the digital transformation of research itself (Research DX). Furthermore, the progress of Research DX is accelerating worldwide in the wake of the COVID-19 pandemic. In Japan, the government is working to build a research system toward the realization of a new society brought about by Research DX, such as promoting the management and utilization of research data, which is an important keyword, and developing infrastructure to support Research DX.

The specific contents are as follows:

- ❶ Developing an environment to promote appropriate management and utilization of reliable research data
- ❷ Developing infrastructure to spur Research DX for research outcome with high impacts
- ❸ Creation of a new research community and environment pioneered by research DX

3. Promoting university reform and enhancing functions for strategic management

As nodes of diverse knowledge and the largest and most advanced knowledge base, universities are expected to play a leading role in Society 5.0. To successfully survive in a highly uncertain society by utilizing a rich knowledge base, the goal is to form a diverse group of universities by developing individual strengths and clarifying the missions appropriate for each university.


The specific contents are as follows:

- ❶ Transformation of national university corporations into truly corporate management
- ❷ Deregulation to support strategic management
- ❸ Enhancement of Japan's research capacity
- ❹ Diversification of public funds and governance to support university foundations
- ❺ Strengthening the functions and financial bases of national research and development agencies

Section 3

Education and Human Resources Fostering to Realize the Diverse Forms of Well-Being and an Attitude to Confront Challenges for Each and Every Individual

The key to realizing Society 5.0 is the human resources responsible for achieving this. For this reason,



the 6th Basic Plan emphasizes the importance of abilities and qualities that can be acquired through investigative activities wherein students identify issues and seek solutions themselves with the aim to develop human resources who will pursue diverse forms of well-being and confront challenges by honing and enhancing these abilities and qualities. This white paper describes the measures being taken by the government toward achieving this goal.

The specific contents are as follows:

- ❶ Enhancing the development of the ability to inquire by promoting STEAM education
- ❷ Participation and utilization of external human resources and other resources in learning
- ❸ Promotion of DX in the education field
- ❹ Promotion of mobility of human resources and enhancement of learning for career changes and career advancement
- ❺ Fostering an environment and culture in which society and companies promote continuous learning
- ❻ Provision of diverse curricula and programs at universities and colleges of technology (KOSEN)
- ❼ Co-creation of knowledge and strengthening of science and technology communication through the participation of various actors, such as citizen participation