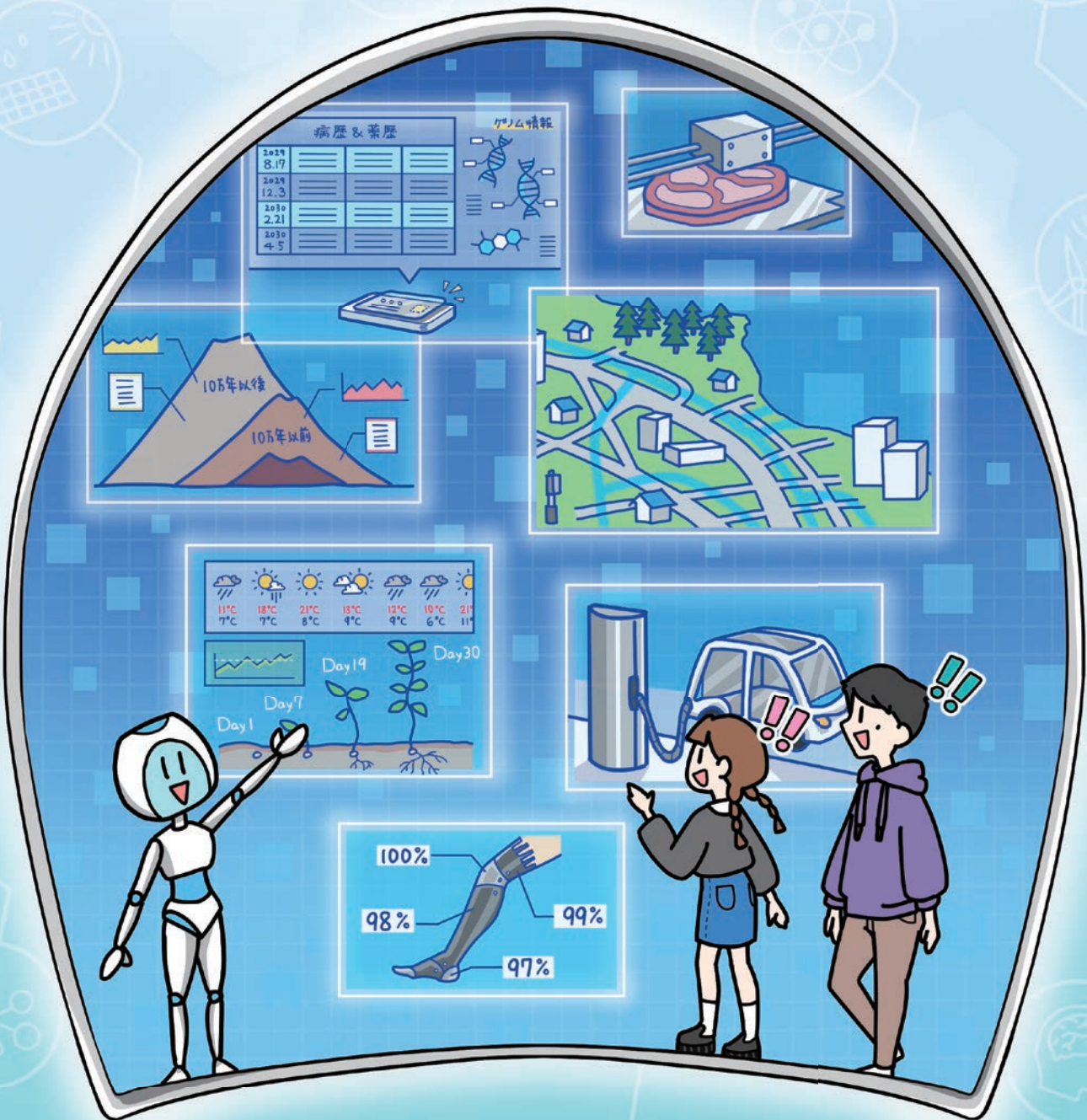


▶▶▶ Part II ▶▶▶

Measures Implemented to Promote Science and Technology



Part II describes the measures taken to promote science and technology in FY 2019 in accordance with the 5th Science and Technology Basic Plan (January 22, 2016 Cabinet Decision).

Chapter 1 Development of Science and Technology

Section 1 The Science and Technology Basic Plan

Science and technology policy in Japan is promoted comprehensively and in a planned manner according to the Science and Technology Basic Plan (hereinafter referred to as the Basic Plan). The government renews and implements the 5-year Basic Plan pursuant to the Science and Technology Basic Law (Law No. 130, 1995).

The government has developed the 1st (FY1996 to FY2000), the 2nd (FY2001-FY2005), the 3rd (FY2006-FY2010) and the 4th (FY2011-FY2015) Basic Plans and promoted science and technology policy according to the plans.

Towards formulating the Basic Plan, which was to start in FY 2016, the Prime Minister solicited advice from the Council for Science, Technology and Innovation (CSTI) by issuing the Consultation Request #5, Regarding the Basic Plan. CSTI established the Expert Panel on Basic Policy and conducted studies and examinations for one year. In December 2015, CSTI responded to the Consultation #5. On January 22, 2016, a Cabinet Decision was made to implement the 5th Basic Plan.

The 5th Basic Plan presents recognition of the current situation of Japan and the world: This is a “period of great change” when the socioeconomic structure changes day by day due to the development of Information and Communication Technology (ICT) and other technologies. The importance of promoting science, technology and innovation (STI) has been growing due to increases in the number of domestic and international issues, and in the complexity of those issues. The basic plans of the previous 20 years have had achievements and issues. The achievements include steady improvements in the R&D environment, and notable award-winning R&D such as iPS cell technologies and blue LEDs. Issues include the weakening of “basic strengths” in science and technology and the stagnation of government investment in science and technology.

In this context the 5th Basic Plan envisions goals Japan should: 1) achieve sustainable growth and self-sustaining regional development; 2) ensure safety and security for the nation and citizens and a high quality, prosperous way of life; 3) address global challenges and contribute to global development; and 4) promote sustainable creation of intellectual assets. To realize these visions, with focus on the ability to forecast the future (foresight and strategical strength) and the ability to adequately adapt to any changes (diversification and flexibility), the Plan sets the following 4 policy pillars:

i) Acting to create new value for the development of future industry and social transformation

Society 5.0¹ is to be strongly promoted to make a large change and to lead the era of revolution through a series of undertakings that realize a “super smart society” in which new values and services are created one after another ahead of the world and through the strengthening of R&D that achieves independent innovation.

¹ Society 5.0 refers to a new economic society following a hunter-gatherer society, agrarian society, industrial society and, information society. This will be a human-centered society characterized by the sophisticated integration of cyberspace with physical space (“the real world”) and successful combination of economic development and solution of social problems to enable a comfortable, vigorous and high-quality life.

ii) Addressing economic and social challenges

To take appropriate pre-emptive action addressing the various issues that have emerged domestically and globally, the national government will select important policy issues and promote STI towards addressing national and global issues before they become problems.

iii) Reinforcing the “fundamentals” for science, technology, and innovation

Basic capabilities in STI will be dramatically strengthened to address possible future changes flexibly and adequately, through the fostering of young human resources, the promotion of their active role-taking, and the reform and strengthening of universities.

iv) Building a systemic virtuous cycle of human resource, knowledge, and funding for innovation

Making the most of domestic and international human resources, knowledge and funds, we will foster and take advantage of “new value.” To this end, we will develop an innovation creation system by circulating human resources, knowledge and funds beyond any barriers by fostering strong, deep collaboration among private businesses, universities and public research institutions and by strengthening startups establishments.

The plan states that strategic international development combined with science and technology diplomacy is indispensable for Japan to promote the four pillars. It is also announced that Japan will constantly be working to improve the quality of its policies by determining key indicators and numerical targets to determine the progress and outcomes of the 5th Basic Plan through their achievement levels.

The 5th Basic Plan sets a target of at least 4% for public- and private-sector R&D investment as a share of GDP and a target of 1% for governmental R&D investment as a share of GDP. The latter is thought to be achievable with the Plan to Advance Economic and Fiscal Revitalization included in the Basic Policy on Economic and Fiscal Management and Reform 2015 approved by the Cabinet in June 2015. Assuming that the nominal GDP growth rate during the 5th Plan averages 3.3%, the investment in governmental R&D during that plan will total 26 trillion yen.

Section 2 Council for Science, Technology and Innovation

CSTI in the Cabinet Office is positioned as a council that advances key policies toward vigorously promoting Japan’s science and technology policies under the leadership of the Prime Minister. CSTI consists of the Prime Minister as the chairperson, related Cabinet members, expert members and others, all of whom have the mission of overseeing the nation’s science and technology efforts and offering comprehensive and fundamental policy plans and general coordination (Table 2-1-1).

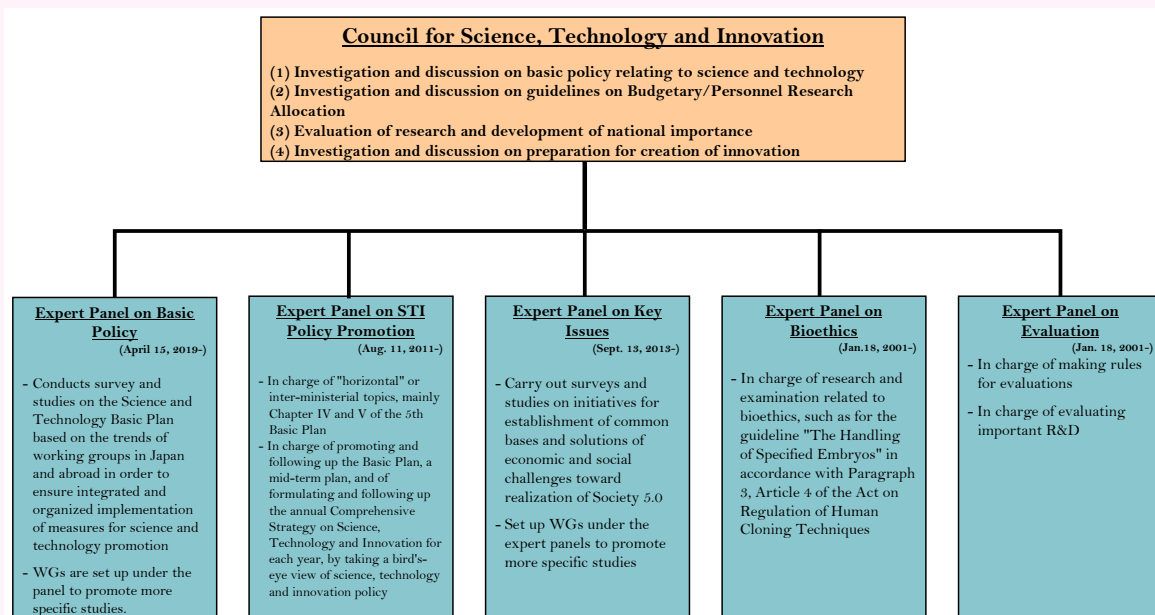
CSTI has established the expert panels that deliberate on technical aspects of key issues (Figure 2-1-2).

■ Table 2-1-1/List of CSTI members

Cabinet members	ABE Shinzo	Prime Minister
	SUGA Yoshihide	Chief Cabinet Secretary
	TAKEMOTO Naokazu	Minister of State for Science and Technology Policy
	TAKAICHI Sanae	Minister of Internal Affairs and Communications
	ASO Taro	Minister of Finance
	HAGIUDA Koichi	Minister of Education, Culture, Sports, Science and Technology
	KAJIYAMA Hiroshi	Minister of Economy, Trade and Industry
Experts	UEYAMA Takahiro (full-time)	Former Professor and Vice-President, The National Graduate Institute for Policy Studies (GRIPS)
	KAJIWARA Yumiko (part-time)	Corporate Executive Officer, Fujitsu Limited
	KOTANI Motoko (part-time)	Organization Director, Organization for Advanced Studies Principal Investigator, Advanced Institute for Materials Research (AIMR); Prof., Graduate School of Science, Tohoku University
	KOBAYASHI Yoshimitsu (part-time)	Chairperson of the Director of the Board, Mitsubishi Chemical Holdings Corporation
	SHINOHARA Hiromichi (part-time)	Chairman of the Board, NIPPON TELEGRAPH AND TELEPHONE CORPORATION; Vice Chair, KEIDANREN and the Chair of the Committee on Digital Economy, KEIDANREN
	HASHIMOTO Kazuhito (part-time)	President, National Institute for Materials Science (NIMS)
	MATSUO Seiichi (part-time)	President, Nagoya University
YAMAGIWA Juichi (part-time)	President of the Science Council of Japan (The head of affiliated institutions)	

Source: Cabinet Office

Figure 2-1-2/Organizational chart of CSTI



Source: Cabinet Office

1 Major Endeavors of CSTI in FY2019

CSTI has been discussing policy, budgets and systems. Such discussions address the following: 1) the establishment of the Integrated Innovation Strategy 2019 (approved on June 21, 2019 by Cabinet Decision), and 2) the operation of the Cross-ministerial Strategic Innovation Promotion Program (SIP) and Public/Private R&D Investment Strategic Expansion Program (PRISM).

In FY2019, the Meeting to Promote Comprehensive Innovation Strategy on April 18, 2019 started studies toward formulation of the 6th Basic Plan based on the Consultation Request #5, Regarding the Basic Plan issued by the Prime Minister. At the same time the Expert Panel on Basic Policy was set up to carry out survey and studies for the plan. In addition, a working group on institutional issues was set up under the panel to study institutional issues toward formulation of the 6th Basic Plan. The working group studied the direction of the review of The Science and Technology Basic Law and other matters. The Meeting to Promote Comprehensive Innovation Strategy on January 25, 2020 decided the "Comprehensive Package to Strengthen Research Capacity and Support Young Researchers" and "Moonshot goals" for the Moonshot-type Research and Development System¹.

2 Strategic Prioritization in the Science and Technology-related Budget

CSTI allocates the science and technology-related budget to important fields and measures, oversees all science, technology and innovation measures, and leads the activities of relevant ministries and agencies. It does the above in order for the Basic Plan and the Integrated Innovation Strategy to be implemented.

¹ A system for the whole government to make continuing and stable promotion efforts of aggressive R&D based on unconventional and bold thinking with the aim of creating disruptive innovations from Japan.

(1) The policy for the allocation of budgets and other resources related to science and technology

According to the basic plan showing the medium- to long-term policy direction and based on the changes in the situation of the year, CSTI under the Integrated Innovation Strategy suggested areas of policy focus for the year, and proposed that allocations of governmental science and technology-related budgets be focused on important areas and programs and that policy be subjected to PDCA cycles.

(2) Promotion of the Strategic Innovation Promotion Program (SIP)

Through inter-ministerial and inter-disciplinary management where CSTI functions as the control tower, the SIP encompasses everything from basic research to the practical application and commercialization of research results under industry-academia-government collaborations. According to the CSTI policies, the Cabinet Office budget for Creating and Promoting Science, Technology and Innovation (FY2019: 55.5 billion yen) was intensively allocated to the implementation of the SIP. Health and medicine were promoted under the Headquarters for Healthcare Policy.

In the first period of SIP implemented for 5 years from FY2014 the following 11 tasks have been selected to contribute to the solution of social problems, enhancement of industry competitiveness and economic reform. The tasks other than “Cyber-Security for Critical Infrastructures” entered their last year in FY2018 (Table 2-1-3). The task “Cyber-Security for Critical Infrastructures” was implemented for 5 years from FY2015 to 2019.

For the 10 tasks that ended in FY2018, follow-up surveys have been implemented since 2019 to investigate the status of the social implementation of the individual tasks’ results and to actively demonstrate successful cases to outside parties. A follow-up survey of “Cyber-Security for Critical Infrastructures” will be implemented after FY2020. Based on the result of the follow-up surveys¹ of the first period of SIP, issues to be tackled from the program implementation stage toward social implementation will be identified, and these will be reflected in the system and task management of the second period of SIP.

¹ <https://www8.cao.go.jp/cstp/gaiyo/sip/200305/siry02-2.pdf>

■ Table 2-1-3/First period of Strategic Innovation Promotion Program (SIP)

Innovative Combustion Technology	Realize innovative combustion technology to improve Maximum Thermal Efficiency of internal combustion engines for passenger vehicles to 50% in lasting industry-academia cooperation.
Next-Generation Power Electronics	Significantly improve the performance of the current power electronics to contribute to energy conservation and expansion of the introduction of renewable energy and thereby create a big market.
Structural Materials for Innovation	Accelerate development of revolutionary light-weight materials having excellent heat/environment resistance and their application to airplanes and other real machines so that Japanese component/materials industries can maintain and strengthen their competitiveness.
Energy Carriers	Utilize the hydrogen derived from renewable energy, etc. to create a clean, economically efficient and highly secure society
Next-Generation Technology for Ocean Resources Exploration	Establish technologies for highly efficient survey of ocean resources including sea-floor hydrothermal deposits and cobalt-rich manganese crusts ahead of the world to create an ocean resource surveying industry.
Automated Driving System	Realize an advanced automated driving system, including its development to being the next-generation urban transportation. Reduce accidents and congestion while improving convenience.
Infrastructure Maintenance, Renovation and Management	Raise the level of maintenance at low cost through preventive maintenance. Create a continuing maintenance market while promoting overseas development.
Enhancement of Societal Resiliency against Natural Disasters	Construct a mechanism to share disaster information in public and private efforts in preparation against natural disasters in order to improve our prevention/prediction capabilities and strengthen our response capability.
Cyber-Security for Critical Infrastructures	Conduct R&D of behavior monitoring and analysis technology and defense technology including authenticity determination for control/communication equipment to strengthen the international competitiveness of critical infrastructure operators.
Technologies for Creating Next-Generation Agriculture, Forestry and Fisheries	Develop innovative production systems, new breeding, plant protection and new functions integrally with the agricultural reform to contribute to income increase for new farmers, agriculture and villages.
Innovative Design/Manufacturing Technologies	Establish a new manufacturing style to break through temporal and spatial restrictions, which will enable high value-added product design and production and thereby strengthen the competitiveness of industrial areas.

In the second period of SIP funded by the FY2017 supplementary budget, the productivity revolution that is the intention of the budget as well as the following 12 tasks are promoted, adhering to the concept of the first period SIP toward realization of Society 5.0 (Table 2-1-14) (see Reference). In this process, based on the suggestions (e.g. utilization of matching funds from private companies, etc., introduction of stage gate evaluation and implementation of a follow-up survey) in the system evaluation carried out in the FY2018 that was the last year of the first period of SIP, the Guidelines on the Strategic Innovation Promotion Program were revised and the SIP system was reviewed.

■ Table 2-1-4/Second period of Strategic Innovation Promotion Program (SIP)¹

Fundamental cyberspace technologies using big data and AI	Establish and commercialize the world's most advanced human interaction technologies (sense/cognitive technology development, etc.) by merging language and non-language information in real space, data exchange platforms and AI coordination.
Fundamental digital data processing technologies in physical space	Develop and commercialize the world's most advanced fundamental technologies that enable high-performance sensing, highly efficient data processing and close coordination with the cyber side.
Cyber and physical security matching an IoT ² society	Promote what will be the world's cutting-edge "cyber and physical security measure base" that can be used for protection of the entire supply chain including SMEs, while at the same time strengthening cooperation with the United States and European and other countries to ensure international standardization and social implementation in order to protect various IoT equipment and establish the safety and security of the entire society toward secure Society 5.0.
Automatic driving (expansion of systems and services)	Establish the world's most advanced core technologies (e.g. technologies on collection and distribution of road traffic information including signal and probe information) that are cooperation areas of auto manufacturers, construct a basis for realization of Level 3 automatic driving on open roads and commercialize the technologies.
Materials revolution through an integrated materials development system	Toward substantial reduction of material development cost and time, realize and commercialize the world's most advanced inverse problem materials integration (prediction of optimum materials, processes and structures based on the desired performance) and thereby contribute to the development of super high-performance materials and establish a reliability evaluation technology.
Society 5.0 realization technology using photon/quantum	Develop and commercialize the world's most advanced processing technologies using light quantum technology (e.g. laser machining), optoelectronic information processing and communication (quantum cryptography).
Smart bioindustry and agricultural infrastructure technology	For the food industry value chain, covering the range from production and distribution up to recycling with focus on agriculture, demonstrate model cases of the food value chain that reduce environmental burden using "Bio X Digital," which also targets "the venous system" including export expansion of agricultural products and processed goods, strengthening of production fields (productivity improvement and workload reduction) and container packaging recycling.
Energy system of IoE ³ society	Carry out concept design of the energy system that contributes to optimization of energy demand and supply, develop common fundamental technologies (power electronics) and conduct practical application R&D (wireless power transmission system), while at the same time advancing system development and standardization for social implementation.
Enhancement of national resilience (disaster prevention/mitigation)	Construct an information system to support decision making by the national and municipal governments by using satellites, AI big data and other latest science and technologies in case of a large-scale disaster.
Advanced diagnosis and treatment system at AI hospitals	Develop, construct and socially implement the "AI hospital system" using AI, IoT and big data to provide advanced medical services and improve efficiency in hospitals (drastic reduction of burden on doctors and nurses.)
Smart material distribution service	Toward utilization of rich ocean mineral resources within the exclusive economic zone of Japan, lead the world in establishing, demonstrating and commercializing technologies to survey ocean resources deeper than 2000m below sea level.
Innovative deep sea resource survey technology	Toward utilization of rich ocean mineral resources within the exclusive economic zone of Japan, lead the world in establishing, demonstrating and commercializing technologies to survey ocean resources deeper than 2,000m below sea level.

¹ Details are in the appendix at the end of Part II

² Internet of Things

³ Internet of Energy

(3) Promotion of the Public/Private R&D Investment Strategic Expansion Program (PRISM)

PRISM is a program established in FY2018 in order to steer measures of individual ministries/agencies to areas¹ where they are likely to induce private investments and where efficiency improvement of the government spending is expected through utilization of R&D results. According to the various strategies decided by the CSTI, budget has been allocated with focus on initiatives to establish a data coordination platform for infrastructure, drug discovery, agricultural and other fields. Projects of individual ministries and agencies will be accelerated to expand private and public R&D investments based on the various strategies decided by the CSTI.

(4) Promotion of the Moonshot-type Research and Development System

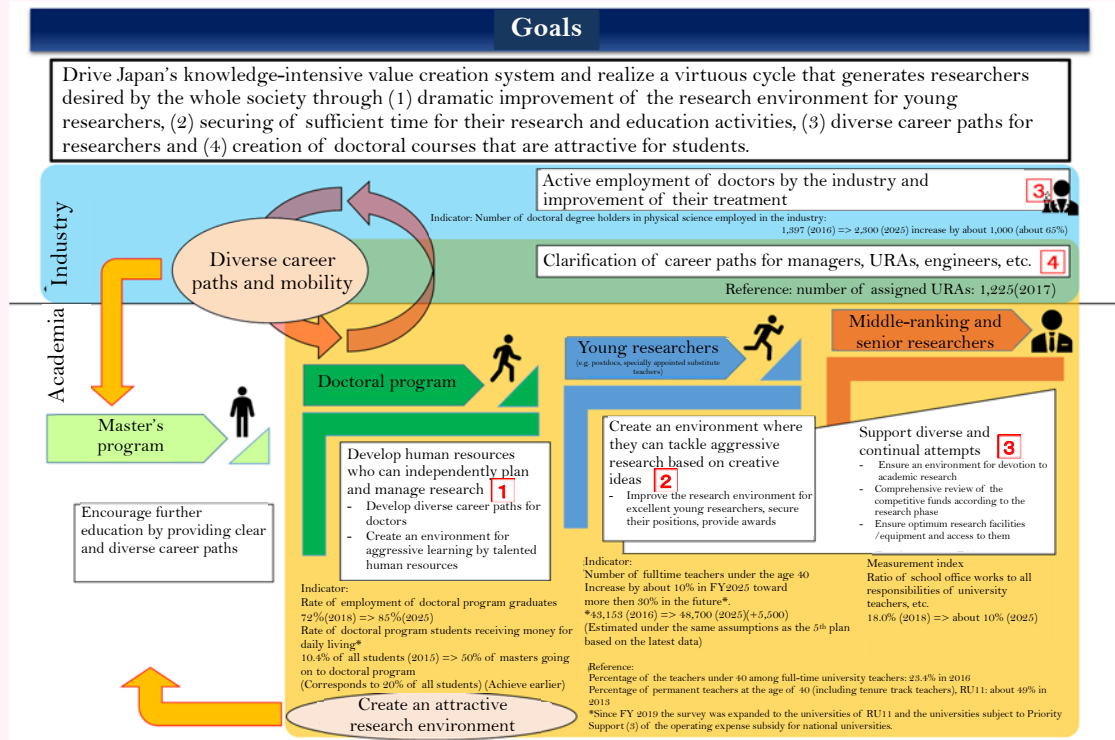
The Moonshot-type Research and Development System was promoted for the whole government to make continuing and stable promotion efforts of aggressive R&D based on unconventional and bold thinking with the aim of creating disruptive innovations from Japan. Based on the study results of the Visionary Meeting on the Moonshot-type Research and Development System and the Moonshot international Symposium, the CSTI held on January 2020 decided six goals to be achieved by 2050 for social challenges, the realization of which is difficult but expected to have a big impact on future society (see Part 1 Chapter 3 Section 2.)

(5) Formulation of the Comprehensive Package to Strengthen Research Capacity and Support Young Researchers

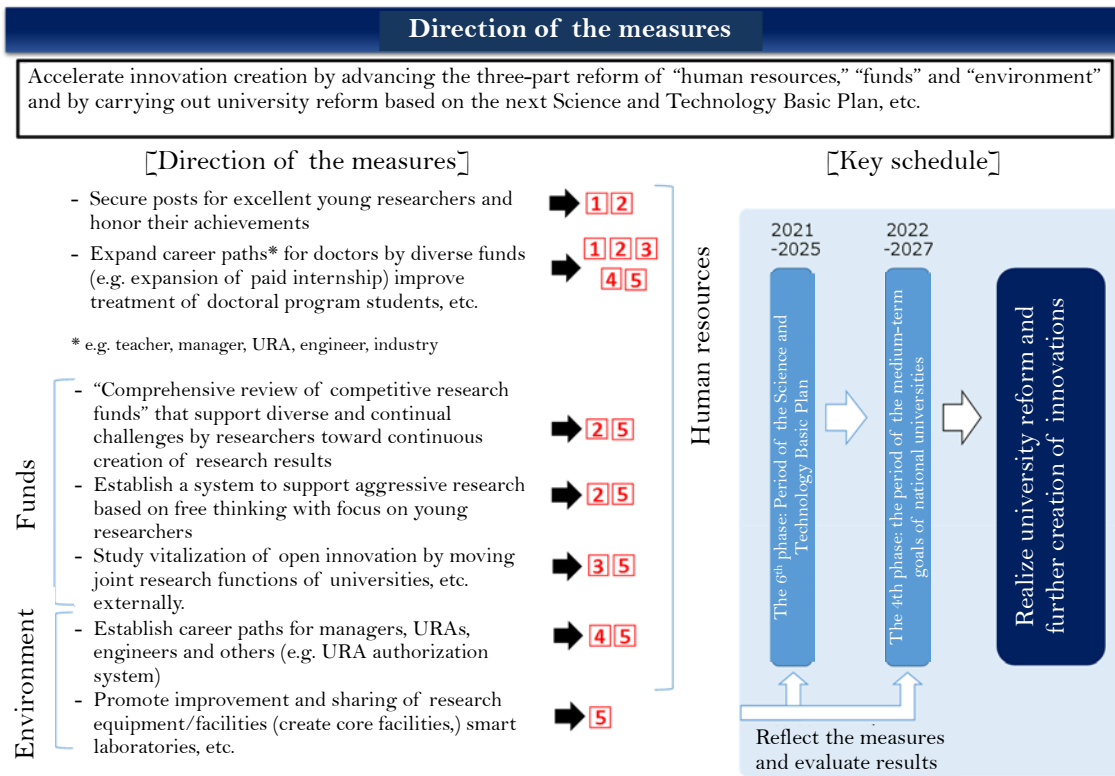
Comprehensive Package to Strengthen Research Capacity and Support Young Researchers was formulated for comprehensive and dramatic strengthening of Japan's research capacity by developing the "Research Capacity Improvement Reform 2019" formulated by MEXT into a three-part reform of human resources, funds and the environment.

¹ AI, construction/infrastructure maintenance and disaster prevention /mitigation and bio technologies

Figure 2-1-5/Comprehensive Package to Strengthen Research Capacity and Support Young Researchers



Chapter 1



Source: Cabinet Office

■ Table 2-1-6/Key projects for promotion of science and technology policies (FY2019)

Ministry	Implemented by	Project
Cabinet Office	CSTI	Public/Private R&D Investment Strategic Expansion Program (PRISM)

3 R&D Evaluation of Projects of National Importance

For comprehensive and plan-based promotion of the nation's science and technology policy, CSTI implements evaluation of R&D projects of national importance including large-scale R&D¹ implemented by individual ministries based on Article 26 paragraph (1)(iii) of the Act for Establishment of the Cabinet Office (Act No. 89 of 1999).

In the last fiscal year of the period for a medium- to long-term plan of a national research and development agency, CSTI offers opinions on estimation evaluations and drafts of the next medium- to long-term objectives from the perspective of linking with the Basic Plan and other national strategies based on Article 5 of the Act on Special Measures concerning the Promotion of Research and Development by Designated National Research and Development Agencies (Act No.43 of 2016).

(1) CSTI's opinions on the estimation evaluation at the end of the medium- to long-term objective period by a Designated National Research and Development Agency (approved and notified on December 26, 2019)

CSTI decided its opinions on the estimation evaluation at the end of the medium- to long-term objective period (FY2019) by the National Institute of Advanced Industrial Science and Technology. The opinions were notified to the Minister of Economy, Trade and Industry, who oversees the institute.

(2) CSTI's opinions on the drafts of the next medium- to long-term objectives of a Designated National Research and Development Agency (decided and offered on February 27, 2020)

CSTI decided its opinion on the drafts of the next medium- to long-term objectives (for the period from April 2020 to March 2025) of the National Institute of Advanced Industrial Science and Technology upon request from the Minister of Economy, Trade and Industry and offered the opinion to the minister who oversees the institute.

4 Major Deliberations at Expert Panels

(1) Expert Panel on Evaluation

The Panel compiled the opinions on the estimation evaluation at the end of the medium- to long-term objective period by a Designated National Research and Development Agency (National Institute of Advanced Industrial Science and Technology) and its drafts of the next medium- to long-term objectives. In addition, the panel started research and studies for enhancement of R&D evaluation.

¹ R&D projects with 30 billion yen or more national expenses in total, which the Expert Panel on Evaluation found to require evaluation in light of their importance for the science and technology policy.

(2) Expert Panel on Bioethics

In order to deepen discussions on research that uses genome editing technology for human fertilized embryo, the Expert Panel on Bioethics set up a task force for review, etc. of “the Basic Idea on Handling of the Status of Human Embryo” and compiled a report on the review, etc. of “the Basic Idea on the Status of Human Embryo – use of genome editing technologies on human fertilized embryo”. The Panel will continue to deepen discussions on such use.

(3) Expert Panel on Basic Policy

Based on the status of implementation and studies of the Integrated Innovation Strategy formulated for the period within the 5th Basic Policy, the panel started studies toward formulation of the next Basic Plan while reviewing the 5th Basic Plan.

Section 3 Integrated Innovation Strategy

CSTI formulated “Integrated Innovation Strategy 2019” for cross-departmental and integrated promotion of related measures toward realization of Society 5.0 (Figure 2-1-7).

This strategy reviewed 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. Toward realization of Society 5.0 that was advocated first in the world, the strategy includes initiatives to be promoted for priority items such as “Smart City,” “strengthening of research capacity,” “dramatic strengthening of international cooperation” and “formulation of priority strategies in the most advanced (important) fields including AI.”

Specifically, finely-tuned measures will be taken to create a virtuous cycle for fostering of start-ups, places will be created to gather top-level talents and investments from Japan and abroad for cutting-edge technologies including quantum and AI technologies, and bold policies free of conventional ideas will be speedily and surely implemented toward the goal to make Japan “the world’s most innovation-friendly country”.

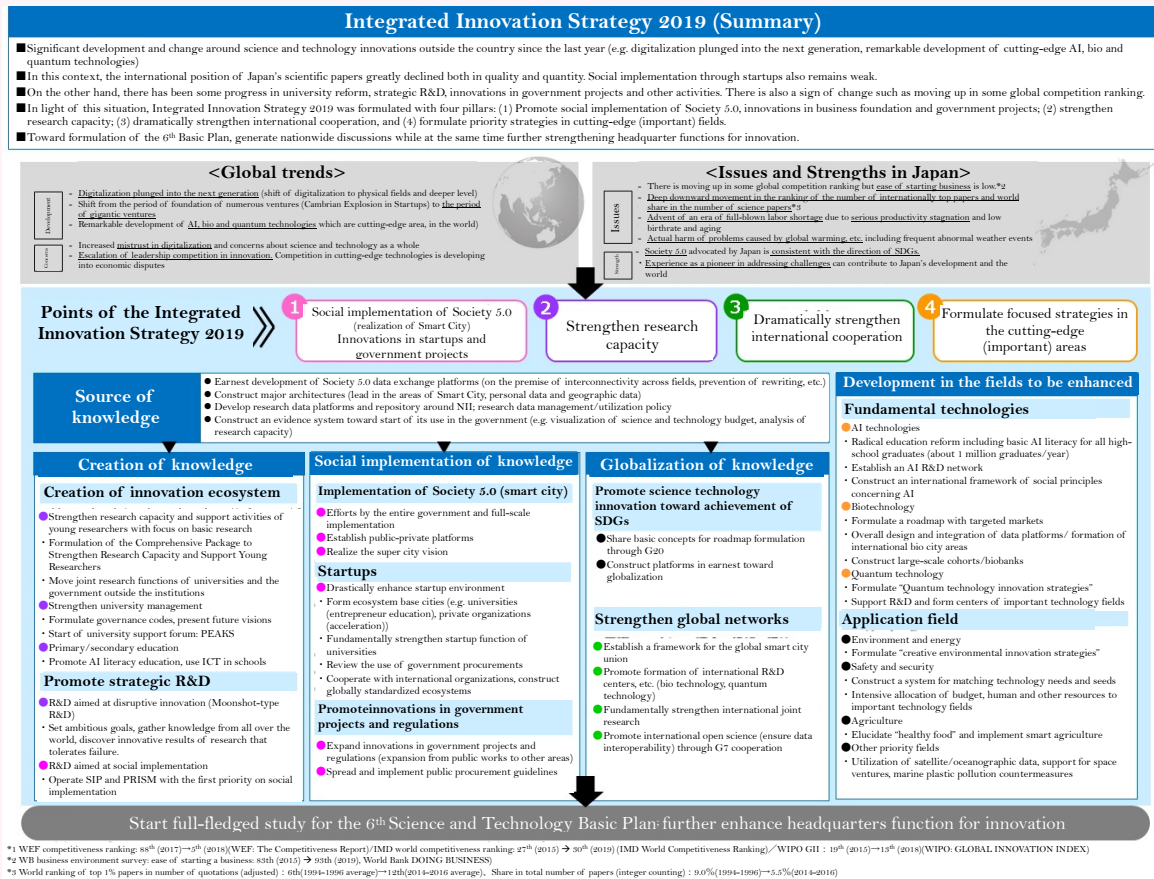
To this purpose, CSTI formulated the “AI Strategy 2019 (decided by the Meeting to Promote Comprehensive Innovation Strategy on June 11, 2019) toward spread of AI to people, industry, local communities and the entire government, which includes education reform, research and development and social implementation, in order to overcome social challenges of Japan and boost industrial competitiveness of the country.

For biotechnology where progress of synthetic biology, genome editing technology, etc. is significant, “Bio Strategy 2019” (decided by the Meeting to Promote Comprehensive Innovation Strategy on June 11, 2019) was formulated with the aim of “realizing the world’s cutting edge bioeconomy society by 2030.” Initiatives promoted based on the strategy include study of overall design of data infrastructure in the biological field, development of road maps for the nine market areas identified in the strategy and studies toward creation of international biocommunity.

For quantum technology, a field for which expectations are rising as systematized technology that will bring about dramatic innovations for productivity revolution and a society of health and longevity and safety /security of the country and people, the CSTI formulated the “Quantum Technology Innovation

Strategy” (decided by the Meeting to Promote Comprehensive Innovation Strategy on January 21, 2020) that encompasses the entire country. Based on the strategy, the whole government has been powerfully promoting comprehensive and strategic initiatives on quantum technology innovation.

Figure 2-1-7/Integrated Innovation Strategy 2019 (Summary)



Source: Cabinet Office

Section 4 Administrative Structure and Budget for Science, Technology and Innovation Policies

1 Administrative Structure for Science, Technology and Innovation Policies

On the basis of these recommendations and guidelines, relevant administrative agencies are supervising the following: 1) research conducted at national experiment and research institutions, at national R&D agencies and at universities, 2) the promotion of research under various research programs, and 3) improvements in the environment for R&D activities.

MEXT is responsible for the coordination that is necessary for the development of specific R&D programs in diverse fields as well as for science and technology-related of various administrative agencies. MEXT also has initiatives in comprehensively promoting the implementation of R&D programs in important advanced science and technology fields and the advancement of creative basic research. The Council for Science and Technology (CST), under the jurisdiction of MEXT, is engaged in investigations

and deliberations regarding important matters related to the comprehensive promotion of S&T, following the advice of the minister of MEXT, and also offers its views to the minister.

Table 2-1-8 shows major decisions and reports from CST.

The Science Council of Japan (SCJ), an organization that represents Japan's scientific community and has 210 members and about 2,000 associate members, is under the supervision of the prime minister. SCJ's duties are to carry out deliberations of important matters regarding science and work for their realization, while coordinating scientific research to improve their efficiency (Figure 2-1-9).

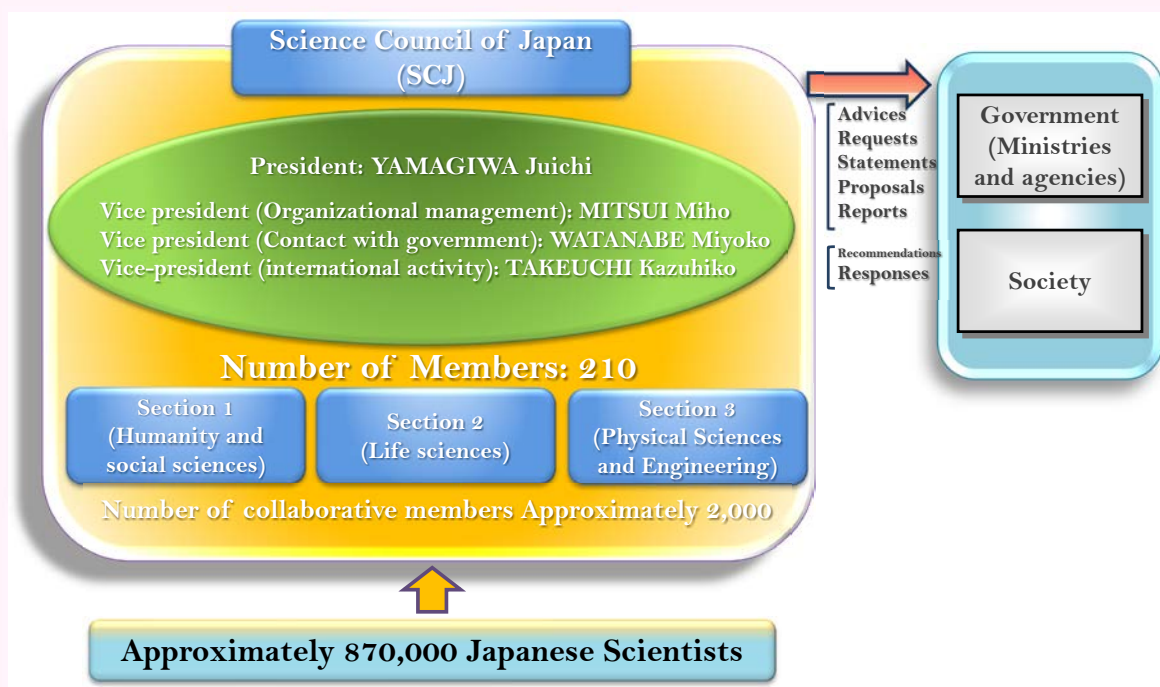
Based on the "Future prospects of the Science Council of Japan" (decided by the expert meeting to think about new prospects of the SCJ in March 2015) the SCJ is working on (1) enhancement of its proposals to the government and society; (2) strengthening and utilization of the networks in science community; (3) strengthening of coordination and communication with actors outside of the community; and (4) enhancement of its function as an academy in the world.

■ Table 2-1-8/Major decisions and reports from Council for Science and Technology (FY2019)

Date of issue	Major Reports
Aug. 27, 2019	<u>Subdivision on R&D Planning and Evaluation</u> [Subcommittee on Space Development and Utilization] Toward participation in moon exploration in international cooperation
Dec. 3, 2019	<u>Subdivision on Resources Research</u> Data update of the Fatty Acids, Standard Tables of Food Composition in Japan (Seventh Revised Edition) in 2019
Sep. 19, 2019	<u>Subdivision on Science</u> [Special Committee on Humanities and Social Science] Co-creation of scientific knowledge around humanities and social science (interim summary)
Jul. 31, 2019	<u>Subcommittee on Basic Research Promotion</u> Toward enhancement of the project to promote strategic creation research (creation of new technology seeds) (summary of studies)
Sep. 25, 2019	<u>Commission on University-Industry Collaboration and Regional R&D</u> [Committee on Promotion of University-Industry-Government Collaboration] On future improvement for further development of industry-academia-government collaboration (summary)
Mar. 26, 2020	<u>Comprehensive Policy Special Committee</u> Implementation of Science, Technology and Innovation Policy aiming at Knowledge-Based Value Creation - To be the world's leading country in realizing Society 5.0 - (final summary)

Source: MEXT

■ Figure 2-1-9/Organizational structure of the Science Council of Japan (SCJ)



Note: As of April 1, 2020

Source: Cabinet Office

In terms of proposals to the government and society, the SCJ announced 13 proposals, 4 reports and 1 response in fiscal 2018 (there were no advices, requests, statements or recommendations) (Table 2-1-10). In addition, the following Statements of the Executive Board of Science Council of Japan were made public: “Request to citizens concerning COVID 19 infection countermeasures and future response by the Science Council of Japan”, “Statement of the Executive Board of Science Council of Japan concerning the revision of The Science and Technology Basic Law” and “Statement of the Executive Board of Science Council of Japan on the balance of ‘working-style reform’ for researchers and securing of free research time.” SCJ set up various committees and conducts deliberations for future publication of recommendations, etc.

The SCJ is also working to strengthen and utilize networks in the scientists’ community including cooperative academic societies (2,064 societies as of the end of fiscal 2019) while at the same time promoting cooperation and communication with parties outside of the community through various symposiums, press conferences and other opportunities.

In addition, the SCJ represents Japan in 44 international academic societies including the International Science Council (ISC) and promotes international academic exchange program. In FY2019 SCJ jointly hosted six international conferences with verbal agreement of the Cabinet, submitted the G-Science Academies' Joint Statements compiled jointly with academies of the G7 member countries to the Prime Minister ABE Shinzo in August 2019 and held the 19th Science Council of Asia (SCA) meeting in the Myanmar in December.

■ Table 2-1-10/Major proposals by the Science Council of Japan (SCJ) (FY2019)

Matters related to this white paper	Proposals	Date of issue	Gist
Development of science and technology policy	Proposal for the 6 th Science and Technology Basic Plan (proposal)	October 31, 2019	The following proposals were made as especially important points for the 6 th Science and Technology Basic Plan by sorting out problems and effects of the existing policies from the viewpoint of academic researchers: (1) drastic expansion of economic support for doctoral course students who will bear the next generation and diversification of their career paths; (2) reconstruction of the grand design of the entire public research funding system to contribute to academic diversity; (3) diversity of the scientific community, and; (4) participation of the scientific community in science and technology policies
Response to economic and social challenges	Urgent proposal concerning measures against tick-borne diseases including Japanese spotted fever and severe fever with thrombocytopenia syndrome (proposal)	September 12, 2019	To address tick-borne diseases including Japanese spotted fever and severe fever with thrombocytopenia syndrome, SCJ conducted survey of living condition of ticks, and proposed prevention measures including carrying and applying tick repellent, and removal of weeds around the venue of Tokyo 2020 Games where risk of infection is believed to be high during the games and camping period.
	Wild animal management in population decline (answer)	August 1, 2019	In response to the request for deliberation from the Ministry of the Environment the following proposals were made: (1) coordinate interagency measures for integrated management and strengthen specialized organizations of local governments; (2) rules and systems for sustainable use of local resources; (3) roles of science, local governments and local communities for comprehensive land use planning including abandoned land; (4) academic research system open to citizens for accumulation and operation of scientific data, and; (5) education program for highly professional human resources who will promote wild animal management rooted in the community

Reinforcing the “fundamentals” for science, technology, and innovation	Multitiered and integrated promotion of genomic/precision medicine (proposal)	July 2, 2019	For reexamination of the Healthcare Policy in the 5 th year after its formulation in 2014, the following proposals were made to present the direction of efficient promotion of genomic medicine: (1) expand genome analysis scale to obtain evidence regarding Japanese people; (2) promote multitiered and integrated research of genomic/precision medicine, and; (3) Develop environment for promotion of genomic/precision medicine.
	Toward construction of sustainable data infrastructure of life science (proposal)	November 18, 2019	For sustainable construction and development of data infrastructure of life science the following proposals were made: (1) mandatory formulation of data sharing policies; (2) formulate database strategy at the time of project planning; (3) unify database centers and develop super computers; (4) develop human resources and education systems and; (5) secure budget and introduce systems in accordance with the increase in data volume and variety.
	Master Plan for the 24 th large-scale academic research plans (Master Plan 2020) (proposal)	January 30, 2020	With the aim of providing a certain guideline for Japan’s large-scale research plans by systematizing a wide range of large-scale research plans of high academic significance, Master Plan 2020 was formulated by compiling large-scale academic plans requested by individual academic fields.
Reformation and function enhancement of abili	University entrance examination that nurtures historical thinking (proposal)	November 22, 2019	With the aim of shifting from cramming knowledge with focus on memorization to history education with focus on thinking, the next Course of National Curriculum Standards removes “World History” from required subjects, and makes a new subject “General History” a required subject while replacing the existing elective subjects with “Explore the World History” and “Explore Japanese History.” As the standardized university entrance examinations are scheduled to start in FY2020, positioning of the new subjects in university entrance examinations is particularly important. Toward the successful reform of high-school history education, the SCJ proposed improvements concerning history subjects chosen for selection of university entrants, while presenting examples of questions that have a good balance between knowledge/skill on one hand and the ability to think, judge and express on the other, bearing in mind the computer-scored test used for the standardized university entrance examinations

Source: Cabinet Office

2 Science and Technology Budgets

The science and technology-related portion of Japan’s initial budget for FY2019 is 4.2377 trillion yen, of which 3.4139 trillion yen is allocated for the general account budget and 823.7 billion yen is allocated for the special account budget. The funds for promoting science and technology, which represent the

principal science and technology-related expenditures in the general account, are 1.3597 trillion yen. The science and technology-related portion of Japan's supplementary budget in FY2019 was 984.4 billion yen, of which 965.9 billion yen was allocated for the general account budget (including 553.1 billion yen in funds for promoting science and technology), and 18.5 billion yen was allocated for the special account budget (As of February 2020). The science and technology budget had been registered based on the judgment of the responsible ministries but the budgets since FY2016 have been using a new calculation method based on a unified standard that uses the content of administrative project review sheets. Changes in the science and technology budget (initial budget) are shown in Table 2-1-11, and science and technology budgets are broken down by ministry in Table 2-1-12.

■ Table 2-1-11/Changes in science and technology budgets

(Unit: 100 million yen)

FY		FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
Item	Science and technology promotion expenditures (A)	13,372	12,857	12,930	13,045	13,175	13,597
	As a % of the previous FY	102.8	96.2	-	100.9	101.0	103.2
	Other research-related budget (B)	17,102	16,610	15,225	15,339	17,340	20,542
	As a % of the previous FY	103.2	97.1	-	100.7	113.0	118.5
Science and technology budget included in the general account budget (C) = (A) + (B)		30,474	29,467	28,155	28,384	30,515	34,139
As a % of the previous FY		103.0	96.7	-	100.8	107.5	111.9
Science and technology budget included in the special account budget (D)		6,039	5,309	7,514	7,497	7,908	8,237
As a % of the previous FY		92.6	87.9	-	99.8	105.5	104.2
Science and technology budget (E) = (C) + (D)		36,513	34,776	35,669	35,881	38,423	42,377
As a % of the previous FY		101.1	95.2	-	100.6	107.1	110.3
General account budget of Japan (F)		958,823	963,420	967,218	974,547	977,128	1,014,571
As a % of the previous FY		103.5	100.5	100.4	100.8	100.3	103.8
General expenditure budget of Japan (G)		564,697	573,555	578,286	583,591	588,958	619,639
As a % of the previous FY		104.6	101.6	100.8	100.9	100.9	105.2

Note: 1) Initial budget amounts are shown.

2) Because figures of FY2016 and after are calculated using a new calculation method based on a unified standard, simple comparison with data in or before FY2015 is not possible.

3) Because of rounding, the cumulative amounts in some columns may not equal the totals.

Source: Adapted by MEXT based on data provided by the Cabinet Office and MOF

Table 2-1-12/Science and technology budgets of each ministry/office/agency

(Unit: 100 million yen)

Item	FY2018 (Initial budget)				FY2018 (Initial budget)				FY2019 (Initial budget)				FY2019 (Initial budget)			
	General account	Science and technology promotion expenditures	Special account	Total	General account	Science and technology promotion expenditures	Special account	Total	General account	Science and technology promotion expenditures	Special account	Total	General account	Science and technology promotion expenditures	Special account	Total
National Diet	11	11	-	11	-	-	-	-	12	11	-	12	-	-	-	-
Cabinet Secretariat	625	-	-	625	167	-	-	167	625	-	-	625	2	-	-	2
Reconstruction Agency	-	-	359	359	-	-	-	-	-	-	312	312	-	-	-	-
Cabinet Office	1,034	781	-	1,034	447	295	-	447	1,203	833	-	1,203	250	130	-	250
National Police Agency (NPA)	22	21	-	22	-	-	-	-	24	21	-	24	0	0	-	0
Consumer Affairs Agency	33	-	-	33	9	-	-	9	31	-	-	31	11	-	-	11
MIC	991	482	-	991	51	8	-	51	1,082	489	-	1,082	141	109	-	141
Ministry of Justice (MOJ)	12	-	-	12	0	-	-	0	12	-	-	12	-	-	-	-
Ministry of Foreign Affairs (MOFA)	165	-	-	165	8	-	-	8	150	-	-	150	36	-	-	36
Ministry of Finance (MOF)	13	10	-	13	-	-	-	-	10	10	-	10	5	5	-	5
Ministry of Education, Culture, Sports and Science (MEXT)	19,814	8,694	1,088	20,902	1,796	1,547	-	1,796	20,783	8,954	1,093	21,876	4,011	3,587	-	4,011
Ministry of Health, Labour and Welfare (MHLW)	1,559	637	138	1,698	71	6	-	71	2,171	639	162	2,333	57	5	-	57
Ministry of Agriculture, Forestry and Fisheries (MAFF)	1,658	949	-	1,658	174	65	-	174	2,000	945	-	2,000	350	129	-	350
Ministry of Economy, Trade and Industry (METI)	1,407	1,054	5,151	6,558	1,274	369	50	1,324	1,560	1,131	5,226	6,786	4,645	1,465	176	4,821
Ministry of Land, Infrastructure, Transport and Tourism (MLIT)	1,754	270	76	1,830	158	55	-	158	2,793	281	127	2,920	88	40	-	88
Ministry of the Environment (MOE)	374	266	1,096	1,470	-	-	212	212	395	282	1,318	1,712	64	61	9	73
Ministry of Defense (MOD)	1,042	-	-	1,042	-	-	-	-	1,290	-	-	1,290	-	-	-	-
Total	30,515	13,175	7,908	38,423	4,156	2,345	262	4,419	34,139	13,597	8,237	42,377	9,659	5,531	185	9,844

Note: 1) Supplementary budget amounts are calculated in a manner not based on a unified standard as in the case of the initial budget, but instead based on the judgment of the responsible ministries.

2) Because of rounding, the cumulative amounts in some columns may not equal the totals.

Source: Adopted by MEXT based on data from the Cabinet Office