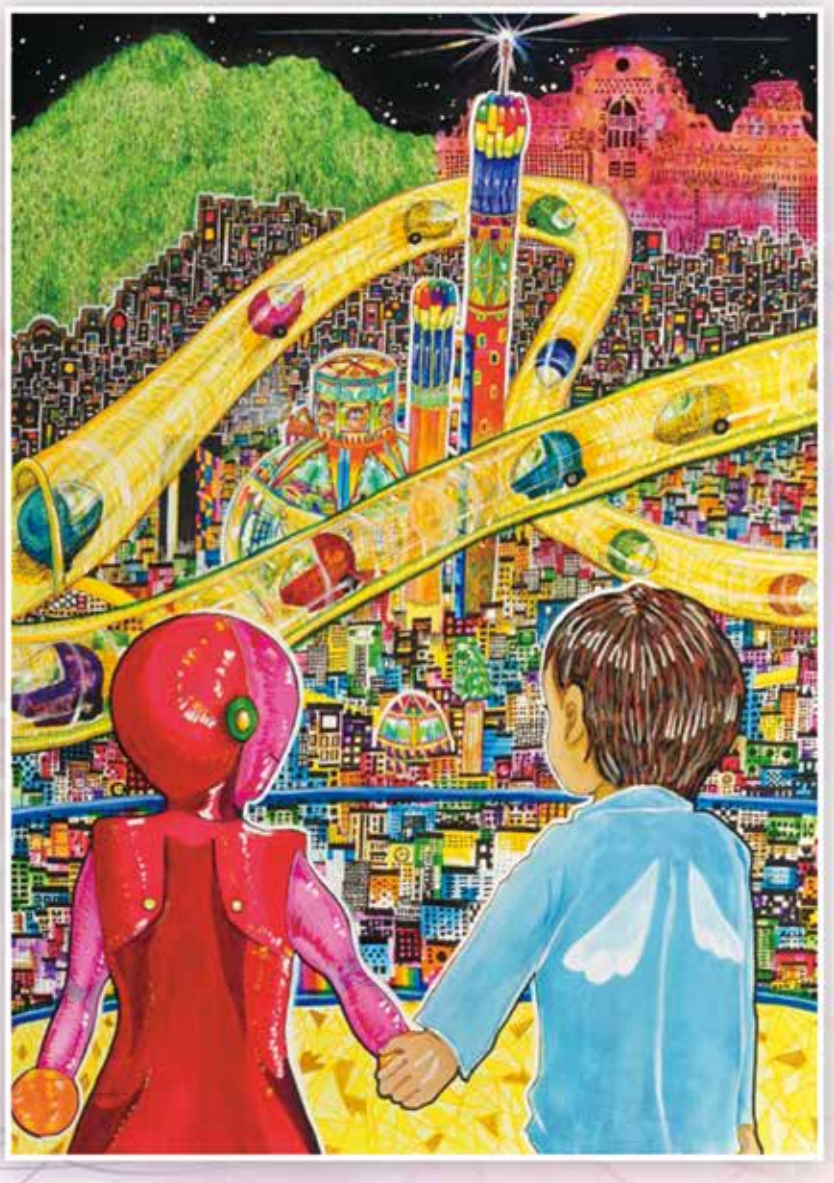
Part II

Measures Implemented to Promote Science and Technology



Part II describes the measures taken to promote science and technology in FY 2017 in accordance with the 5th Science and Technology Basic Plan (January 22, 2016 Cabinet Decision), (Science and Technology Basic Plan; hereinafter: the Basic Plan).

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. 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 next 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 Science and Technology 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 Science and Technology Basic Plan (hereinafter referred to as the 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 5.0[1] 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

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.

independent innovation.

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 governmental R&D investment target has not been achieved since the 2nd Basic Plan. R&D investment by the government has stagnated during the past decade. 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).

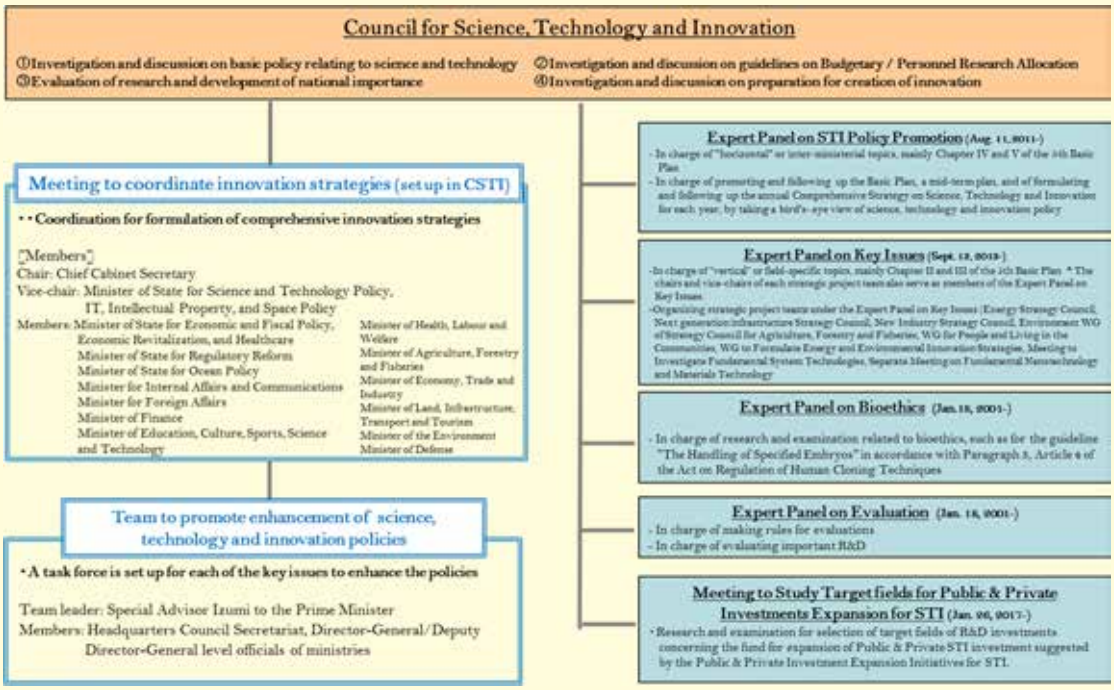
In FY 2017, CSTI has established the Expert Panel on Key Issues and other four expert panels that deliberate on technical aspects of key issues (Figure 2-1-2).

Table 2-1-1 List of CSTI members

Cabinet members	Shinzo Abe	Prime Minister
	Yoshihide Suga	Chief Cabinet Secretary
	Masaji Matsuyama	Minister of State for Science and Technology Policy
	Seiko Noda	Minister of Internal Affairs and Communications
	Taro Aso	Minister of Finance
	Yoshimasa Hayashi	Minister of Education, Culture, Sports, Science and Technology
	Hiroshige Seko	Minister of Economy, Trade and Industry
Experts	Takahiro Ueyama (full-time)	Former Professor and Vice-President, The National Graduate Institute for Policy Studies (GRIPS)
	Yumiko Kajiwara (part-time)	Corporate Executive Officer, Fujitsu Limited Chairman of the Board of Directors, Toyota Motor Corporation
	Motoko Kotani (part-time)	Director, Advanced Institute for Materials Research (AIMR); Prof., Graduate School of Science, Tohoku University
	Yoshimitsu Kobayashi (part-time)	Chairperson of the Director of the Board, Mitsubishi Chemical Holdings Corporation; Chairman of Keizai Doyukai
	Masakazu Tokura (part-time)	Representative Director & President, Sumitomo Chemical Co., Ltd.
	Kazuhito Hashimoto (part-time)	President, National Institute for Materials Science (NIMS) and Special Assistant to the President and Professor, the University of Tokyo
	Juichi Yamagiwa (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 FY2017

CSTI has been discussing policy, budgets and systems. Such discussions address the following: 1) the establishment of the Comprehensive Strategy on Science, Technology and Innovation 2017 (approved on June 2, 2017 by Cabinet Decision), and 2) the operation of the Cross-ministerial Strategic Innovation Promotion Program (SIP) and the Impulsing Paradigm Change through Disruptive Technologies Program (ImPACT).

Specifically, at CSTI meeting on December 25, 2017, Prime Minister issued an instruction that Chief Cabinet Secretary and Minister of State for Special Mission (science and technology policy) in cooperation with relevant ministers shall endeavor to formulate a comprehensive and specific innovation strategy by the summer of 2018. In response, it was decided on January 30, 2018 to hold the Meeting to Promote Comprehensive Innovation Strategy chaired by the Chief Cabinet Secretary and consisting of relevant ministers.

On February 2, 2018, the first Meeting to Promote Comprehensive Innovation Strategy decided to formulate a team to promote enhancement of science, technology and innovation policies. The team is led by the Special Advisor to the Prime Minister and consists of senior officials of Council Secretariats and ministries. In this fashion, the system to develop a comprehensive innovation strategy has been established.

Column 2-1

Key science and technology achievements since the Meiji Period

In early years of Meiji Era, a new government was formed but Japan was still a weak country in the world. Establishing an independent state similar to advanced Western countries was an urgent task at the time. Under the slogan of "enrich the country, strengthen the military" the new government aimed to strengthen industries and military forces by actively introducing advanced technologies. These technologies came to Japan through dispatched Japanese students and employed foreigners. Masaru Inoue who has been called "the father of Japan's railway" learned railway technology in England and contributed to the development of railway business in Japan as the Director of Railways, etc. after returning to Japan. Railway construction started under the technical guidance of employed foreigners in the third year of Meiji (1870) and Japan's first railway started between Shinbashi and Yokohama in 1872. The railway technologies that were mostly introduced from England have been improved in Japan and developed into world-class social infrastructure technologies.

Shinbashi Engine Shed in early years of Meiji
Provided by Railway Museum

Around the 30th year of Meiji, disposal of factories of the Ministries of Engineering and Home Affairs led to the development of industries by private capital. Textile and other light industries developed first, followed by heavy industries including shipbuilding, iron, coal and power industries from around the 40th year of Meiji.

In the Taisho Era, the First World War created an unprecedented economic boom with the rapid increase of exports and prosperity of shipping businesses. In order to develop important industries under the national policy, the state fostered a large number of science and engineering human resources who supported science and technologies after the war. Toward development of industries that were important for the national policy, a large number of science and engineering human

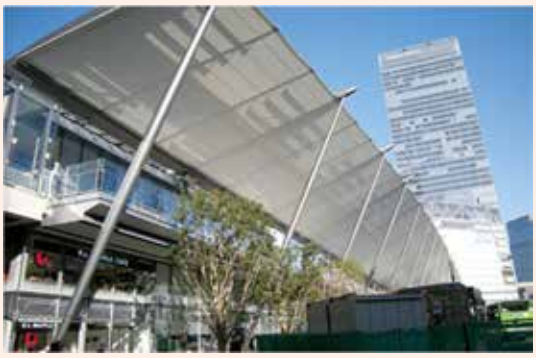
resources were cultivated. After the success of extraction of Vitamin A by agronomist Katsumi Takahasi for the first time in the World in 1922, its mass production technology was established. In 1958 Japan was the world's top country in production, quality and technologies of various medicines containing Vitamin A (night blindness, xerophthalmia and keratomalacia) capturing 60% share in the world.

After the Second World War, around the time when the Science and Technology Agency (1956) and the Council of Science and Technology (1959) were established, the government's innovation policy shifted from inbound open innovation to independent technological development. Lithium-ion batteries are now indispensable for a broad range of electric/electronic devices including smartphones and laptops. After the establishment of the basic concept of the batteries by Akira Yoshino, Japan succeeded in its practical application in 1991 first in the world. There was a period when Japanese major battery manufacturers dominated the market and controlled 90% of the world share.

During the high economic growth period when pollution and other social problems came to the surface, regulations were introduced and environmental standards were set. As a result, science and technologies contributing to overcoming the social problems also developed: desulfuration and other pollution countermeasures and energy-saving measures, for example. The invention of the blue light emitting diode that received the Nobel Prize in 2014 (Isamu Akasaki, Hiroshi Amano, Shuji Nakamura, et al) enabled white LED, which rapidly spread as a light source with low power consumption especially since the power crisis after the Great East Japan Earthquake in Japan. LED lighting is used in various scenes of society including mobile phones, televisions and other appliances and agricultural technologies for cultivation of highly nutritious vegetables. Discovery of the photocatalyst effect (Honda-Fujishima effect) of titanium oxide by Kenichi Honda and Akira Fujishima in 1967 has established a highly weatherproof self-cleaning technology through research continuing for tens of years after the discovery. The technology is widely used for window glasses and mirrors of automobiles, outer walls of buildings and antibacterial tiles of hospitals, for example. Today, research is advanced toward its application in the medical field including cancer treatment and clean energy technology called artificial photosynthesis.

In the modern age Japan aimed to develop its economy through introduction of technologies from foreign countries, but various technologies that were developed in Japan have been widely used in the world and contributed to solutions of social problems during these 150 years. It is expected that our science and technologies will contribute to the realization of Society 5.0 pursued by the country and achievement of SDGs, thus showing their presence in the world.

Grand Central Station lit by LED, New York, U.S.A
Provided by Toshiba Lighting & Technology Corporation



GRANROOF of Tokyo Station with titanium oxide photocatalyst coating
Provided by the University of Tokyo

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 Comprehensive Strategy on Science, Technology and Innovation to be implemented.

(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 Comprehensive Strategy on Science, Technology and Innovation 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 interdisciplinary and inter-ministerial management where the Council for Science, Technology and Innovation 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. The 11 program directors (PDs) play central roles in relevant programs to powerfully promote science, technology and innovation that will be economic growth engine and dramatically change society. According to the CSTI policies, the Cabinet Office budget for the Creating and Promoting Science, Technology and Innovation (FY 2017: 50 billion yen) is intensively allocated to the implementation of the SIP. Health and medicine are promoted under the Headquarters for Healthcare Policy.

Under the SIP the following 11 programs have been selected to contribute to the solution of social problems, enhancement of industry competitiveness and economic reform. The programs will enter their last year in FY2018.

- 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 introduction of renewable energy and thereby create a big market.
- Structural Materials for Innovation (SM^4I)

  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 to create an ocean resource surveying industry.
- Automated Driving System

  Realize an advanced automated driving system, including its development to 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 will be promoted, adhering to the current SIP concept in principle toward realization of Society 5.0 (see Chapter 7 Section 4.4).

- Fundamental cyberspace technologies (core project of PRISM fundamental cyberspace technologies) "Fundamental cyberspace technologies using big data and AI[1]"
- Fundamental physical space technologies (core project of PRISM fundamental physical space technologies) "Fundamental digital data processing technologies in physical space"
- Security (Cyber and physical security) "Cyber and physical security matching an IT society"
- Automatic traveling "Automatic driving (practical application of systems and services)"
- Material development infrastructure "Materials revolution through an integrated materials development system"
- Optical and quantum technology platform "Society 5.0 realization technology using photon/quantum"
- Bio and agriculture "Core technologies for Smart Bio-industry and Agriculture"
- Energy and the environment "Energy system for realization of a decarbonized society"
- Disaster prevention/mitigation (core project of the PRISM disaster prevention/mitigation technologies) "Enhancement of national resilience (disaster prevention/mitigation)"
- Health and Medical Care: "Advanced diagnosis and treatment system at AI hospitals"
- Physical distribution: "Smart material distribution service"
- Ocean: "Innovative deep sea resource survey technology"

1 Artificial Intelligence

(3) Promotion of the Impulsing Paradigm Change through Disruptive Technologies (ImPACT) Program

The ImPACT Program for high-risk, high-impact, innovative R&D is being promoted to create STI that will bring significant changes to industry and society if it is realized.

16 program managers (PM) who have been given major authority and responsibility for planning, promoting and managing R&D implemented R&D programs based on their respective R&D plans.

3 R&D Evaluation of Projects of National Importance

For comprehensive and plan-based promotion of the nation's science and technology policy, the Council for Science, Technology and Innovation (CSTI) implements evaluation of R&D projects of national importance including large-scale R&D[1] implemented by individual ministries based on Article 26 paragraph (1)(iii) of the Act for Establishment of the Cabinet Office (Act No. 29 of 2016). 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 Science and Technology 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) Ex-post Evaluation of Large-Scale R&D Projects (approved and reported on April 21, 2017)

CSTI conducted an ex-post evaluation of the completed large-scale R&D project ALMA (MEXT), which had been subject to preliminary evaluation by the Council for Science and Technology Policy (CSTP), and CSTI sent the evaluation results to the Minister of MEXT, who is in charge of that project.

(2) Revision of the "Evaluation of R&D Projects of National Importance Implemented by the Council for Science, Technology and Innovation (decided on October 18, 2005)" (partially revised on July 26, 2017)

CSTI partially revised the "Evaluation of R&D Projects of National Importance Implemented by the Council for Science, Technology and Innovation (July 26, 2017).

(3) Ex-ante Evaluation of Large-Scale R&D Projects (approved and notified on December 25, 2017)

A large-scale R&D project "development of AI chips and next-generation computing technologies that will enable highly efficient and high-speed processing" was decided to be implemented by METI in the FY2018 budget demand. CSTI conducted ex-ante evaluation of the project and notified the result to the Minister of METI, who holds jurisdiction over the project.

(4) Interim Evaluation of Large-Scale R&D (approved and notified on December 25, 2017)

CSTI conducted an interim evaluation of the large-scale R&D project "Subsides for Integrated Coal

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.

Gasification Fuel Cell Combined Cycle Demonstration Project" that started in FY2011, on the consideration that the project will enter a new R&D stage. The evaluation result was notified to the Minister of METI, who holds jurisdiction over the project.

(5) CSTI's opinion on estimation evaluations, etc., at the end of the period for medium to long-term objectives of Designated National Research and Development Agencies (approved and notified on December 1, 2017)

CSTI decided its opinion on the estimation evaluation, etc. for the medium to long-term objectives of the Institute of Physical and Chemical Research (RIKEN) at the end of the period (FY2017). The opinion was sent to the Minister of MEXT, who holds jurisdiction over the project.

(6) CSTI's opinion on the next medium- to long-term objectives (draft) of Designated National Research and Development Agencies (report) (decided and reported on February 23, 2018)

CSTI reported its opinion on the next medium to long-term objectives (draft for the period from April 2018 to March 2025) of RIKEN in response to the inquiry made by the Minister of MEXT.

4 Major Deliberations at Expert Panels

(1) Undertakings toward setting of priority areas for promotion of public-private investment expansion

The "Public and Private Investment Expansion Initiative for Science and Technology Innovation (final report)" suggested the target fields of the budget for expansion of Public and Private Investment for Science and Technology Innovation (the budget is to be established by fiscal 2018). The "Committee for Studying Target Fields of Expenditure to Expand Public and Private Investment for Science and Technology Innovation" started its studies in February 2017. In April of the same year the Committee selected innovative fundamental cyberspace technologies (AI, IoT and big data), innovative fundamental physical space technologies (sensors, actuators, processing devices, robotics and optical and quantum technologies), innovative construction and infrastructure maintenance technologies and innovative disaster prevention/mitigation technologies as target fields for preparation assuming they will be set up in FY2018.

(2) Expert Panel on STI Policy Promotion

The Expert panel on STI policy promotion carried out surveys and studies on matters pertaining to promotion of basic science and technology policies and programs in order to ensure promotion of the policies and programs in line with the 5th Basic Plan and the Comprehensive Strategy on Science, Technology, and Innovation.

(3) Expert Panel on Key Issues

The Panel carried out investigations, examinations, etc. of the initiatives to build common bases and solve economic and social problems toward realization of Society 5.0 included in the Fifth Basic Plan and the Comprehensive Strategy on Science, Technology, and Innovation.

(4) Expert Panel on Evaluation

The Expert Panel on Evaluation conducted one ex-ante evaluation, one interim evaluation and one ex-post evaluation of large R&D development projects in FY 2017 and compiled the respective results. In addition, the panel compiled CSTI's opinion on estimation evaluations, etc., at the end of the period for medium to long-term objectives of a Designated National Research and Development Agency (RIKEN) (draft) and the draft revision of the "Evaluation of R&D Projects of National Importance Implemented by the Council for Science, Technology and Innovation."

(5) Expert Panel on Bioethics

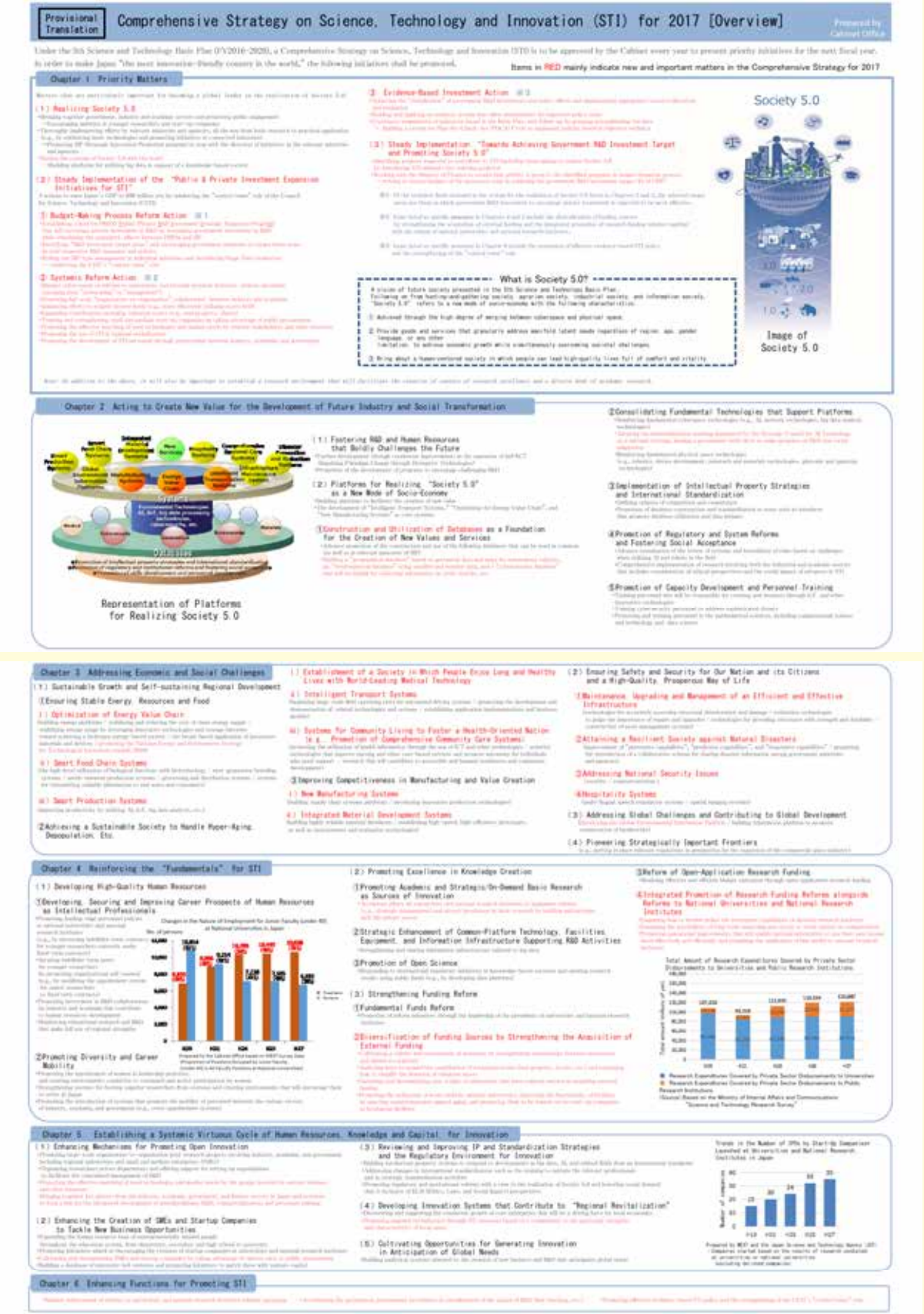
In order to deepen discussion on research that uses genome editing technology for human fertilized embryo, the Expert Panel on Bioethics set up a task force for review, etc. of "the Basic Idea on the Status of Human Embryo" and compiled a report on the review, etc. of "the Basic Idea on the Status of Human Embryo – 1: use of genome editing technologies for research on assisted reproductive technology". The Panel will continue to deepen discussions on such research.

Section 3 Comprehensive Strategy on Science, Technology and Innovation

Based on the medium- to long-term policy direction set forth in the Basic Plan, and considering the changes in the situation after the formulation of the plan, the Council for Science, Technology and Innovation (CSTI) formulates a Comprehensive Strategy on Science, Technology and Innovation every year showing initiatives to be prioritized in the fiscal year. The Comprehensive Strategy on Science, Technology and Innovation 2017 was established in June 2017 (Figure 2-1-3).

The Comprehensive Strategy on Science, Technology and Innovation 2017 contains initiatives to be prioritized from FY2017 to FY2018 based on the Fifth Basic Plan. Especially important matters are picked up in "Chapter 1 Priority Matters" while matters corresponding to the policy pillars of the Fifth Basic Plan and reinforcement of functions to promote science and technology innovations are described from Chapter 2 to Chapter 6.

Figure 2-1-3 Outline of the Comprehensive Strategy on Science, Technology and Innovation



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 Education, Culture, Sports, Science and Technology, and also offers its views to the minister.

Table 2-1-4 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 2-1-5).

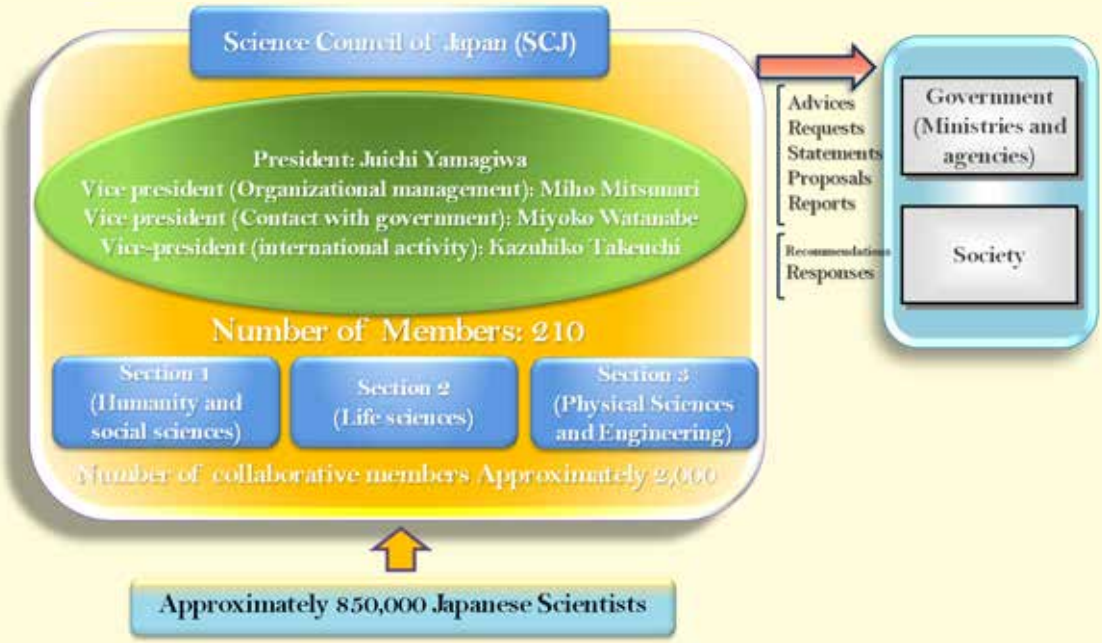
Based on the "Future prospects of the Science Council of Japan" (decided by the expert meeting to think about new prospects of the Science Council of Japan in March 2015) the SCJ is working on (1) enhancement of its proposals to the government and society; (2) strengthening and utilization of the networks 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 2-1-4 Major decisions and reports from Council for Science and Technology (FY 2017)

Date of issue	Major Reports
	General Meeting
Mar. 23, 2018	Basic policy for understanding and analysis of the progress of the Fifth Science and Technology Basic Plan at MEXT (Decision)
	Subdivision on Research Planning and Evaluation
Aug. 21, 2017	Partial revision of the research and development plan
	Subdivision on Resources Research
Dec. 22, 2017	Standard tables of food composition in Japan 2015 (Seventh Revised Edition) Supplementary edition 2017
	Amino Acids, Standard Tables of Food Composition in Japan 2015 Supplementary edition 2017
	Fatty Acids, Standard Tables of Food Composition in Japan (Seventh Revised Edition) Supplementary edition2017
	Available Carbohydrates, Polyols and Organic Acids, Standard Tables of Food Composition in Japan (Seventh Revised Edition) Supplementary edition 2017
	Subdivision on Science
Oct. 27, 2017	Development of an international research environment in joint use/research centers (sorting opinions) [Research Environmental Base Section]
	Geodesy Subcommittee
Jul. 13, 2017	Outside evaluation report on "the earthquake/volcano observation and research plan to contribute to disaster mitigation"

Source: MEXT

Figure 2-1-5 Organizational structure of the Science Council of Japan (SCJ)



Note: As of October 2, 2017
Source: Cabinet Office

In terms of proposals to the government and society, the SCJ announced 49 proposals and 35 reports in fiscal 2017 (there were no advices, requests, statements, recommendations or responses). The council has set up various committees that are conducting deliberations toward publication of proposals, etc. (Table 2-1-6).

In order to discuss what relationship academia should have with security-related matters, the SCJ set up the Committee on National Security and Scientific Research. Based on the discussions at the committee, the SCJ published the Statement on Research for Military Security on March 24, 2017, and the Report on Research for Military Security on April 13, 2017. Further in February 2018, SCJ conducted a questionnaire survey at the Committee for Scientific Community in order to investigate how the statement was regarded by universities and other research institutions.

In order to clarify the current state of basic medical research and clinical application of genome editing technologies in Japan and deliberate their usefulness and ethical issues, the SCJ set up the Committee to Discuss Approaches to Genome Editing Technologies in the Medical Field in May 2016. The committee held twelve meetings and open symposiums up until FY2017. Based on these discussions SCJ published "Approaches to Genome Editing Technologies in the Medical Science and Treatment in Japan" on September 27, 2017.

The SCI is also working to strengthen and utilize networks in the scientists' community including cooperative academic societies (2,024 societies as of the end of fiscal 2017) while at the same time promoting cooperation and communication with parties outside of the community through various symposiums, science cafes, press conferences and other opportunities. In response to the Kumamoto Earthquake in 2016, for example, the SCJ in cooperation with relevant academic societies held emergency joint press conferences and briefing sessions.

In addition, the council represents Japan in 45 international academic societies including the International Council for Science (ICSU) to promote international academic exchange. In FY2017 SCJ jointly hosted five international conferences with verbal agreement of the Cabinet, submitted the G-Science Academies' Joint Statements compiled jointly with academies of the member countries to the Prime Minister in May and held the 17th Science Council of Asia (SCA) meeting in the Philippines and International Conference on Science and Technology for Sustainability 2017 in June and November respectively.

Table 2-1-6 Major proposals by the Science Council of Japan (SCJ) (FY 2017)

Matters related to this white paper	Proposals	Date of issue	Gist
Addressing economic and social challenges	Recommendation concerning the resident status of evacuees from the nuclear accident accompanying the Great East Japan Earthquake (Proposals)	September 29, 2017	Recognizing the continuing importance of a system that enables residents who evacuated as a result of the TEPCO's Fukushima Daiichi Nuclear Power Plant accident to maintain their relationship with the local governments of the place where they lived before the evacuation and the place where they are living now (double status) SCJ recommended establishment of a new system to respect their choice and maintain the double relationships.
	Academic investigations and research activities on the Great East Japan Earthquake – achievements, challenges and proposals – (Proposals)	September 29, 2017	With the aim of obtaining suggestions and drawing lessons on approaches to academic investigations and research activities on major disasters, "Survey on academic investigations and research activities concerning the Great East Japan Earthquake" of field researchers was conducted. Based on the basic tallying and summary of characteristics by discipline, SCJ recommended: (1) sharing and archiving of data related to the Great East Japan Earthquake, (2) establishment of funds in preparation for large-scale disasters, and (3) development of a unified system that can respond to large-scale complex disasters.
Reinforcing the "fundamentals" for science, technology, and innovation	Recommendation concerning the ideal research fund system contributing to comprehensive academic development and innovation of society (Proposals)	August 22, 2017	With focus on the need for comprehensive government support for improvement of research capabilities and establishment of a research system based on the industry-academia collaboration, SCJ recommended: (1) expansion of public funds to universities and research institutions, (2) well-balanced distribution of competitive funds, (3) enhancement of cultivation of young/female researchers, (4) promotion of industry-academia joint research, (5) expansion in scale of joint research through cooperation across organizations (6) improvement of cost concept and enhancement of indirect expenses in industry-academia joint research and (7) improvement of research facilities and equipment and promotion of their joint use.
Deepening the relationship of science and technology innovations with society	Genome Editing Technology in Medical Sciences and Clinical Applications in Japan (Proposals)	September 27, 2017	Rapidly progressing genome editing technology is expected to develop treatments for intractable genetic diseases, but in its application to assisted reproductive technology, grave medical and ethical concerns are pointed out including unforeseen adverse effects to newborn babies. To address the issue SCJ recommended strict regulations which include a temporary ban on clinical applications of assisted reproductive technology using genome editing and regulation of basic research involving genome editing of human reproductive cell/fertilized embryo based on social understanding and transparency.
Reform and strengthening of functions of universities	Education and research reform of national universities and support by the government – for development of the foundation of learning promotion – (Proposals)	June 27, 2017	In order to further enhance the value of research and education organizations full of creativity by using accumulated knowledge assets and also to advance basic research, university-corporate relations, community-based research and human resource development, SCJ recommended (1) promotion of self-reform of national universities and strengthening of long-term and continuous investment, (2) strengthening of cooperation among national universities using information communication technologies, (3) promotion of human resource development and academic research at national universities, (4) national universities' contribution to the communities, and (5) promotion of humanities and social sciences at national universities.

2 Science and Technology Budgets

The science and technology-related portion of Japan's initial budget for FY2017 is 3.5880 trillion yen, of which 2.8383 trillion yen is allocated for the general account budget and 749.7 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 1.3045 trillion yen. The science and technology-related portion of Japan's supplementary budget in FY 2017 was 373.5 billion yen, of which 360.6 billion yen was allocated for the general account budget (including 151.3 billion yen in funds for promoting science and technology), and 12.9 billion yen was allocated for the special account budget (As of March 2018). The science and technology budget had been registered based on the judgment of the responsible ministries but the initial budgets since fiscal 2016 were recalculated based on a unified standard using the content of administrative project review sheets. Changes in the science and technology budget (initial budget) are shown in Table 2-1-7, and science and technology budgets are broken down by ministry in Table 2-1-8.

Table 2-1-7 Changes in science and technology budgets

(Unit: 100 million yen)

Item \ FY		FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2016
	Science and technology promotion expenditures (A)	13,135	13,007	13,372	12,857	12,930	13,045
	As a % of the previous FY	98.4	99.0	102.8	96.2	-	100.9
	Other research-related budget (B)	16,728	16,571	17,102	16,610	15,225	15,338
	As a % of the previous FY	97.2	99.1	103.2	97.1	-	100.7
Science and technology budget included in the general account budget (C) = (A) + (B)		29,863	29,578	30,474	29,467	28,155	28,383
As a % of the previous FY		97.7	99.0	103.0	96.7	-	100.8
Science and technology budget included in the special account budget (D)		7,063	6,520	6,039	5,309	7,514	7,497
As a % of the previous FY		116.1	92.3	92.6	87.9	-	99.8
Science and technology budget (E) = (C) + (D)		36,927	36,098	36,513	34,776	35,669	35,880
As a % of the previous FY		100.8	97.8	101.1	95.2	-	100.6
General account budget of Japan (F)		903,339	926,115	958,823	963,420	967,218	974,547
As a % of the previous FY		97.8	102.5	103.5	100.5	100.4	100.8
General expenditure budget of Japan (G)		517,957	539,774	564,697	573,555	578,286	583,591
As a % of the previous FY		95.8	104.2	104.6	101.6	100.8	100.9

Note: 1) Initial budget amounts are shown.
2) Because figures of FY2016 and after are results of the recalculation based on a unified standard, simple comparison with data in or before FY2015 is not possible. The change in the total amount due to recalculation is a 99.5 billion yen increase for FY2016 and an 89.3 billion yen increase for FY2017.
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 (as of March 2018)

Table 2-1-8 Science and technology budgets of each ministry/office/agency

(Unit: 100 million yen)

Item / Ministry/Office/Agency	FY2016 (Initial budget)				FY2016 (Supplementary budget)				FY2017 (Initial budget)				FY2017 (Supplementary 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	-	-	-	-	11	11	-	11	-	-	-	-
Cabinet Secretariat	623	-	-	623	175	-	-	175	624	-	-	624	135	-	-	135
Reconstruction Agency	-	-	356	356	-	-	1	1	-	-	289	289	-	-	-	-
Cabinet Office	859	689	-	859	646	598	-	646	868	689	-	868	715	625	-	715
National Police Agency (NPA)	21	21	-	21	-	-	-	-	23	23	-	23	-	-	-	-
Consumer Affairs Agency	29	-	-	29	-	-	-	-	33	-	-	33	-	-	-	-
MIC	896	404	-	896	83	37	-	83	918	451	-	918	93	61	-	93
Ministry of Justice (MOJ)	12	-	-	12	6	-	-	6	12	-	-	12	-	-	-	-
Ministry of Foreign Affairs (MOFA)	176	-	-	176	-	-	-	-	153	-	-	153	4	-	-	4
Ministry of Finance (MOF)	13	10	-	13	-	-	-	-	13	9	-	13	5	5	-	5
Ministry of Education, Culture, Sports and Science (MEXT)	19,444	8,635	1,095	20,539	1,397	863	-	1,397	19,463	8,674	1,095	20,558	590	444	-	590
Ministry of Health, Labour and Welfare (MHLW)	1,368	677	127	1,495	104	65	-	104	1,386	673	137	1,523	35	27	-	35
Ministry of Agriculture, Forestry and Fisheries (MAFF)	1,278	984	-	1,278	128	127	-	128	1,264	984	-	1,264	129	70	-	129
Ministry of Economy, Trade and Industry (METI)	1,315	979	4,832	6,147	1,337	504	3	1,340	1,320	1,010	4,943	6,263	1,862	253	121	1,983
Ministry of Land, Infrastructure, Transport and Tourism (MLIT)	721	272	19	740	44	34	-	44	724	265	36	760	28	20	-	28
Ministry of the Environment (MOE)	349	248	1,078	1,427	14	13	-	14	362	255	997	1,359	10	9	8	17
Ministry of Defense (MOD)	1,060	-	-	1,060	-	-	-	-	1,222	-	-	1,222	-	-	-	-
Total	28,173	12,930	7,508	35,682	3,933	2,241	4	3,938	28,395	13,045	7,497	35,892	3,606	1,513	129	3,735

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 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