

Chapter 1

Development of Science and Technology Policies

1 The Science and Technology Basic Plan

The Third Science and Technology Basic Plan (Cabinet decision: March 2006) prescribes basic and comprehensive measures for promoting science and technology in Japan for the period from FY 2006 to FY 2010 based on the Science and Technology Basic Law (Law No. 130, effective on November 15, 1995).

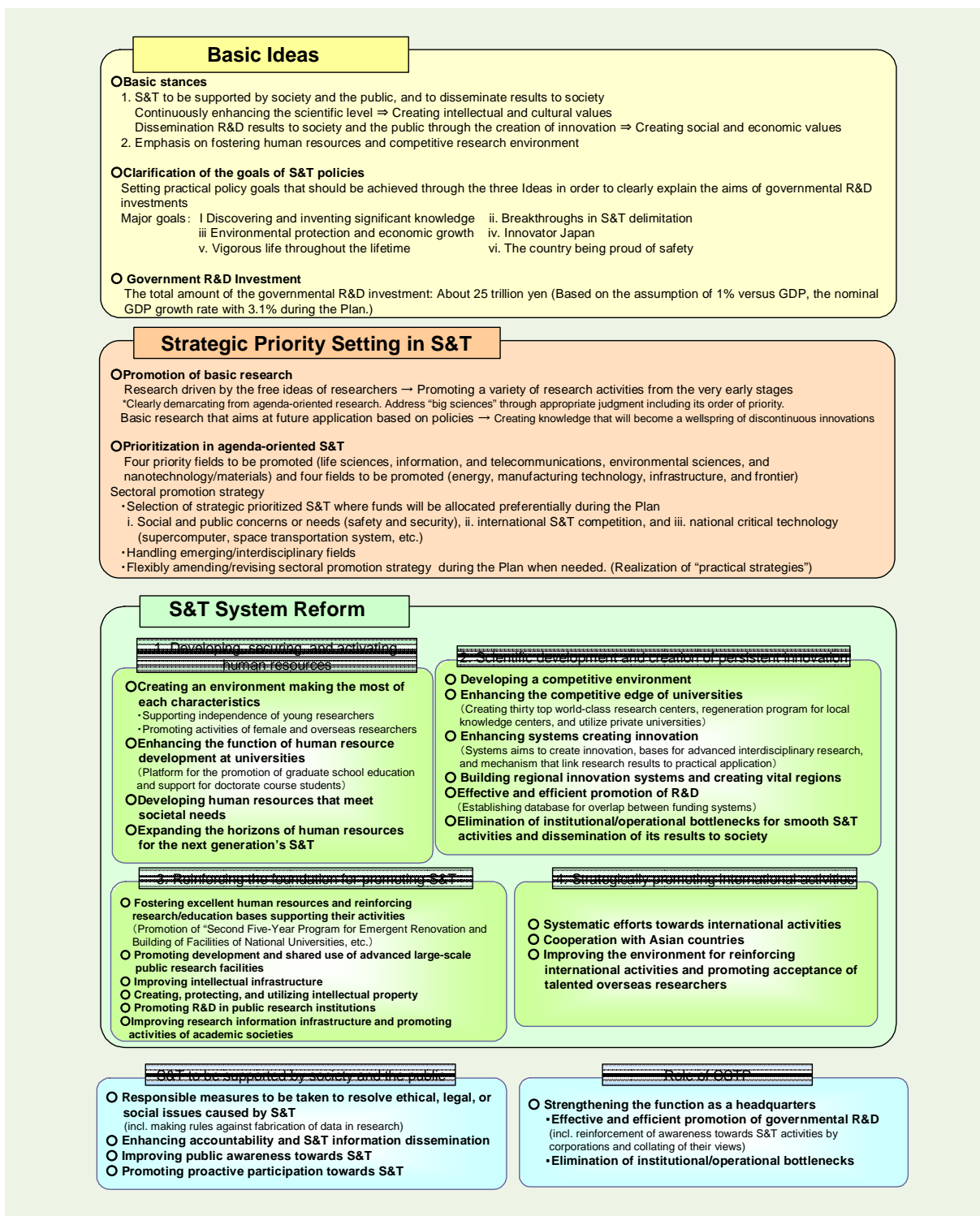
Science and technology is the platform that supports the economic society of Japan, and its role is increasingly expanding in recent years to overcome the global problems of an aging population combined with the decreasing birth rate, issues on safety and security, and environmental issues. During the five-year period of the Plan for responding to such expectations by utilizing investments in S&T accumulated in the past, it is mandatory to develop human resources and a competitive environment capable of producing research outcomes of high quality, invest strategically in the development of science and the creation of persistent innovation, and eliminate the systematic and operational bottlenecks to disseminate the results to society.

For this purpose, the Plan designates the two basic positions of S&T supported by the public to benefit society and emphasis on fostering human resources and competitive research environments—the shift of emphasis from hard to soft, such as human resources; the greater significance of individuals at institutions and defines the six major objective goals targeted by the S&T policies. In order to achieve them, the Plan conducts prioritization in the respective fields by emphasizing basic research and selecting Strategic Prioritized S&Ts.

Furthermore, the Plan stipulates the target of retaining the ratio of government R&D investments to GDP to the level of the US and major European countries during its five-year period. Specifically, a total of about 25 trillion yen in government R&D investments is required in the same timeframe (based on the presumption that government R&D investments will be 1% of GDP, with a nominal GDP growth rate of 3.1%.) (Figure 2-1-1)

Figure 2-1-1

Outline of the Third Science and Technology Basic Plan (FY2006-2010)



Upon the budgetary process for each fiscal year, it has been decided to retain the expenses necessary for the promotion of measures described in the Plan with the aim of maximizing the effect of government investments by considering the social and economic trends in the future and by steadily implementing S&T system reform under the status of budget constraints.

2 The Council for Science and Technology Policy

The Council for Science and Technology Policy (CSTP) is the headquarters for the strong promotion of S&T policies under the leadership of the Prime Minister. The Council was established within the Cabinet Office as one of the Policy Councils on Key Policy Fields together with the Council on Economic and Fiscal Policy at the reorganization of government ministries and agencies in January 2001. Overseeing all of the nation's S&T, CSTP formulates and coordinates overall comprehensive and basic policies. As a general rule, the Council, chaired by the Prime Minister, meets once a month with attendance by relevant ministers and executive members (Table 2-1-2). In addition, under the Council, five expert panels, including the Expert Panel on Basic Policy Promotion, were established as of March 2008 to promptly seek expert opinions on important matters (Figure 2-1-3).

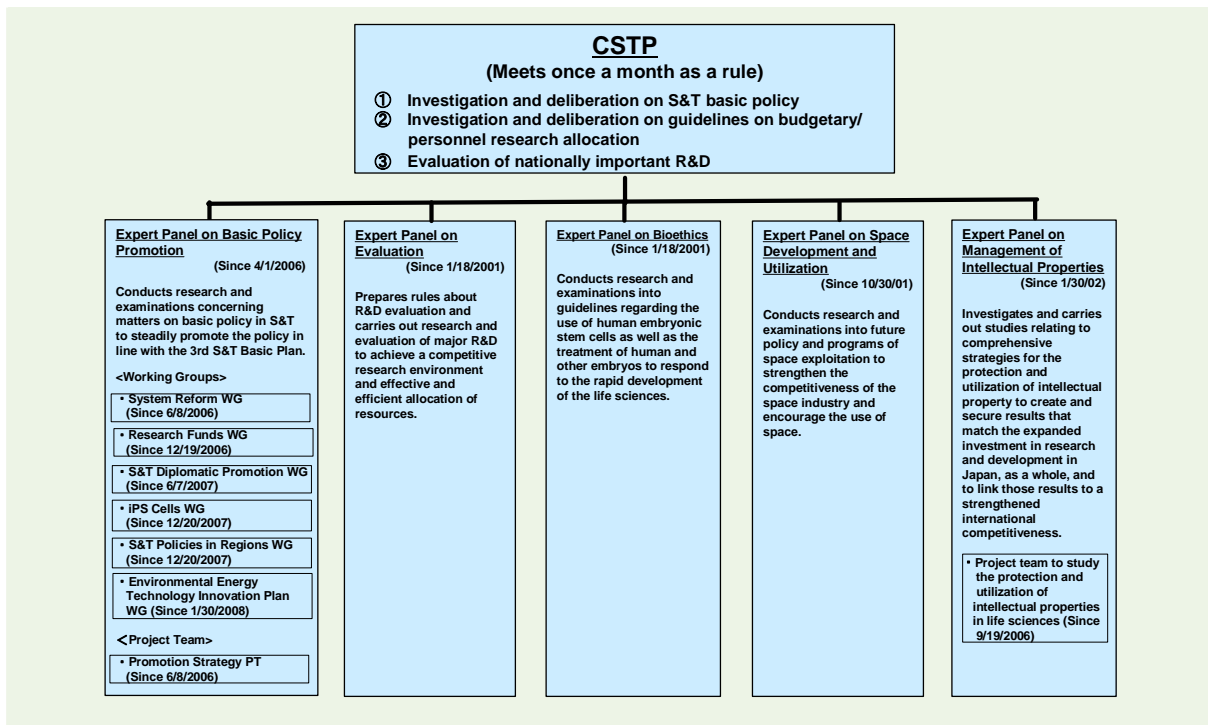
Table 2-1-2

CSTP Membership Roster (As of March 2008)

Chair Cabinet Members	Mr. Yasuo Fukuda	Prime Minister	
	Mr. Nobutaka Machimura	Chief Cabinet Secretary	
	Mr. Fumio Kishida	Minister of State for Science and Technology Policy	
	Mr. Hiroya Masuda	Minister of Internal Affairs and Communications	
	Mr. Fukushiro Nukaga	Minister of Finance	
	Mr. Kisaburo Tokai	Minister of Education, Culture, Sports, Science, and Technology	
	Mr. Akira Amari	Minister of Economy Trade, and Industry	
Executive Members	Dr. Masuo Aizawa	Former President, Tokyo Institute of Technology	Engineering (Biotechnology)
	Dr. Taizo Yakushiji	Visiting Professor, Keio University	Political Science
	Dr. Tasuku Honjo	Visiting Professor, Kyoto University	Medicine (Immunology)
	Dr. Naoki Okumura	Former Representative Director and Executive Vice President, Nippon Steel Corporation, Ltd	
	Dr. Mitiko Go	President, Ochanomizu University	Science (Biophysics)
	Mr. Sadayuki Sakakibara	President, Toray Industries, Inc.	
	Dr. Yoko Ishikura	Professor, Graduate School of International Corporate Strategy, Hitotsubashi University	Economics
Science Council	Dr. Ichiro Kanazawa	President, Science Council of Japan	

Figure 2-1-3

CSTP Organizational Chart



1 Major Measures Implemented in CSTP in FY 2007

(1) Reinforcement of S&T diplomacy

CSTP set up the S&T Diplomatic Promotion Working Group under the Expert Panel on Basic Policy Promotion in June 2007. The WG studied measures to reinforce Japan's S&T diplomacy and issued an interim report for the G8 Hokkaido Toyako Summit to be held in July 2008.

(2) Improvement of competitive funds and promotion of systematic reform

To cultivate the competitive environment for research, promote basic research, and create innovation, the improvement of competitive funds and reform to improve efficiency are urgent matters. For this purpose, CSTP presented the following measures to be implemented for the improvement of competitive funds and the promotion of systematic reform: assurance of versatility and sustainability of basic research that fructifies into innovation and the establishment of a seamless mechanism to reach existing goals; creation of attractive research environment for young and female researchers; reinforcement of high-risk research with impact and ingenious research; reinforcement of evaluation systems; and establishment of fair, transparent, and efficient allocation and use of systems maximizing the effects of research funds.

(3) Review of independent administrative institutions for R&D

The Independent administrative institutions for R&D (hereinafter referred to as "R&D institutions") are the core institutions with R&D functions that a nation is expected to have and are necessary in order for the nation to resolve R&D policy issues. From the viewpoints of reinforcing R&D capabilities and realizing efficient R&D systems of Japan, CSTP defined the roles of the R&D

institutions and suggested measures for further enhancing R&D capabilities, including a clear reflection of national strategies on the activities of R&D institutions, assurance of excellent human resources, and mobility of human resources engaged in research beyond the R&D institutions' framework.

(4) Reform of research systems at universities and graduate schools

In recent years, international circulation of excellent human resources is rapidly developing. A synergic effect of globalization of researchers and improvement in the levels of research is being produced where excellent human resources from around the world meet in universities and graduate schools with higher international competitiveness in research, thereby further increasing the levels of research and international competitiveness. CSTP indicated measures for enhancing international competitiveness in research at universities and graduate schools in Japan, including the promotion of the globally favorable circulation of excellent human resources by guaranteeing international competitiveness in the quality of researchers through diversification of career path programs and the establishment of a globally attractive research environment foundation through the flexible organization of graduate courses and seamless support according to the progress of research.

(5) Regional revitalization through S&T

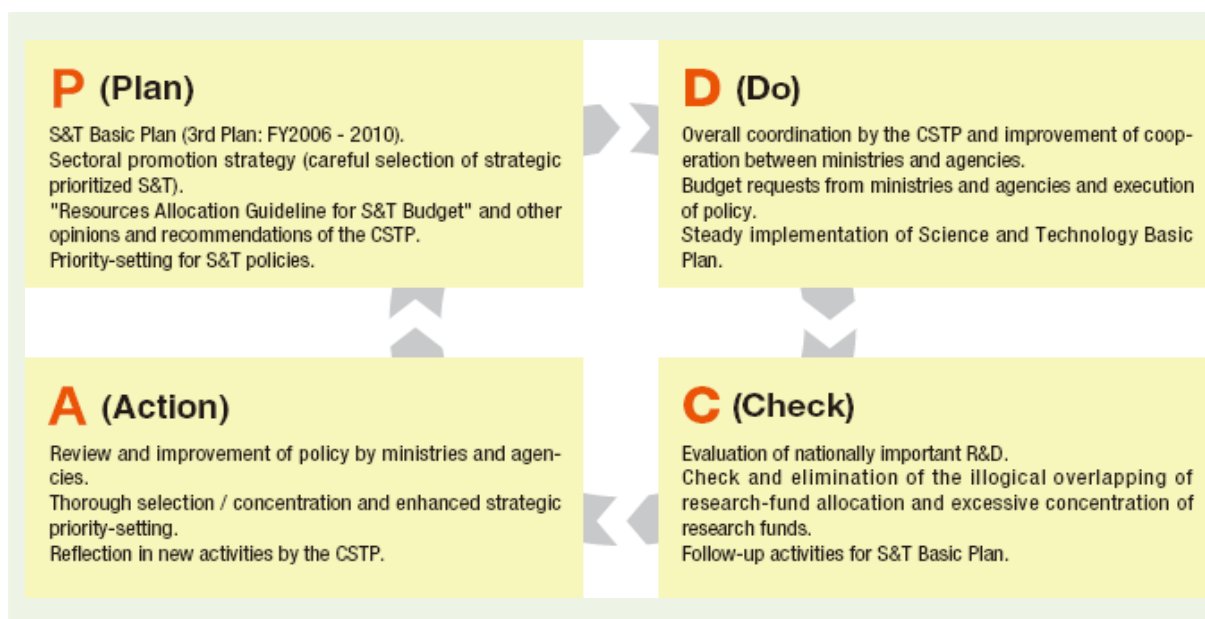
The Third Science and Technology Basic Plan refers to the need for the promotion of S&T in regions, which contributes to building local innovation systems and to creating vital areas. It also positions the promotion of efforts for creating vigorous local communities, such as support for the vitalization of local industries and the formation of industrial clusters as an urgent issue in the long-term strategic guidelines Innovation 25 (Cabinet decision: June 1, 2007). For this purpose, based on the current S&T policies in regions, CSTP defined the basic concept of the government for comprehensive and strategic actions for strongly promoting the creation of innovation in regions, and indicated urgent subjects to be worked on in the future as soon as possible, including the switchover to S&T policies led mainly by regions and the reinforcement of local universities. In addition, the S&T Policies in Regions WG was set up under the Expert Panel on Basic Policy Promotion in December 2007 and started discussions for finalizing the Promotion Strategy for S&T Policies in Regions (provisional title).

2 Setting of Strategic Priorities and Comprehensive Promotion of S&T Measures

CSTP intends to improve the quality of S&T measures through the PDCA cycle, as well as by enhancing its effort to further improve the S&T budget to further enhance Japan's S&T competitiveness. With the background that the Plan enters the interim year in FY 2008, the Council started efforts to implement the setting of strategic priorities by selection and concentration based on past achievements, to ensure that truly important R&D are steadily implemented, and that the achievements of such R&D will be broadly disseminated to society and the public (Figure 2-1-4).

Figure 2-1-4

Conceptual Diagram of the PDCA Cycle to Improve the S&T Budget



(1) Resource Allocation Guidelines for the S&T Budget in FY 2008 (Decision/supplementary recommendation: June 14, 2007)

Based on the Plan and the promotion strategy, the Resource Allocation Guidelines for the S&T Budget in FY 2008, which clarifies the issues to be addressed intensively in FY 2008, was decided, and opinions were offered to the Prime Minister and the relevant ministers.

The guidelines refer to the reinforcement of strategic prioritized S&T, including national critical technology, as important issues to be selectively executed in 2008. It also referred to the promotion of the Pioneering Projects for Accelerating Social Return to ensure that the public can actually experience R&D results, investments in human resources for the next generation, and the development of S&T diplomacy as efforts to strongly promote the creation of innovation.

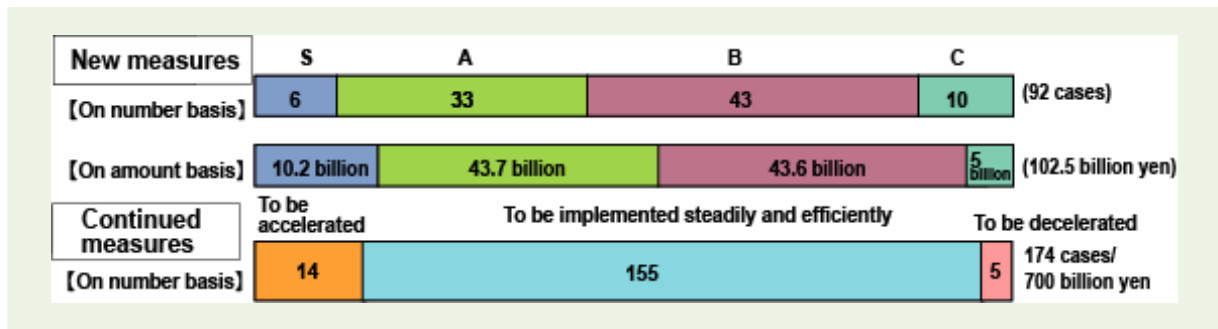
(2) Prioritization of S&T measures (October 2007)

In order to concentrate on truly important measures with respect to the allocation of resources, priorities were established on S&T measures for which individual ministries and agencies had made budget requests through interviews with them to make a detailed check of the content of these measures or by obtaining advice from external experts, based on the aforementioned guidelines.

For execution of the measures, the evaluations for the new measures were precisely selected, and as for the continuous ones, plans that should be accelerated were selected from the viewpoint of a long-term plan in terms of S&T. The execution methods were restructured so that the balance of measures can be improved more than ever (Figure 2-1-5).

Figure 2-1-5

Prioritization outline of S&T Measures in the FY 2008 Budget Requests



(3) Comprehension of S&T activities conducted by independent administrative institutions and national universities, and the publication of opinions offered regarding the activities (November 2007)

Independent administrative institutions and national university corporations engaged in S&T activities are funded by government subsidies. There is therefore a limitation in understanding the use, services implemented, and the allocated amount of grants at the budgetary process. From the perspective of ensuring appropriate implementation of the Plan, a survey had been conducted for various indicators that can be regarded as outputs from institutions and corporations. Based on the results of the survey, the CSTP executive members summarized their findings on items with progress found and items that are regarded to need further enhancement of efforts.

(4) Towards the S&T budgetary process (Decision/supplementary recommendation: November 28, 2007)

CSTP determined the items to be prioritized and noted in the budgetary process so as to sufficiently ensure the S&T budget based on the prioritization results, and its opinions were offered to the Prime Minister and the relevant ministers.

It should be noted that, in the FY 2008 budget (draft), promotion of S&T is positioned as the source of growth, and the total amount of S&T budget accounts for 3,570.8 billion yen (up 1.7% from the previous fiscal year) even under the circumstances where general expenditures are strictly restrained. Of this amount, the Special Coordination Funds for Promoting Science and Technology, one of the core budgets for promotion of S&T, accounts for 1,362.8 billion yen (up 1.1% from the previous fiscal year).

(5) R&D evaluations

1) Follow-up of prior evaluations of nationally important R&D projects (July 2007)

Concerning the development and shared use of MEXT's X-ray Free Electron Laser (XFEL) as well as the Ministry of Economy, Trade and Industry's (METI) Project for Strategic Promotion of Advanced Basic Technologies, prior evaluations implemented in FY 2005, the Expert Panel on Evaluation carried out a follow-up of the reactions to the evaluation results and presented points for improvement to each ministry.

2) Wrap-up of the state of implementation of interim and post-project evaluations by each ministry/agency (September 2007)

CSTP wrapped up the states of implementation of the interim evaluation of the ongoing R&D projects with the budget exceeding one billion yen for FY 2007 and of the post-project evaluation of those ended within FY 2006 with the budget exceeding one billion yen for FY 2005 or 2006. The relevant ministries were instructed to conduct interim and post-project evaluations appropriately in the future and to contribute to the promotion of measures based on the Third Basic Plan.

3) Evaluation of nationally important R&D projects (Decision/Notice: September 13, 2007)

An evaluation was conducted on the Development and Use of an Advanced, High-performance, General-purpose Supercomputer (prior evaluation conducted in FY 2005), and CSTP notified the Minister of MEXT in charge of this project of the results.

4) Prior Evaluation of nationally important R&D projects (Decision/Notice: November 28, 2007)

Prior evaluations of large R&D development projects to be newly implemented in FY 2008, including METI's Regional Innovation Joint Creation Program, the Ministry of Agriculture, Forestry and Fisheries' (MAFF) Basic Research Promotion Program for Creation of Innovation, and Practical Technology Development Program for Promotion of New Agricultural, Forestry and Fishery Policies were carried out as one of the nationally important R&D projects, and each minister were notified of the results.

3 Major Items Discussed at the Expert Panel

(1) Expert Panel on Basic Policy Promotion

The Panel, established in April 2006 to steadily promote the Third Science and Technology Basic Plan, conducted a survey on the reform of various S&T systems as well as on the competitive funds system. Under the Panel, three working groups (WGs) were established in FY 2007: S&T Diplomatic Promotion WG for mutual development of Japan's S&T and diplomacy; iPS Cell Research WG to examine ways to advance comprehensive induced pluripotent stem cells, as well as organization of research systems; and S&T Policies in Regions WG to establish overall strategies for strongly promoting creation of regional innovation. In addition, the Promotion Strategy Project Team (PT) was also established to implement the following actions:

1) Follow-up of promotion strategy

As for implementation of the Promotion Strategy (CSTP decision: March 2006), follow-up is implemented every year by the respective PTs established under the Promotion Strategy PT for each of the four priority fields to be promoted (life sciences, information and telecommunications, environmental sciences, and nanotechnology/materials) and the four fields to be promoted (energy, manufacturing technology, infrastructure, and frontier) as well as the PT on regional science clusters. The FY 2006 follow-up results were wrapped up in June 2007.

2) Promotion of the Coordination Program of S&T Projects

As a new mechanism for eliminating adverse effects caused by sectionalism and for enhancing cooperation among related ministries and agencies, CSTP promotes the Coordination Program of S&T Projects consisting of nationally and socially important topics in cooperation with related ministries and agencies. Starting in FY 2005, eight topics (1) Basic Research and Infrastructure for Life Sciences; (2) Emerging, Reemerging Infectious Diseases; (3) Ubiquitous Networks; (4) Next Generation Robots; (5) Biomass Utilization Technologies; (6) Hydrogen & Fuel Cell; (7) Nanobiotechnology; and (8) Regional Science & Technology Cluster) are being implemented. In FY 2007, six new topics (9) Clinical and Translational Research; (10) Food and Biological Production Research; (11) Very Large Information Integration and Application Platform; (12) Integrated Chemical Risk Management; (13) Developing Nanotechnologies and Engaging the Public; and (14) Research and Development for Counterterrorism are selected and implemented. Topics to be completed in FY 2007 are being wrapped up.

(2) Expert Panel on Evaluation

The follow-up of prior evaluations of nationally important R&D projects implemented in the past were carried out. The Panel also wrapped up evaluation drafts of the nationally important R&D projects starting in FY 2007.

(3) Expert Panel on Bioethics

The Panel aims to conduct surveys and discuss bioethics in order to cope with problems of bioethics derived in accordance with the development of bioscience. In FY 2007, the Panel obtained the latest findings by interviewing experts on research in ES cells (embryonic stem cells), in iP cells, and the status of such studies in other countries.

(4) Expert Panel on Management of Intellectual Properties

The Panel finalized the supplementary recommendation on the Intellectual Property Strategy, which mainly focused on the promotion of intellectual property activities at universities and refers to the creation of innovation by utilizing intellectual properties, improvement of intellectual property systems and practices at universities, and the protection and utilization of intellectual property in the life sciences. CSTP made this recommendation and offered it to the relevant ministers in May 2007. In addition, CSTP follows up on organizing systems of the cooperation and sharing among them when smoothly implementing measures, which are described in the Strategy and require such cooperation.

3 S&T Administrative Structure and Budget

1 S&T Administrative Structure

The Science and Technology Basic Law requires the government to assume the responsibility of formulating and implementing comprehensive measures in relation to the promotion of S&T and to formulate the Science and Technology Basic Plan. Under the administrative organization, CSTP is

established in the Cabinet Office, which is in charge of the planning of key policies of the government and overall coordination. CSTP summarizes various reports on the comprehensive strategy on the promotion of S&T and policies for the allocation of resources, such as budgets and human resources. Based on these reports and the authorities of each relevant administrative agency, they conduct research, promote research under the various systems, and develop the R&D environments at national experiment and research institutions, independent administrative institutions, universities, and inter-university research institutes.

MEXT prepares specific R&D plans for individual sectors and coordinates the management of S&T with the relevant administrative institutions through such work as the allocation of the Special Coordination Funds for Promoting Science and Technology. In addition, MEXT comprehensively promotes the implementation of R&D in advanced and important S&T fields and the administration of S&T that advances and strengthens creative and basic research. The Council for Science and Technology (CST) is established under MEXT to survey and discuss important matters in relation to the comprehensive or academic promotion of S&T based on a consultation from the Minister of MEXT, and to offer its own opinion to the Minister. CST’s main reports are shown in Table 2-1-6.

In recent years, inter-ministerial liaison committees concerning various research sectors and related measures are being held, promoting information exchanges concerning the progress of research, etc., and researcher exchanges.

In addition, the Science Council of Japan (SCJ), consisting of 210 members and some 2,000 associate members, is established under the jurisdiction of the Prime Minister as the representative body for the community of scientists in Japan. SCJ is engaged in such activities as suggesting policies in relation to science, discussing important issues, cooperating with the community of scientists, cooperation with international academic organizations, and raising public awareness about the roles of science.

Table 2-1-6

Reports of the Council for Science and Technology (FY2007)

Date (m/d/y)	Reports
7/23/07	<u>Subdivision on R&D Planning and Evaluation</u> Earth Observation in Japan in FY 2008
9/5/07	<u>Subdivision on Resources</u> Promotion of science and technology that utilize and create optical resources
8/10/07	<u>Subdivision on Science</u> Direction of measures to be taken on Grants-in-Aid for Scientific Research (Subcommittee on Research Expenses -Summary of Deliberations (Part 1)-
12/18/07	<u>Subdivision on Ocean Development</u> Follow-ups of Basic Concept and Promotional Measures for Ocean Development from the Long-range Outlook (Report)
8/31/07	<u>Technology and Research Foundations Section</u> Toward Strategic Development for Creation of Innovation under Industry-Academia-Government Cooperation (Summary of Deliberations)
9/4/07	Intellectual Fundamentals Establishment Plan
2/1/08	<u>The Bioethics and Biosafety Commission</u> Approaches to preparation/utilization of research objectives of cloned human embryos (The first-phase report)

2 S&T Budget

The FY 2007 S&T budget totals 3,511.3 billion yen. Of this total, the general account budget is 2,990.5 billion yen; the special account budget is 520.8 billion yen. In the general account budget, the amount singled out for the Special Coordination Funds for Promoting Science and Technology is 1,347.7 billion yen. (Table 2-1-7) Trends in S&T budget by ministry and agency are shown in Table 2-1-8.

Since Japan's S&T administration is spread among a large number of ministries and agencies, there is a need for the coordination of S&T measures between them that can eliminate unnecessary duplication of measures and promote stronger cooperation, so as to ensure consistency as a whole, as well as to efficiently and effectively promote S&T. For this reason, MEXT collects information from the relevant ministries and agencies in prior to S&T budget requests and coordinates with them so as to eliminate any duplication of requests and to promote inter-ministerial cooperation.

Table 2-1-7

Trends in S&T Expenditures

(100 million yen)

FY		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Item	Funds for promoting S&T (A)	12,298	12,841	13,170	13,312	13,477
	Percentage increase over the previous year %	103.9	104.4	102.6	101.1	101.2
Other research appropriations (B) :		6,554	16,823	16,345	16,667	16,428
	Percentage increase over the previous year %	97.9	256.7	97.2	102.0	98.6
S&T budget in general accounts (C)=(A)+(B)		18,852	29,664	29,515	29,979	29,905
Percentage increase over the previous		101.7	157.4	99.5	101.6	99.8
S&T budget in special accounts (D)		17,122	6,419	6,264	5,764	5,208
Percentage increase over the previous		101.2	37.5	97.6	92.0	90.4
S&T budget (E)=(C)+(D)		35,974	36,084	35,779	35,743	35,113
Percentage increase over the previous		101.5	100.3	99.2	100.1	98.2
General account budget (F)		817,891	821,109	821,829	796,860	829,088
Percentage increase over the previous		100.7	100.4	100.1	97.0	104.0
General budget expenditure (G)		475,922	476,320	472,829	463,660	469,784
Percentage increase over the previous		100.1	100.1	99.3	98.1	101.3

Table 2-1-8

S&T Expenditure Breakdown by Ministry/Agency

(Million yen)

Items Ministry or agency	FY 2006				FY 2007			
	Funds for promoting S&T	Other research appropriation s from	S&T budget in special accounts	Total amount of S&T Budget	Funds for promoting S&T	Other research appropriation s from	S&T budget in special accounts	Total amount of S&T Budget
Diet	1,013	47	—	1,059	1,067	47	—	1,114
CAS	—	61,195	—	61,195	—	60,312	—	60,312
CAO	11,876	3,916	—	15,793	12,603	3,619	—	16,222
NPA	2,143	44	—	2,186	2,117	48	—	2,165
MIAC	54,569	13,144	7,200	74,912	53,388	13,209	6,500	73,097
MOJ	2,081	—	—	2,081	—	2,011	—	2,011
MOFA	—	10,981	—	10,981	—	11,515	—	11,515
MOF	1,276	326	—	1,601	1,222	319	—	1,541
MEXT	841,383	1,312,497	149,818	2,303,698	855,012	1,308,782	148,330	2,312,124
MHLW	109,776	1,470	19,522	130,768	111,763	1,451	18,315	131,529
MAFF	117,355	2,833	800	120,988	118,704	9,123	1,200	129,027
METI	144,185	47,296	366,608	558,089	152,681	40,236	310,478	503,325
MLIT	23,648	25,718	29,096	78,462	25,464	30,773	29,429	78,538
ENV	21,892	3,686	3,366	28,943	21,344	3,390	6,712	31,447
MOD	—	183,576	—	183,576	—	157,290	—	157,290
Total	1,331,195	1,666,729	576,410	3,574,334	1,347,699	1,642,774	520,785	3,511,258

Notes:

1. All amounts represent initial expenditures or appropriations for the respective fiscal year.
2. The figures in the total column may differ from the sum of the amounts for each column due to round-off.
3. There are cases when some figures are doubled up, except for the figures in the total column.