

2 Creating Scientific Development and Persistent Innovation

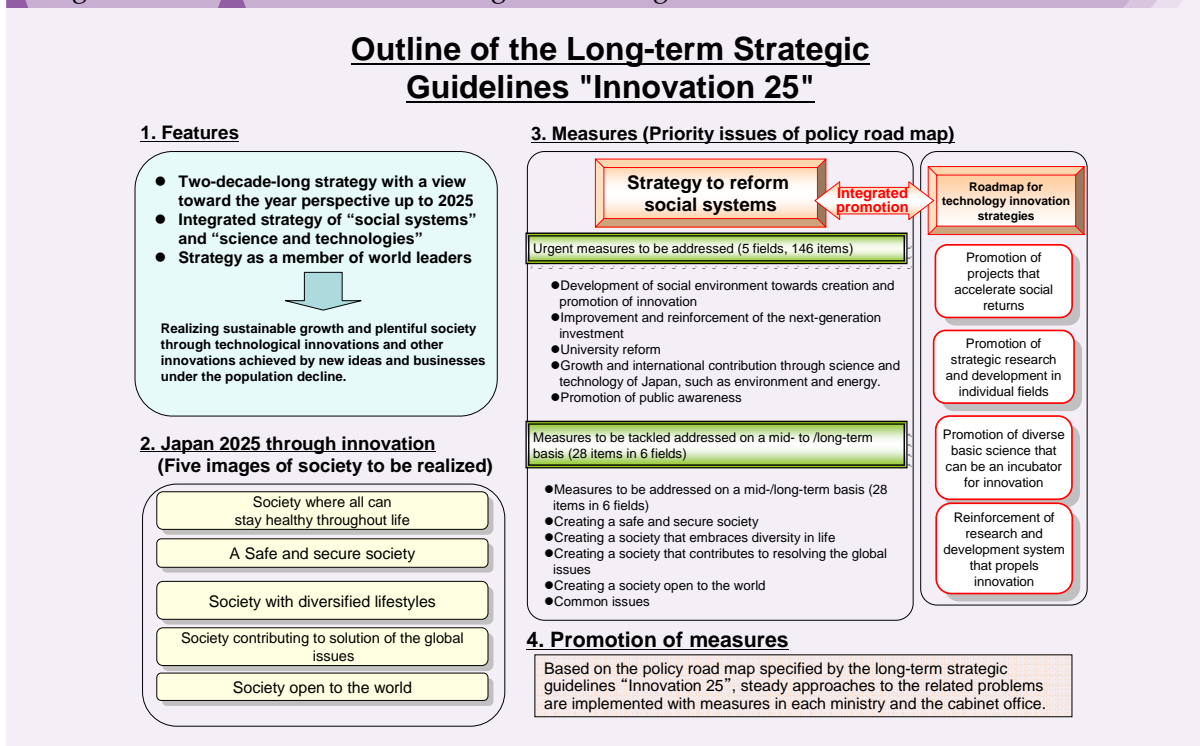
The term “innovation” is not a narrow-defined concept of simple “technological innovation,” but it implies extensively creating new values, including social systems, thereby causing substantial changes at all social levels. The “innovation nation,” which Japan aiming at is the society in which capacity of each individual person can be fully exerted, the society full of vitality, and the society in which we can actually feel richness.

The Cabinet Office determined that social system reform and technical renovation, which establish the social environment toward creation and promotion of innovation will be promoted in an integrated and continuous manner based on the Basic Plan and the long-term strategic guidelines Innovation 25. More specifically, steady approaches on measures for creation of innovation will be promoted through the (1) Pioneering Projects for Accelerating Social Return¹; (2) follow-up of progress status of the system reform; and (3) understanding of domestic and overseas movements related to innovation and other projects (Figure 2-3-7).

¹ Pioneering Projects for Accelerating Social Return: The projects aim to merge various technologies as follows with the goal of bringing them up to the demonstration research stage in the near future and accelerate social return of their achievements through demonstration research. They also aim for achievement of society that is stated in the long-term strategic guidelines Innovation 25 and promoting technology development concerning six projects as well as the system reform posing impediments. CSTP serves as a command center promoting the combined efforts of government agencies and the collaboration of the public and private sector.

- (1) Aiming for “a society where all can stay healthy throughout life”
 - Realization of medical care that replaces and restores a lost function
- (2) Aiming for “a safe and secure society”
 - Construction of the information and communication system which gives detailed disaster information to each resident, and helps disaster countermeasures
 - Realization of a safe and effective road and traffic system using information and telecommunications technology
- (3) Aiming for “a society with diversified lifestyles”
 - Realization of advanced home medical and nursing care
- (4) Aiming for “a society contributing to solution of the global issues”
 - Biomass utilization for the solution of energy and environmental issue
- (5) Aiming for “a society open to the world”
 - Realization of audio communication technologies that overcome language barriers

Figure 2-3-7 Outline of the Long-term Strategic Guidelines "Innovation 25"



MEXT promotes the World Premier International Research Center (WPI) Initiative to establish "globally visible research centers" that boast excellent research environment and extremely high research levels.

METI promotes the Innovation Superhighway Plan, which seeks to establish a mechanism for quickly leading R&D achievements to commercialization, as listed in the Economic Growth Strategy (formulated on June 19, 2007 by the Council on Integrated Financial and Economic Reform [literal translation]).

1 Developing a Competitive Environment

(1) Increasing competitive funds and indirect costs

The competitive funds, which contribute to creating a competitive R&D environment, were increased, with the amount of funds granted increasing to 481.3 billion yen under the FY 2008 budget (476.6 billion yen under the FY 2007 budget). Also expanded was the indirect costs grant scheme, in which a fixed percentage of the research grant is allocated to institutions that employ researchers who received the competitive funds in proportion to the research expenses and is thus effective in promoting competition among research organizations, with 40 of the 44 competitive funds available allocating 30% of the research funds and three other programs also allocating funds in some cases.

Table 2-3-8 shows competitive funds sponsored by government ministries and agencies.

Table 2-3-8 List of Competitive Funds

Ministry	Sponsor	Program	Program outline	FY 2007 budget (Unit: million yen)	FY 2008 budget (Unit: million yen)
CAO	CAO	Research on Technology for Evaluation of Effects of Food on Health	To promote research related to the development of evaluation standards in order to promote a science-based evaluation of the effects of food on health (risk evaluation).	364	364
Cabinet Office, Government of Japan Subtotal				364	364
MIC	MIC	Strategic Information and Communications R&D Promotion Programme	To actively promote unique and novel R&D projects in line with strategic priority targets in order to enhance R&D capabilities regarding information and communications technologies, raise the quality of researchers through the establishment of a competitive research environment and create intellectual property with global excellence.	2,950	2,573
MIC	National Institute of Information and Communications Technology	Advanced technology development for pioneering new communications and broadcasting areas (Telecom incubation)	To create new businesses in the communications and broadcasting sectors by supporting private-sector companies, including venture companies, that are engaged in R&D activities related to advanced technologies.	550	542
MIC	National Institute of Information and Communications Technology	Program for Supporting Private-Sector Infrastructure Technology Research	To invite proposals for experiment and research themes related to communications and broadcasting technologies from the private sector and entrust private-sector companies with experiments and research concerning selected themes in order to promote experiments and research that will contribute to strengthening the foundation of the national economy and people's lives.	6,500	4,200
MIC	Fire and Disaster Management Agency	Program for Promotion of Science and Technology Research for Fire Safety and Disaster Prevention	In order to promote science and technology related to prevention/mitigation of fires and other disasters with a view to realizing a safe and comfortable society, it is necessary to conduct research focusing on actual disaster prevention/mitigation activities while broadening the base of relevant technologies and promoting industry-academia-government coordination and research activities by local governments. Therefore, this competitive funding program seeks to promote R&D for the purpose of putting new technologies to practical use by allocating research funds to excellent research themes related to 1) the advancement of science and technology concerning firefighting, rescue and relief activities, 2) the promotion of computerization of information concerning anti-disaster measures and 3) the protection of the environment.	311	294
Ministry of Internal Affairs and Communications Subtotal				10,311	7,609
MEXT	MEXT/JSPS	Grants-in-Aid for Scientific Research	The Grants-in-Aid for Scientific Research aims to dramatically advance academic research (research based on the free-thinking of researchers) across all fields including the humanities and social sciences as well as the natural sciences, and from basic research through to applied research. The program supports creative and pioneering research that will be the development foundation of rich society as they passes the peer review (Note 1) process.	191,300	193,200

Ministry	Sponsor	Program	Program outline	FY 2007 budget (Unit: million yen)	FY 2008 budget (Unit: million yen)
MEXT	JST	JST Basic Research Programs (incl. social technology research and development projects)	To promote basic research related mainly to "strategically prioritized science and technology" items in line with "strategic sector" set by the government in light of social and economic needs, with a view to further advancing science and technology and developing technologies that will lead to the creation of new industries.	48,626	50,326
MEXT	MEXT	Special Coordination Funds for Promoting Science and Technology	A competitive fund of policy-guided type which is operated by MEXT in line with CSTP. Toward the full-scale execution of the Third Basic Science and Technology Plan, public participation related to science and technology system reformation will be invited for agile and strategic utilization.	36,800	33,800
MEXT	MEXT	21st Century COE Program	To make Japanese universities internationally competitive and raise their quality to the world's top level by providing targeted support for the establishment of global research and educational centers by national, public and private universities under the principle of competition based on third-party evaluation.	22,016	3,905
MEXT	MEXT	Global COE Program	To selectively support formation of excellent world-class education and research centers, while succeeding the basic concept of the "21st Century COE Program." In particular, it aims to enhance fostering functions of young researchers and formation of international centers.	15,758	33,986
MEXT	MEXT	World Premier International Research Center (WPI) Initiative	To establish "visible centers" which boast excellent research environments and a very high research level to attract front-line researchers from all over the world by offering intensive support to initiatives that aim for the formation of research centers with a core of high-level researchers and by prompting the introduction of system reformation.	3,500	7,109
MEXT	MEXT	Promotion of R&D for Key Technologies	To promote 1) R&D in life sciences based on social needs, 2) R&D related to the establishment of the next-generation IT infrastructure, 3) Promotion of Novel Interdisciplinary Fields Based on Nanotechnology and Materials in order to advance R&D concerning the key technologies that form the basis of activities for securing the safety and security of Japan and developing the country's economy.	15,967	19,315
MEXT	MEXT	Plan for Promotion of Global Observation Systems	To conduct technology development and observational research in fields where Japan should play the leading role, based on proposals selected from among those submitted in response to public invitations, with a view to the establishment of a global observation system advocated by the Earth Observation Summit.	573	373
MEXT	MEXT	Innovative Nuclear Research and Development Program	To implement, amid a competitive environment, R&D related to nuclear reactor and fuel cycle technologies targeted for promotion by the government and basic research related to such technologies, with a view to realizing a innovative nuclear system. Research proposals related to basic research are invited from young researchers.	5,205	5,926

Ministry	Sponsor	Program	Program outline	FY 2007 budget (Unit: million yen)	FY 2008 budget (Unit: million yen)
MEXT	JST	Development of Systems and Technology for Advanced Measurement and Analysis	To promote the development of pioneering measurement/analysis techniques and equipment that support unique and world-top-class research activities. In particular, this program aims to promote joint industry-academia development in the applications fields (manufacturing) in which users participate.	4,800	5,500
MEXT	JST	Research Program on Development of Innovative Technology	This program, which takes over from the Public Proposal System for Original and Innovative Technology Development Research program, terminated in FY 2006, with a view to ushering in new industries, invites from researchers working for private-sector institutions research theme proposals regarding innovative and unique technologies that will form the foundation of Japan's prosperity in the 21st century, and seeks to develop innovative practical technologies by taking advantage of excellent research themes selected from among those submitted.	1,740	822
MEXT	JST	Project to develop "Innovative Seeds"	To seek to contribute to the development of the society and economy as well as science and technology and to the improvement of people's living standards by facilitating feedback to the society of unique research results (seeds) obtained by universities, public research institutes, etc. by conducting R&D in a manner suited to the relevant technology phase amid a competitive environment so as to promote the commercialization of the results (foundation of university-based venture companies and technology transfers).	9,043	8,122
MEXT	JST	Collaborative Development of Innovative Seeds	To provide opportunities to identify potential technology seeds that may be hidden in the realm of basic research from the viewpoint of the industrial sector and conduct industry-academia joint feasibility studies (Note 2) with a view to bringing such seeds into the open. The seeds thus revealed are to be developed further through industry-academia joint research (with the use of the matching-fund format) in order to help to create innovations.	1,800	2,200
MEXT	JST	Science and Technology Incubation in Advanced Regions	To undertake activities, such as, coordinating work necessary for the creation of regional new industries and promote joint research for the purpose of industrialization so as to take advantage of research results achieved by universities, with JST Innovation Plazas and JST Innovation Satellites used as footholds for such activities.	8,273	9,400
MEXT	JST	Regionally Concentrated R&D Program, etc.	To promote industry-academia-government joint research with focus on specific research themes in fields where there are particularly strong regional needs for the foundation of start-up companies. To be conducted under this program are R&D activities for the purpose of fostering new technologies and new businesses, including the development of prototypes based on technology seeds created through basic research conducted by universities, etc.	3,479	2,925

Ministry	Sponsor	Program	Program outline	FY 2007 budget (Unit: million yen)	FY 2008 budget (Unit: million yen)
MEXT	MEXT	Program for Promotion of Humanities and Social Sciences to Satisfy Policy and Social Demands - Program for Promotion of Empirical Social Science Research toward Solution of Problems in Near Future - [literal translation]	To implement problem-solution-oriented research by collecting researchers from various fields, mainly from the social sciences, and by applying empirical research methods to problems that Japan will face in the near future. The results will be offered as proposals, etc. to society.	-	149
MEXT	MEXT	Program for the Promotion of Improvement of Joint Research Centers in the Humanities and Social Sciences [literal translation]	To promote the improvement and extension of nationwide joint use and joint research centers to private universities and other organizations through support for universities and other organizations by public invitation or entrusting for a fixed period (about 5 years), in order to promote joint research by maximally utilizing the potential of existing organizations that possess the academic materials, data, etc. relating to the humanities and social sciences, established in the 21st Century COE Program, etc.	-	351
MEXT	MEXT	Program for the Development of Basic Tools toward the Promotion of Marine Resource Utilization	To promote technology development for tools, such as sensors, to be utilized to acquire high-precision data on the amount of marine resources such as submarine hydrothermal deposits and cobalt rich crust.	-	400
MEXT	MEXT	Initiative for Nuclear Power Basic and Infrastructure Strategic Research [literal translation]	To promote research in a competitive environment by clarifying policy needs and by setting more strategic programs and themes in basic and infrastructure research for nuclear power in which technology infrastructure regarding nuclear power utilization is maintained at a high level, new knowledge and technology are created, human resources are fostered, and other measures are implemented. More specifically, the basic and infrastructure research for nuclear power is focused on three programs: 1) Strategic Nuclear Power Joint Research Program, 2) Research Program for Utilizing Research Reactors, Hot Laboratories, etc., and 3) Young-Researchers' Nuclear Power Research Program.	-	510
MEXT	JST	Science and Technology Research Partnership for Sustainable Development	To promote science and technology research partnerships with developing Asian and Africa countries by utilizing Japan's excellent science and technology and in cooperation with ODA, in environment, energy, and other research fields.	-	500
Ministry of Education, Culture, Sports, Science and Technology Subtotal				368,881	378,819
MHLW	MHLW	Health and Labour Sciences Research Grants	To provide subsidies to researchers engaged in the fields of health and welfare at universities and national and private research institutions. Under this program, research subjects are classified into 18 categories in four fields. In order to support research themes adopted, comprehensive research is to be promoted through the implementation of projects for nurturing and utilizing young researchers at public interest corporations.	40,871	40,692

Ministry	Sponsor	Program	Program outline	FY 2007 budget (Unit: million yen)	FY 2008 budget (Unit: million yen)
MHLW	Pharmaceuticals and Medical Devices Agency	Program for Promotion of Basic Research in the Health Care Sector	To provide operating funds to the National Institute of Biomedical Innovation in order to promote basic research related to the development, based on technology seeds created by universities, of pharmaceutical products that will contribute to the maintenance and advancement of good health of Japanese people in light of the fact that the importance of basic research is growing due to the recent advance of science and technology in the medical and health fields.	7,498	7,498
Ministry of Health, Labour, and Welfare Subtotal				48,370	48,191
MAFF	Bio-oriented Technology Research Advancement Institution	Program for promotion of basic research for creation of new technologies and new sectors	To promote unique basic research through invitation of research proposals from incorporated administrative agencies, universities, private-sector companies, etc. in order to create, from a fresh viewpoint, new technologies and new industrial sectors that make full use of biological functions, thereby helping to improve Japan's food self-sufficiency rate and resolve the problem of global food shortage.	4,677	-
MAFF	Bio-oriented Technology Research Advancement Institution	Research and Development Program for Bio-Industry Initiatives	To develop innovative technologies through industry-academia-government joint research projects that involve researchers in different fields in order to promote the creation of new industries and the foundation of start-up companies based on biotechnology and other bio-related advanced technologies. This program also provides support for R&D activities by researchers at incorporated administrative agencies, private-sector companies, etc. that aim to found bio-venture companies based on unique ideas and research results.	2,285	-
MAFF	MAFF	Research project for utilizing advanced technologies in agriculture, forestry and fisheries	To promote R&D closely related to production, distribution and processing in the agriculture, forestry and fisheries sectors through invitation of R&D proposals.	5,220	-
MAFF	MAFF	Program for new technology development to activate agriculture, forestry, fisheries and food industry by industry-academia-government collaboration	To promote R&D projects jointly conducted by private-sector companies and public research organizations, including universities and incorporated administrative agencies, in order to create new industries and businesses in the agriculture, forestry, fisheries and food sectors and resolve immediate policy challenges.	661	380
MAFF	MAFF	Practical Technology Development Program for Promotion of New Agricultural, Forestry and Fishery Policies	To promote technology development for practical application by using the proposal and public participation method in order to promote agricultural, forestry, and fishery policies and solve field problems, for the agriculture, forestry and fisheries industry, food industry development and regional revitalization. (Note 4)	-	5,200
MAFF	National Agriculture and Food Research Organization	Basic Research Promotion Program for Creation of Innovation	To supply funds (by the proposal and public participation method) to the development of technology seeds leading to the creation of new technology and new business in the agriculture, forestry and fisheries industry and the food industry, to R&D for extending the developed technology to an application stage, to R&D for establishing venture enterprises, and to other R&D. (Note 5)	-	6,805
Ministry of Agriculture, Forestry, and Fisheries Subtotal				12,843	12,385

Ministry	Sponsor	Program	Program outline	FY 2007 budget (Unit: million yen)	FY 2008 budget (Unit: million yen)
METI	NEDO	New Energy and Industrial Technology Development Organization	To invite research theme proposals from young researchers at universities, incorporated administrative agencies, etc., select unique and innovative proposals based on rigorous third-party evaluation and provide funds to the individual researchers concerned in order to discover technology seeds and develop human resources that meet the needs of the industrial sector as well as the society from the viewpoint of enhancing Japan's prowess in industrial technology.	5,892	4,779
METI	NEDO	Grant for Application of Industrial Technology Innovation (* FY 2007: R&D for practical use of university-based technology by matching government funds and private funds)	To provide matching funds, through TLOs (technology licensing organizations) in charge of R&D management, to cover part of the cost of industry-academia joint R&D projects aiming for commercialization of research results achieved by universities on condition that the companies involved provide part of research funds and that there are clear business plans.	8,675	1,750
METI	NEDO	Strategic Development of Technology for Efficient Energy Utilization	To publicly invite energy-conservation technology in a wide range from leading research to practical application development and empirical research, and to implement entrusting and subsidizing for the technology.	-	6,900
METI	NEDO	Eco-Innovation Promotion and Innovative Technology Development Program [literal translation]	To implement research and surveys (feasibility studies) regarding T&D contributing to the creation of environment- and human-emphasized technology reformation and social innovation (eco-innovation), and regarding the technology seeds leading to innovative countermeasures against global warming.	-	420
METI	METI	Consortium R&D Project for Regional Revitalization	To establish regional systems for industry-academia-government joint research (Regional Rebirth Consortium) by taking advantage of technologies developed by universities, and conduct advanced R&D activities with commercialization in mind.	9,918	-
METI	METI	Innovative and Viable Nuclear Energy Technology (IVNET) Development Project	To identify research themes that will lead to the practical use of unique and innovative technologies by publicly inviting proposals, and conduct technology development for the purpose of improving the safety and economy of nuclear power generation and the nuclear fuel cycle.	902	800
METI	METI	Research and Development Program of Regional Resource Utilization Type [literal translation]	To implement R&D for practical application in cooperation with enterprises, universities, and other organizations toward new product development, etc. by utilizing regional resources (regional products and technology) for creating new business in regions.	-	1,706
METI	METI	Research and Development Program for Regional Innovation Creation [literal translation]	To implement R&D for practical technology by establishing research entities organized through the optimal combination of regional resources for the purpose of regional economy revitalization by new business and new industry creation beginning from R&D.	-	7,400
METI	Japan Oil, Gas and Metals National Corporation	Research for Promoting Development/Utilization of Oil/Natural Gas	To conduct research, spanning from basic research to applications research, based on proposals selected from among those submitted in response to public invitations of proposals for unique and innovative technologies concerning oil and natural gas exploration and development.	1,204	471
Ministry of Economy, Trade, and Industry Subtotal				26,592	24,226

Ministry	Sponsor	Program	Program outline	FY 2007 budget (Unit: million yen)	FY 2008 budget (Unit: million yen)
MLIT	MLIT	Construction Technology Research and Development Subsidy Program	To publicly recruit proposals widely from researchers concerning research and development of technologies that contribute to sophistication and enhancement of international competitiveness of construction technologies controlled by MLIT, further promotion of R&D project implemented by MLIT, etc., in order to promote technological innovation in the construction sector.	400	500
MLIT	Japan Railway Construction, Transport and Technology Agency	Program for Promoting Fundamental Transport Technology Research	To seek to establish entirely new technologies that will contribute to the safety of traffic, the preservation of the environment and the development of advanced traffic services by publicly inviting unique and innovative research theme proposals.	404	348
Ministry of Land, Infrastructure, Transport and Tourism Subtotal				804	848
MOE	MOE	Global Environmental Research Fund	To seek to contribute to the preservation of the global environment in light of the serious impact of global environmental problems on the existence of humanity, by bringing together the talents of researchers in various fields so as to promote comprehensive investigations and research from interdisciplinary and global viewpoints.	2,960	3,197
MOE	MOE	Environmental Technology Development Fund	To promote environmental researches and technology development by recruiting proposals concerning R&D that broadly utilize wisdom of industry, academia and the government and by supporting research and development of excellent proposals, since research and technology development in the environment sector is one of important factors toward building of the sustainable 21st century society and positive growth cycle of the environment and economy.	881	836
MOE	MOE	Ministry of the Environment Waste Management Research Grants	To seek to resolve various problems related to waste by promoting research and technology development regarding the reduction of waste through curbs on waste discharges and recycling and regarding appropriate ways of disposing of waste that will contribute to the establishment of a recycling-oriented society.	1,261	1,135
MOE	MOE	Project for Development of Technology for Global Warming Countermeasures	To develop and put to practical use effective basic technologies for reducing emissions of energy-derived CO ₂ , such as those related to energy conservation and alternative energy sources, based on proposals invited from entities equipped with the ability to implement technology development and with the necessary facilities and equipment.	3,302	3,710
Ministry of the Environment Subtotal				8,404	8,878
Total				476,570	481,321

The figures in the "total" column may differ from the sum of the amounts for each column due to round-off.

(Note 1) Peer review: Review by researchers in some fields similar to the specialized fields.

(Note 2) FS (feasibility study): An experiment or an investigation conducted to examine whether a planned project can be carried out successfully.

(Note 3) Matching fund: A scheme in which subsidies are provided to cover the project costs to be borne by universities and other parties involved, in amount not exceeding the amount of funds provided by the companies involved.

(Note 4) The Research Project for the Utilization of Advanced Technologies in Agriculture, Forestry and Fisheries up to FY 2007 was reorganized and implemented from FY 2008.

(Note 5) The Program for the Promotion of Basic Research for the Creation of New Technologies and New Sectors and the Research and Development Program for Bio-Industry Initiatives were reorganized and unified, and implemented from FY 2008.

(2) Cultivation of competitive environments within organizations

(Effective mix of basic and competitive funds at universities)

At Japanese universities, basic funds play an important role in supporting the foundation of the basic organization (personnel, education and research environment, etc), while competitive funds support a diverse range of excellent research and education programs.

Taking account of the fact that basic and competitive research funds thus have their respective functions, with each of them playing an important role, MEXT aims to expand the competitive fund scheme while endeavoring to secure sufficient basic funds such as government subsidies for national university corporations and subsidies for private universities as it considers how best to mix the two types of funds.

(3) Implementation of institutional reform related to competitive funds

CSTP implemented measures for further promoting the system reform including use, allocation, and evaluation of research funds, such as competitive funds according to the Promotion Strategy PT compiled by the Expert Panel on Basic Policy Promotion in June 2007. More specifically, such measures include the following: (1) assurance of diversity and continuity of basic research that would be the seeds of innovation, and establishment of seamless mechanism to lead them to the exits (enhancement of competitive funds, setting of the Big Challenge Research Scheme, and development of a system of linkage among all national competitive fund systems); (2) establishment of research environment that is attractive to young and female researchers; (3) enhancement of high-risk, impactful, or unique research, and enhancement of a mechanism that broadens research; (4) enhancement of evaluation system (decision of National Guideline on the Method of Evaluation for Government R&D); (5) establishment of fair, transparent and efficient allocation and usage system which maximizes effects of research funds (unification of rules regarding competitive funds and shared use of e-Rad). In addition, CSTP conducts follow-ups of execution status of system improvement.

The related government ministries, funding agencies, universities, etc. hold study meetings for effective utilization of research funds [literal translation] in order to unify rules across government ministries and to address system improvement problems by continuously exchanging opinions for easier use of research funds.

(Establishment of a fair and transparent screening system)

When allocating competitive funds, it is important to screen proposed research plans in a fair and transparent manner and by attaching importance to both the contents of the plans and the implementation capacity of the applicants. Therefore, regarding each competitive fund program, efforts are underway to implement reform measures such as increasing the number of screeners, requiring the submission of more detailed plans, revisions of screening criteria and the employment of screeners from a diverse range of fields, while endeavoring to streamline the screening activities. With regard to MHLW's Health and Labour Sciences Research Grants program, national research organizations to which operations related to this program are transferred are notified of points of attention for clarifying the criteria for the selection of members of the screening committee as a way to establish a fair and transparent screening system.

(Feedback of screening results)

Regarding each competitive fund program, efforts are underway to promote disclosure of details of screening results so as to ensure appropriate feedback to researchers. In FY 2008, feedback of screening results including the provision of comments by screeners to unsuccessful

applicants was implemented for 38 of the 44 programs available.

(Enhancement of the functions of funding agencies)

Funding agencies in charge of allocating competitive funds strengthen their systems by appointing program officers and program directors and enhancing research and analysis functions as well as administrative functions related to screening, fund distribution and management. JSPS, the funding agency under the jurisdiction of MEXT, established the Research Center for Science Systems, which conducts surveys and research concerning how to promote science in order to support JSPS's activities. JST established the Center for Research and Development Strategy (CRDS), which is in charge of planning related to research fields that should be promoted as priorities.

2 Enhancing the Competitiveness of Universities

(1) Creation of universities with world-class excellence in S&T and basic research

In order to make Japanese universities competitive internationally, cultivation of a competitive environment at universities, whether national, public, or private universities, is required. Based on the results of the Graduate School Education in the New Age (September 2005), a CSTP recommendation, the Science and Technology Basic Plan and the results of the 21st Century COE Program, launched in FY 2002, and in order to further enhance and strengthen research and education functions at graduate schools in Japan, MEXT implemented since FY 2007 the Global COE Program, which further emphasizes enhancement of functions to develop young researchers and internationality of the centers to selectively support formation of international, outstanding education and research centers. By FY 2008, MEXT adopted 131 centers from 40 universities.

To further develop all basic research in Japan, a system must be built where researchers can perform research cooperatively by utilizing the full potential of universities, regardless of whether the universities are national, public, or private. Based on the Wrap-up Report of Deliberations on the Promotion System of Scientific Research [literal translation], which was compiled in May 27, 2008, by the Research Environment Infrastructure Section, Subdivision on Science, CST, a system across national, public, and private universities was established, in which shared use and joint research centers are to be certified by the Minister of MEXT.

(2) Revitalizing universities by taking advantage of their individuality and distinctiveness

(Making universities more open to local communities)

Regional universities must make greater contributions to the development of their host regions as they are important sources of intellectual and human resources for the regions.

In February 2006, the Headquarters for the Regional Revitalization Headquarters decided on the Program for the Revitalization of Regional Knowledge Centers [literal translation], and subsequently in March 2008, the headquarters enhanced the program by making revisions including introduction of new measures such as the practical technology development project for promoting new agricultural, forestry, and fisheries policies and the regional innovation creation R&D project. In response, the Cabinet Office approved 80 regional revitalization plans that utilize the program by December 2008. Various projects in which universities and local communities collaborate with each other are in progress.

MEXT launched the SCF-funded program for the Center Development Creating Personnel for the Regional Revitalization [literal translation] from FY 2006 to establish regional knowledge

centers through which local universities and the host regions collaborated to develop competent persons by taking advantages of S&T. The ministry adopted and supports 35 projects by March 2009.

In December 2008, the meeting of the Unified Headquarters for the Regional Revitalization approved the partial revision of the Regional Revitalization Strategy that was released in November 2007 as a comprehensive strategy for regional revitalization. This specifies the necessity of promoting regional industry-academia-government cooperation through collaboration between regional organizations and universities to enhance human resources for region activation.

3 Enhancing Systems for Creating Innovation

(1) Establishing top world-level research centers

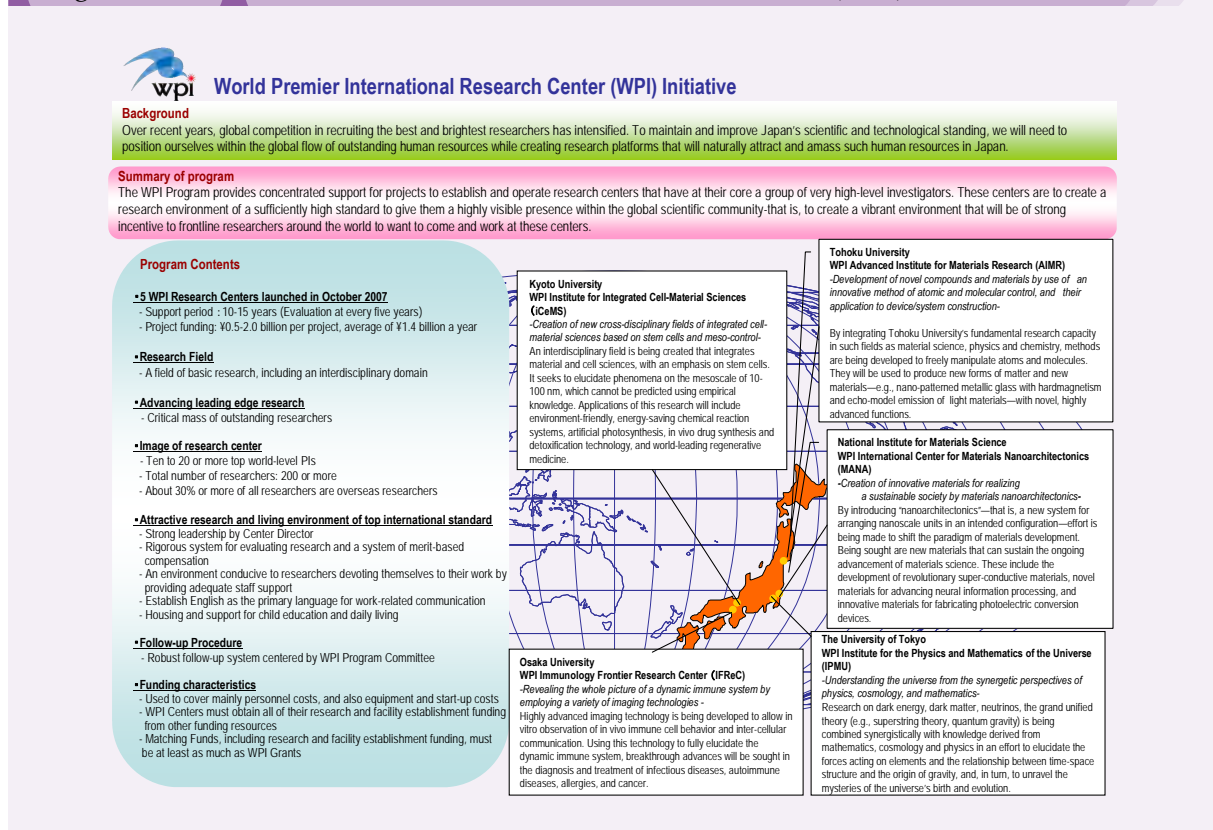
Over recent years, global competition in recruiting the best and brightest researchers has intensified. To maintain and improve Japan's scientific and technological standing, we will need to position ourselves within the global flow of outstanding human resources while creating research platforms that will naturally attract and amass such human resources in Japan.

With awareness of this issue, MEXT has promoted its World Premier International Research Center (WPI) Initiative which aims for the establishment of "globally visible research centers," each of which providing an excellent research environment and the high level of research capable of attracting the best frontline researchers from around the world. This program was implemented in FY 2007. Each research center receives 0.5 to 2 billion yen (an average of 1.4 billion yen) per year, and this support is scheduled to continue for 10 to 15 years. At present, the following five centers adopted in October 2007 are active (Figure 2-3-9):

- WPI Research Center: Advanced Institute for Materials Research (WPI-AIMR), Tohoku University
- Institute for the Physics and Mathematics of the Universe (IPMU), the University of Tokyo
- Institute for Integrated Cell-Material Sciences (iCeMS), Kyoto University
- Immunology Frontier Research Center (IFReC), Osaka University
- International Center for Materials and Nanoarchitectonics (MANA), National Institute for Material Science

In addition, a powerful follow-up system led by the WPI Program Committee was established to monitor the progress to be made in center projects, thus aiming to ensure that each becomes a "globally visible research center."

Figure 2-3-9 World Premier International Research Center (WPI) Initiative Schema



(2) Enhancing various research funding programs suited to the various stages of R&D (Enhancing competitive research for the creation of innovation)

It is important to lead scientific discoveries and technological inventions realized by basic research beyond the confines of scientific papers so as to produce social and economic values and feed back the benefits to society and people. Therefore, it is necessary to manage purpose-specific basic research and applied research programs appropriately in order to prevent them from becoming mere tools for satisfying researchers' own intellectual curiosity. In this context, JST promotes basic research related to strategically prioritized S&T items as part of its Basic Research Programs under a program officer invested with the responsibility and discretion concerning the management of research progress in order to achieve the strategic sector set by the government for the purpose of creating innovation. In addition, JST implements the Collaborative Development of Innovative Seeds and the Project to Develop "Innovative Seeds" as applied research programs intended to feed back the research achievements to society.

In the Basic Research Promotion Program for Creation of Innovation which is implemented by NARO, the screening and evaluation committee screen proposed research plans and evaluate implemented plans based on its members' understanding of these projects' objective of contributing to the agriculture, forestry, fisheries and food industries, etc. Interim evaluation is conducted on ongoing research projects with regard to the research results so far obtained and how they should be implemented in the future. The results of the evaluation will be conveyed by program officers to the researchers concerned so as to ensure that research plans are implemented in accordance with the objective of these projects.

(Establishment of advanced research centers in the interdisciplinary fields)

Based on the view that Japan should develop pioneering research fields in order to create

innovation, the Third Science and Technology Basic Plan points out that it will be effective to make intensive investments, with the support of the industrial sector, for the establishment of research and education centers with emphasis on advanced research fields.

In FY 2006, MEXT launched the SCF-funded program Creation of Innovation Centers for Advanced Interdisciplinary Research Areas, which supports organizations endeavoring to establish centers that would conduct R&D, starting from the basic research stage, in advanced interdisciplinary fields through industry-academia collaboration with a view to achieving commercialization in the future. Currently, 21 research organizations are engaged in such efforts. As FY 2008 is the third fiscal year for the projects adopted in FY 2006, they were reviewed for further fundings in the next fiscal years. As a result, MEXT determined that four projects would be further funded, four other would not be funded but permitted again to apply for being reviewed in FY 2009 for continued fundings, and one project to be discontinued.

(Reform of research funding systems across ministerial boundaries)

CSTP reforms the public research funding systems by building the National R&D Database utilized for macro analysis, which is necessary for formulating Science and Technology Basic Plan and research and deliberations concerning the allocation of resources.

The research funding systems sponsored by government ministries and agencies and R&D programs conducted by research organizations in the industrial, academic and government sectors cover various stages of development, from basic research to commercialization, and it is necessary to establish a mechanism that advances development persistently across various programs and organizations right up to commercialization. In FY 2008, for the Okinawa Innovation Creation Project [literal translation] of the Cabinet Office, information sharing was conducted with related organizations and, actually, collaboration cases with projects of other ministries were created across ministries and agencies. Under the Health and Labour Sciences Research Grants, there are projects which share the evaluation committee with projects sponsored by other ministries and agencies and which use the matching fund format. Practical use of research achievements is thus promoted through collaboration with projects sponsored by other ministries and agencies and through burden-sharing concerning development. Meanwhile, MAFF implements research programs intended to apply technology seeds produced by basic research conducted by other ministries and agencies and research achievements in other sectors to the agriculture, forestry and fisheries sector.

(3) Establishment of a sustainable and advanced industry-academia-government collaboration system

As the 21st century is referred to as the "century of knowledge," the creation and utilization of that knowledge is indispensable to the future development of Japan, so industrial-academia-government collaboration is an important means for producing a constant stream of innovation. Although industry-academia-government collaboration in Japan has recently made significant progress, the level of collaboration is not yet necessarily sufficient compared with the top world-level research potential of Japanese universities. Therefore, it is necessary to promote industry-academia-government collaboration further, and our country increases its efforts in this regard.

In June 2008, the Seventh Conference for the Promotion of Collaboration among Business, Academia, and Government was held with the participation of leaders and working-level officials from companies, universities, and administrative organizations across Japan, under the sponsorship of the Cabinet Office, MIC, MEXT, METI, Japan Business Federation (Nippon Keidanren), and SCJ, in order to further promote industry-academia-government collaboration. In addition to

presentations delivered by representatives from the industrial, academic and government sectors, discussions by the working-level officials were conducted in panel discussions on specific themes. Furthermore, in the Conference, 16 awards including one Prime Minister's Award were given to parties that were involved in successful cases of industry-academia-government collaboration (Table 2-3-10).

Table 2-3-10 Winners of Seventh Industry-Academia-Government Collaboration Promotion Award

Award	Title of awarded research [literal translation]	Award winner	
Prime Minister's Award	Development of High-Performance Tunnel Magneto-resistive Elements for Ultrahigh-Density HDD	Shinji Yuasa Yoshishige Suzuki David Djayaprawira	Research group leader, Nanoelectronics Research Institute, National Institute of Advanced Industrial Science and Technology Professor, Osaka University Manager of Electron Device Headquarters, Canon ANELVA Corporation
Minister of State for Science, Technology and Innovation Policy Award	Industrialization of Completely Cultured Bluefin Tuna	Hidemi Kumai Tsukasa Ohara	Administration officer and professor at Kinki University President of A-marine Kindai Co.,Ltd
Minister of State for Science, Technology and Innovation Policy Award	Development of Biometric Recognition Devices Using Frequency Analysis Method	Taizo Umezaki Chuo Spring Co.,Ltd. DDS, Inc.	Professor at Nagoya Institute of Technology
Minister of Internal Affairs and Communications Award	Core Technology of Communication System of Wideband Internetworking Engineering Test and Demonstration Satellite (WINDS)	Mitsuo Tateiba Space System Division, Aerospace and Defense Headquarters, NEC Corporation [literal translation] Kamakura Seisakusho, Mitsubishi Electric Corporation	Principal at Ariake National College of Technology Professor emeritus at Kyushu University
Minister of MEXT Award	Development of High-Resolution, Three-Dimensional Electron Microscope	Hiroshi Jinnai JEOL Ltd.	Associate professor at Kyoto Institute of Technology
Minister of MEXT Award	Development of "Hart Step," Active Walker for Self-Supported Walking	Hiroshi Kobayashi Kazutaka Irie Yutaka Sato	Professor at Tokyo University of Science Representative executive of Hart Walker Japan Chief of Applied Device Development Section, Development Engineering Department, Kanda Tsushin Kogyo Co.,Ltd. [literal translation] Former leader of Muscle Care Project, Hitachi Medical Corporation [literal translation]
Minister of MEXT Award	Promotion of the Hakodate Marine Biocluster	Yoshiaki Maita Kohei Yamauchi Katsumi Miyajima	Vice-president of Hakodate Regional Industry Promotion Organization Designated Professor, Institution for Collaborative Relations, Ehime University / Director, Nanyo Fishery Research Center (Former Deputy Director, Vice-president, Creative Research Institution Sousei, Hokkaido University) Industry-academia-government collaboration coordinator, Collaborative Research Center at Future University-Hakodate (Former Director, Research and Development Department, Hokkaido Industrial Technology Center) [literal translation]
Minister of Health, Labour and Welfare Award	Development of an Activity Measurement Method for Thrombotic-Disease-Related Enzyme ADAMTS13	Toshiyuki Miyata Koichi Kokame Masahiko Tsunemi	Director, Department of Etiology and Pathogenesis, National Cardiovascular Center Research Institute Laboratory Chief, Department of Vascular Physiology, National Cardiovascular Center Research Institute Director, Planning and Development Department, Peptide Institute, Inc. [literal translation]
Minister of Agriculture, Forestry and Fisheries Award	Development of Fermentation Liquid Feeding by Utilizing Food Residue	Tomoyuki Kawashima Mao Saeki Koichi Takahashi	Team Leader, National Institute of Livestock and Grassland Science, National Agriculture and Food Research Organization Full-time instructor at Nihon University Adviser to the Odakyu Food Ecology Center, Odakyu Building Service Co.,Ltd.
Minister of Economy, Trade and Industry Award	Regional Integrated Cooperation Support Program Based on Okayama Research Park Incubation Center (ORIC)	Akira Matsuo Naoyuki Yokota Shinichiro Kubota	Director and Incubation Manager of Okayama Research Park Incubation Center (ORIC) Director of Small and Medium Sized Enterprise Support Center, Management Support Department, Okayama Prefecture Industrial Promotion Foundation [literal translation] Researcher, Department of Mechanical Engineering, Industrial Technology Center of Okayama Prefecture
Minister of Land, Infrastructure and Transport Award	Development of High-Precision Cancer Radiation Therapy Equipment	Noriyuki Kawada Masahiro Hiraoka Masaki Kokubo	Chief Engineer of Medical Equipment Business Control Department, Mitsubishi Heavy Industries, Ltd. [literal translation] Professor at Kyoto University Leader, Radiotherapy Research Group, Institute of Biomedical Research and Innovation laboratory, Foundation for Biomedical Research and Innovation

Award	Title of awarded research [literal translation]	Award winner	
Minister of Economy, Trade and Industry Award	Regional Revitalization by Utilizing Miyazaki Public Trial SPG Technology	Kiyoshi Torigoe Tadao Nakashima Nobori Nakashima	Director, Material Development Department, Miyazaki Prefecture Industrial Technology Center [literal translation] Representative executive of Control Lipotex Co., Ltd. [literal translation] (Former director of the Miyazaki Prefecture Industrial Technology Center) [literal translation] President of SPG Technology Co., Ltd.
Minister of Land, Infrastructure, Transport and Tourism Award	Technology for the Recycle of the Mud with High Water Content by Using Fiber-Solidified Soil "Bon Terrain"	Hiroshi Takahashi Masato Mori Keiji Masuko	Professor at Tohoku University Director of Mori Environment Technology Laboratory Co., Ltd. [literal translation] Chairman of the Bon Terrain Committee [literal translation]
Minister of the Environment Award	Development of Semiaerobic Landfill Structure (Fukuoka Method) and Closed System Landfill Site	Masataka Hanashima	Fukuoka Research Center for Recycling Systems, the Fukuoka Prefecture Environmental Conservation Public Corporation [literal translation] Director Professor emeritus at Fukuoka University
Chairman of NipponKeidanren Award	Development of High-Speed Film-Forming Technology for High-Quality Microcrystalline Silicon by High-Pressure Depletion Method	Michio Kondo Yasuhiro Yamauchi Yoshiaki Takeuchi	Director of Research Center for Photovoltaics, the National Institute of Advanced Industrial Science and Technology [literal translation] Chief Engineer of the Photovoltaic Cell Business Unit, Nagasaki Shipyard & Machinery Works, Mitsubishi Heavy Industries, Ltd. [literal translation] Chief Researcher of the Plasma Optical Technology Laboratory, Nagasaki Research & Development Center, Technical Headquarters, Mitsubishi Heavy Industries, Ltd. [literal translation]
President of Science Council of Japan Award	Development of Real-Time, Three-Dimensional Microscope Imaging System, and Research of Real-Time Visualization of Molecule Moving Status in Cells	Akihiko Nakano Kenta Mikuriya Kenkichi Tanioka	Chief Researcher of RIKEN Professor at the University of Tokyo Director of the Cost Planning Center, Technology Planning Headquarters, Yokogawa Electric Corporation [literal translation] Director-General of the NHK Science & Technology Research Laboratories

In November 2008, the 8th Business-Academia-Government Collaboration Summit was held under the sponsorship of the Cabinet Office, MIC, MEXT, METI, Japan Business Federation, and SCJ. Under the theme "Business-Academia-Government Collaboration and Growth Strategy [literal translation]," leading persons from the private sector, universities, and government agencies gathered to discuss the role of these three sectors and the development of cooperation through presentations and panel discussions on sustainable innovation creation by S&T.

METI, with the support of NEDO, formulated the Strategic Technology Roadmap in 2005, which provides a vision of future needs of society and people as well as future technological progress and trends. METI revises the Roadmap every year, and it officially announced it under the title Strategic Technology Roadmap 2008 in April 2008. The ministry utilizes the Roadmap not only as a tool for R&D management but uses it as a means to facilitate communications between individuals involved in planning and implementation of R&D by distributing it widely in the industrial, academic and government sectors.

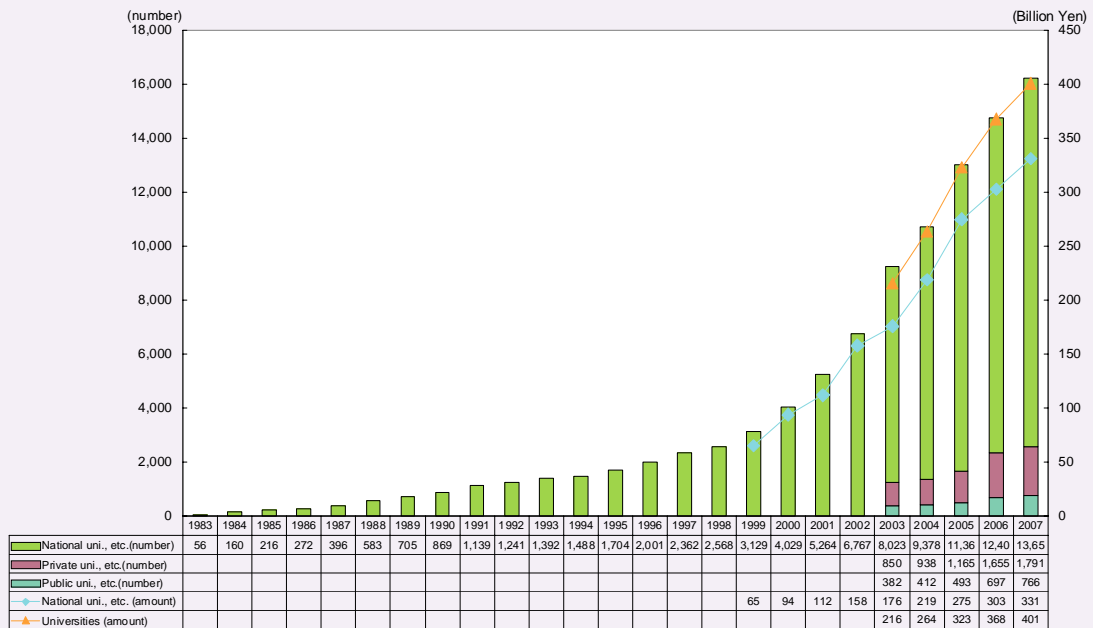
The above-mentioned projects and activities are expected to contribute to the creation of innovation in Japan.

(Deepening of industry-academia-government collaboration)

In line with the corporatization of national universities in April 2004, industry-government-academia collaboration made steady progress, with the number of research programs implemented jointly by universities and private-sector companies, etc. exceeding 16,000 in FY 2007 (Figure 2-3-11). Moreover, the number of patents licensed totaled 4,390 and the number of university-based venture companies totaled 1,775¹ as of the end of March 2008.

¹ Source: Prepared by the National Institute of Science and Technology Policy, MEXT

Figure 2-3-11 Trends in Number of Joint Research Projects and Amount of Funds Received



In order to further promote industry-academia-government collaboration in a strategic and organized manner in light of these results, NICT conducts research on industry-academia-government collaboration through its Advanced Testbed Network for R&D.

MEXT supports university researchers who attempt to conduct R&D that links basic research and research for product development, a stage of R&D that has insufficient support: valley of death. The ministry targets researchers whose research results can be expected to lead to entrepreneurial activities in the future and subsidizes their R&D expenses and the management expenses for preparing a business plan toward the establishment of a business. As of July 1, 2008, through 80 coordinators in universities, colleges of technology, and inter-university research institutes nationwide, MEXT supports industry-academia-government collaboration activities (promoting dissemination of feedback of research results to industry and regional society) (Figure 2-3-12).

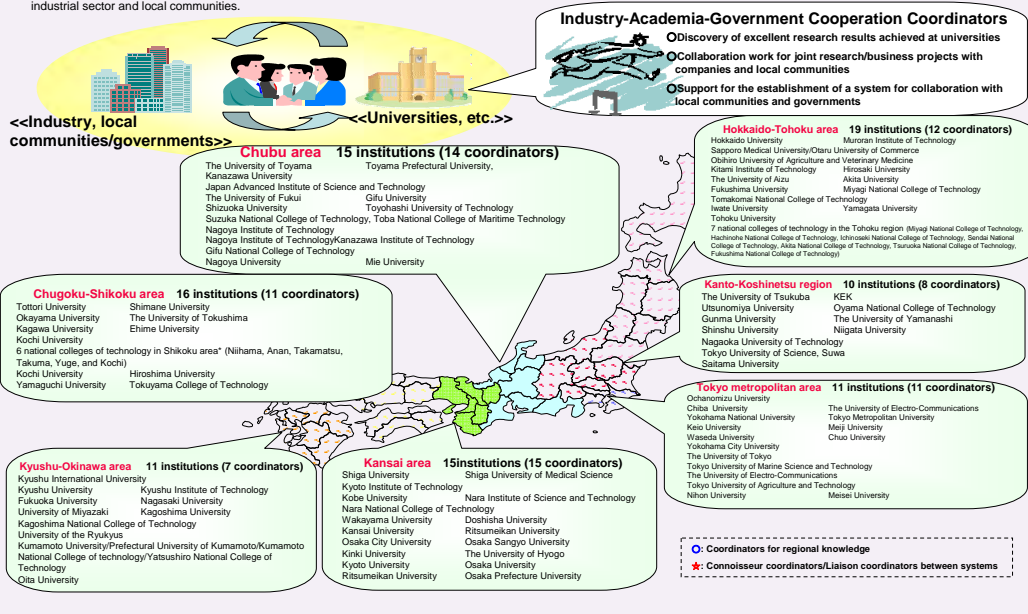
Figure 2-3-12

Organizations Supported by Industry-Academia-Government Cooperation Coordinators (As of July 2008)

Allocation schema of the Industry-Academia-Government Cooperation Coordinators (As of July 2008)

Coordinators	34
Coordinators for regional knowledge	22
Connoisseur coordinators/Liaison coordinators between systems	22
Coordinators covering broader area	2
Total	80

With regard to planning, contracts and liaison work related to joint research, personnel with expert knowledge and practical experiences (Industry-Academia-Government Cooperation Coordinators) in fields where universities lack relevant talents are allocated to in universities, while universities feed back research results to society by transferring knowledge to the industrial sector and local communities.



MAFF promotes research intended to realize commercialization and industrial use of technology seeds owned by independent administrative institutions through its agricultural biotechnology commercialization and industrialization research program. At the same time, the ministry holds agricultural business creation fairs in order to provide meeting places for companies, universities, independent administrative institutions, government agencies, etc. so that they can find business opportunities for joint research, product development, commercialization, technology transfers and new market entry in the agriculture, forestry, fisheries and food sectors. The ministry also implements a variety of different activities for promoting industry-academia-government collaboration, including promotion of matching through lectures, seminars, and exhibitions and coordination of joint research under cooperation with nonprofit organizations and other institutes organized by local companies, universities, local industrial research institutes, etc.

Under the leadership of Innovation Architects (office staff who has sufficient knowledge on research results and user needs, and drew up industrialization scenarios to adequately connect the knowledge and the needs) and under the AIST Industrial Transformation Research Initiative which intended to develop prototypes by concentrating technology, funds, and human resources after sharing the definite scenario covering processes from technology seeds to a new industry among companies, universities and AIST, AIST continued the project to create renewable energy industries, which should be the base of the sustainable society, and initiated a project for the mass production of power devices as a key technology for energy saving in the electric power field. Furthermore, AIST organized the AIST Innovation Partners to develop a network with the companies that had cooperated in the past, and thus enhanced collaboration with them. Meanwhile, competitive funds support joint R&D projects implemented by the industrial, academia and government sectors, in various stages of development, from basic research to applications/commercialization and for various purposes. Comprehensive projects supported by

competitive funds of specific ministries include: JST's Collaborative Development of Innovative Seeds, MAFF's Practical Technology Development Project for Promoting New Policy in Agriculture, Forestry and Fisheries [literal translation], METI's R&D project for creation and commercialization of university-based businesses [literal translation] and MOE's Environmental Technology Development Fund.

(Sustainable development of industry-academia-government collaboration)

- Building relationships of trust among industry, academia, and government -

To promote the strengthening of collaboration among industry, academia, and government, it is essential to bring about a state of common recognition between industry and public research institutions, including universities. To this end, the government provides opportunities for dialogue between companies and universities, while research institutions, including universities, announce research results and disclose other information by holding conferences, issuing periodical publications such as annual reports, contributing papers to academic journals and disclosing patents.

Furthermore, MEXT and METI, in cooperation with JST and NEDO, held the Innovation Japan 2008: University Fair, a nationwide industry-academia matching event to disseminate research results of universities and public research institutions in the field of the state-of-the-art technologies to industry, etc.

- Promotion of voluntary initiatives by universities, etc. -

In order to enhance the system for the creation, protection, and utilization of strategical, intellectual property at universities (actively supporting the acquisition of basic patent rights internationally, development of intellectual property activity system through cooperation between universities, and other activities), MEXT established the Industry-Academia-Government Collaboration Strategic Development Project [literal translation] (55 programs, 66 organizations) in FY 2008.

In promoting collaboration between industry, academia, and government, it is extremely important to appropriately deal with any conflict of interest¹ that may arise in universities and research institutions on a daily basis.

In particular, since clinical research and clinical trials require further more cautious reactions, MEXT held the Third Workshop on Ethics and Conflict of Interest in Clinical Research [literal translation] in December 2008, thus promoting formulation of policies at universities.

Moreover, MEXT announced strategies for dealing with the Foreign Exchange and Foreign Trade Act, how intellectual properties belong to students, how to address the protection of confidentiality the current state of research, and problems with material transfer in universities, thus prompting universities and other organizations to establish voluntary initiatives.

- Revitalization and enhancement of collaboration between University Intellectual Property Headquarters and technology licensing organizations (TLOs) -

Based on the Act on the Promotion of Technology Transfer from Universities to Private Business Operators (Act No. 52 of 1998), 46 TLOs were authorized as of April 1, 2009. The number

¹ Conflict of interest : A concept that includes the following two situations: (1) the situation where interest that a faculty staff or a university will obtain through industry-academia-government collaboration activities (license fee, compensation from projects, unlisted stocks, etc.) and responsibility of education and research at university collide and conflict; and (2) the situation where a faculty staff holds responsibility to enterprises, etc. for performing duties mainly through project activities, and the responsibility of performing duties and that to enterprises, etc. cannot go together.

of patents licensed was 2,305 by March 2008 (Table 2-3-13).

In recent years, national university corporations have exerted effort for university-TLO cooperation enhancement such as the establishment of TLOs inside corporations, the change of external TLOs into internal ones, and funding to authorized TLOs.

Table 2-3-13 List of Authorized TLOs

As of April 2009: 46 institutions authorized as TLOs

	TLO	Corporate status	Date of authorization	Name of participating university	
External-type (8)	Toudai TLO (CASTI)	Corporation	Dec. 4, 1998	The University of Tokyo	
	The Foundation for the Promotion of Industrial Science	Foundation	Aug.30, 2001	Institute of Industrial Sciences, The University of Tokyo	
	Tokyo University of Agriculture and Technology TLO, Co. Ltd.	Corporation	Dec. 10, 2001	Tokyo University of Agriculture and Technology	
	Campus Create. Co., Ltd.	Corporation	Feb. 19, 2003	The University of Electro-Communications	
	Toyohashi Campus Innovation Inc.	Corporation	Sep. 5, 2005	Toyohashi University of Technology	
	Innovation Promoting Firm for Kobe University, LLC	Limited liability company	Apr. 1, 2008	Kobe University	
	Yamaguchi Technology Licensing Organization Co., Ltd.	Limited company	Dec. 9, 1999	Yamaguchi University	
	Kyushu TLO Company, Ltd.	Corporation	Apr. 19 2000	Kyushu University	
Regional-type (22)	Tohoku Techno Arch Co., Ltd.	Corporation	Dec. 4, 1998	Tohoku University and other universities in the Tohoku area	
	Technology Advanced Metropolitan Area Technology Licensing Organization	Corporation	Dec. 4, 2000	Tokyo metropolitan area universities	
	Yokohama TLO Co., Ltd.	Corporation	Apr. 25, 2001	Yokohama National University, Yokohama City University, and other universities in Kanagawa prefecture	
	Niigata Technology Licensing Organization Co., Ltd.	Corporation	Dec. 25, 2001	Niigata University and other universities in Niigata prefecture	
	Omni Institute Corporation	Corporation	Feb. 24, 2005	Nagaoka University of Technology, Nagaoka National College of Technology, The University of Hyogo	
	KUTLO (Kanazawa University Technology Licensing Organization)	Limited company	Dec. 26, 2002	Kanazawa University and other universities in Ishikawa prefecture and the Hokuriku area	
	SHINSHU Technology Licensing Organization	Corporation	Apr. 18, 2003	Shinshu University, Nagano National College of Technology	
	Hamamatsu Foundation for Science and Technology PROMOTION	Foundation	Jan. 17, 2002	Shizuoka University and other universities in Shizuoka prefecture	
	Nagoya Industrial Science Research institute (Chubu TLO)	Foundation	Apr. 19, 2000	Nagoya University and other universities in the Chubu area	
	Mie TLO (Mie Technology Licensing Organization)	Corporation	Apr. 16, 2002	Mie University and other universities in Mie prefecture	
	Kansai Technology Licensing Organization Co., Ltd.	Corporation	Dec. 4, 1998	Kyoto University, Ritsumeikan University, etc.	
	Osaka Industrial Promotion Organization	Foundation	Aug.30, 2001	Osaka University and other universities in Osaka prefecture	
	New Industry Research Organization (TLO Hyogo)	Foundation	Apr. 19, 2000	Kobe University and other universities in Hyogo prefecture	
	Okayama Prefecture Industrial Promotion Foundation	Foundation	Apr. 28, 2004	Okayama University and other universities in Okayama prefecture	
	Hiroshima Industrial Promotion Organization	Foundation	Oct. 9, 2003	Hiroshima University and other universities in Hiroshima prefecture	
	Techno Network Shikoku Co., LTD.	Corporation	Apr. 25, 2001	Universities in the Shikoku area	
	Kitakyushu Technology Center Co., LTD.	Foundation	Apr. 1, 2002	Kyushu Institute of Technology and other universities in the Northern Kyushu region	
	Nagasaki Technology Licensing Organization	Corporation	Oct. 15, 2004	Nagasaki University and other universities in Nagasaki prefecture	
	Kumamoto Technology and Industry Foundation	Foundation	Aug.30, 2001	Kumamoto University and other universities in Kumamoto prefecture	
	Oita Technology Licensing Organization, Ltd.	Limited company	Aug.26, 2003	Oita University and other universities in Oita prefecture	
	Miyazaki TLO	Corporation	May. 16, 2003	The University of Miyazaki and other universities in Miyazaki prefecture	
	Kagoshima Technology Licensing Organization Co., Ltd.	Corporation	Feb. 19, 2003	Kagoshima University and other universities in Kagoshima prefecture	
Internal-type (16)	School corporation (8)	Keio University Intellectual Property Center	School corporation	Aug.26, 1999	Within the university organizations
		Industry-Academia-Government Collaboration Center, Tokai University [literal translation]	School corporation	Mar. 21, 2008	Within the university organizations
		Tokyo Denki University Center for Research Collaboration	School corporation	Jun. 14, 2000	Within the university organizations
		RIDAI-SCITEC	School corporation	Sep. 30, 2003	Within the university organizations
		Nihon University Business, Research and Intellectual Property Center (NUBIC)	School corporation	Dec. 4, 1998	Within the university organizations
		NMS-TLO Center	School corporation	Feb. 19, 2003	Within the university organizations
		Meiji University Intellectual Property Center	School corporation	Apr. 25, 2001	Within the university organizations
		Waseda University Intellectual Property Center	School corporation	Apr. 16, 1999	Within the university organizations
	National university corporation (8)	Gunma University TLO	National university corporation	Dec. 18, 2007	Within the university organizations
		Organization for Academic-Industrial Collaboration and Intellectual Property, Chiba University	National university corporation	Jul. 7, 2006	Within the university organizations
		Technology Licensing Organization, Intellectual Property Division, Tokyo Medical and Dental University	National university corporation	Mar. 31, 2008	Within the university organizations
		Office of Industry Liaison, Tokyo Institute of Technology	National university corporation	Apr. 2, 2007	Within the university organizations
		Liaison Office, the University of Toyama	National university corporation	Jun. 12, 2007	Within the university organizations
		Industry-Academia-Government Collaboration and Research Promotion Department, Industry-Academia-Government Collaboration and Research Promotion Institution, University of Yamanashi [literal translation]	National university corporation	Apr. 1, 2008	Within the university organizations
		Saga University TLO	National university corporation	Jul. 7, 2005	Within the university organizations
		Industry-Government-Academia Collaboration Group, Nara Institute of Science and Technology	National university corporation	Dec. 18, 2007	Within the university organizations

- Smooth implementation of intellectual property-related activities -

To encourage the practical use of R&D results obtained at universities, research institutions, etc., JST offers a series of comprehensive programs covering the identification of exceptional research results, support for patenting, etc. JST comprehensively implements the Technology Transfer Support Center projects which support technology transfer-related activities. Such projects include: support of strategic international patenting of research results obtained at universities; rendering of development services and licensing of research results including patents; fostering of human resources who should play a fundamental part of these activities; and supporting the smooth connection of research results to the next step of practical application (connecting mechanism) through evaluation and analysis of applications and expansibility of research results. Furthermore, concerning research results of universities and public research institutes, JST implements various R&D programs (including the Project to Develop "Innovative Seeds") according to technology phases or styles of technology transfer, and it also implemented a new program to promote development for practical application of innovative medicinal products and medical devices.

(4) Promotion of foundation of R&D-oriented ventures

Thanks to efforts by the industrial, academic and government sectors with regard to university-based venture companies, more than 1,700 venture companies¹ have so far been established nationwide. JST implemented the Project to Develop "Innovative Seeds" (Creation and Support Program for Start-ups from Universities)" as part of its effort to support research related to the creation of university-based start-ups, with 85 new start-ups established by the end of January 2009.

RIKEN established a system to promote rapid dissemination and practical use of research results through preferential treatment in joint research intended for venture businesses, which are established by researchers based on their own research results.

MAFF, with a view to promoting the creation of new industries and foundation of start-up companies, provides support to R&D projects by researchers at private companies, universities, etc. that aim to found biotechnology venture companies by taking advantage of their unique ideas and research seeds.

METI provides support for not only promoting quantitative expansion, but qualitative enhancement in building networks for supporting university-launched venture businesses by executing the Program for Development of Wide-Area Network for Supporting New Businesses [literal translation].

(5) Promotion of R&D by private companies

It is private companies that create market value from the results of R&D and industry-academia- government collaboration in the form of new products and achieve ultimate realization of innovation. Therefore, it is important to revitalize R&D activities of private companies. The government, while respecting the principle of voluntary efforts by private companies, stimulates their motivation by utilizing a tax system that facilitate R&D and enhancing technology development support programs that reduce the risks involved in the R&D process that leads up to commercialization.

¹ Source: Prepared by NISTEP, MEXT

(Promotion of private-sector R&D activities through tax support)

To promote research activities by the private sector, various preferential tax measures are provided as shown in the table below. In the FY 2009 tax system revision, the Industrial Technology Enhancement Act was partially revised. The special tax credit system for experiment and research expenses added new types of expenses to the range of special experiment and research expenses: (1) expenses related to experiments and research specified in the revised Act which are to be executed cooperatively with independent administrative research institutions, and (2) expenses related to the experiments and research to be entrusted to these institutions (Table 2-3-14).

Table 2-3-14 Major Preferential Tax System for S&T Promotion

Item	Purpose	Details	Applicable law	Date of enactment and validity
R&D taxation system	Promotion of research and development investment by the private sector, etc.	Tax Credit for research and development expenditures	Special Taxation Measures Act, Article 10 (income tax), Article 42-4, Article 68-9 (corporation tax), Local Tax Act, Supplementary Provision, Article 8, Item 1.	Enacted in FY2003
		I. Proportional Tax Credits for total research and development expenses		
		(1) The research and development credit is a percentage (8 to 10%) of the total of research and development expenses. The maximum amount is the sum of 20% of the corporation tax liability.		
		(2) Same for individual businesses (Income tax)		
		II. Special Tax Credit on special research and development expenditures		
		(1) For joint experimentation and research with and experimentation and research commissioned to universities, public experiment and research institutes, the National Experiment and Research Institute, and other organizations, in addition to Item I above, tax equivalent to 12% of these research and development expenses regarding such experiment and research is exempted (but limited to an amount equivalent to 20% of the corporation tax, including the special tax exemption in Item I above.) (Corporation tax)		
		(2) Same for individual businesses (Income tax)		
		III. Tax system to strengthen the technical base of SMEs (Applied instead of I or II)		Enacted in FY1985
		(1) The tax credit amount is a value equivalent to 12% of test and research expenses at SMEs (but limited to a value equivalent to 20% of corporation tax) (corporation tax).		
		(2) Same for individual businesses (Income tax)		
		(3) The tax credit amount in (1) above is excluded from the tax base for corporate inhabitants tax (Local tax).		
		IV Proportional Tax Credits for increased research and development expenses		Enacted in FY 2008 (Effective through FY2009)
		(1) Either of the following (a) or (b) will be selected and applied (but limited to an amount equivalent to 10% of the corporation tax, apart from I through III) (corporation tax)		
		(a) When the amount of experimental and research expenses exceeds the average of experiment and research expenses for the current term and for three years before the current term and exceeds the largest amount out of experiment and research expenses for two years before the current term, the tax equivalent to 5% of the amount exceeding the average is exempted.		
		(b) When the amount of experimental and research expenses exceeds 10% of sales amount for the current term and for three years before the current term, the tax is exempted in a predefined proportion to the excessive amount.		
		(2) Same for individual businesses (Income tax)		

(Promotion of private-sector R&D activities through government subsidies)**1) Innovation commercialization support program** [literal translation]

To support efforts for development intended for commercialization of technology seeds owned by private companies, government subsidies are provided through NEDO to private companies, which execute development for commercialization in the fields designated as policy priorities by the Basic Plan, with due consideration for the status of utilization of other management resources. The provision of the subsidies is conducted after information concerning the status of the fund recipient companies' management of intellectual property is obtained from their managers to ensure their management (intellectual property management) makes the maximum use of the research results.

2) System for the support of private-sector infrastructure technology research [literal translation]

In order to promote experimental research into infrastructure technologies conducted in private sectors related to the mining, manufacturing, electro-communications and broadcasting industries, applications were accepted: subjects concerning electro-communications and broadcasting technologies are continuously supported through NICT, and those concerning mining and manufacturing technologies through NEDO under the contract research program.

3) Industrial technology research development program [literal translation]

With a purpose of commercializing advanced technology seeds owned by SMEs, technology development was conducted through joint research with public research institutions. More specifically, research applications related to the inspection and measuring equipment to be procured by AIST, which received the commission, were accepted, and the equipment was commercialized and market launched in cooperation with SMEs.

4) Program for the promotion of eco-innovation and the discovery/verification of innovative technologies against global warming [literal translation]

With the purpose of realizing sustainable development that achieves a balance between solving environmental problems and economic growth, we have executed research for the discovery of seeds by public offering on the theme of eco-innovation (environment-oriented and human-oriented technological innovation and social innovation) and the promotion of innovative solutions to global warming. In the future, verification experiments on social systems for the realization of a low-carbon society.

(Support program for intellectual fusion (Intellectual Café))

METI compiled the collection of practices concerning advanced intellectual fusion and had its dissemination activities concerning the fusion of different-field technologies and intellectual fusion, which are required for creating innovation. METI held the Intellectual Café International Symposium under the co-sponsorship with OECD and Nikkei Inc. in November 2008, and held regional seminars.

(Program for new technology development to activate the agriculture, forestry, fisheries and food industries by industry-academia-government collaboration)

In order to support to create new industries and businesses in the agriculture, forestry, fisheries, and food sectors and resolve various problems and policy issues faced by the food industry, the development of new technologies conducted by private enterprises is promoted through collaborations with universities and public organizations by utilizing technology seeds owned by such organizations.

(Program for the promotion of private-sector commercialization research)

Contract R&D programs in the commercialization stage are implemented in the private sector in order to facilitate the development of revolutionary bio-oriented technologies that help to enhance the agriculture, forestry, fisheries, beverage/food and brewing industries.

[Small Business Innovation Research (SBIR)]

The Small Business Innovation Research (SBIR) system is intended to provide consistent support to R&D activities of SMEs and commercialization of their research results through inter-ministerial collaboration. Under this system, efforts are underway to increase opportunities for providing subsidies and paying entrustment fees related to R&D for new technologies that enable SMEs to engage in new business operations. In addition, patent fees are reduced and the quotas for loan guarantees are expanded. In FY 2008, seven ministries of MIC, MEXT, MHLW, MAFF, METI, MLIT and MOE designated a total of 91 cases as eligible for special subsidies, and set the goal of providing about 40 billion yen to SMEs.

4 Building Regional Innovation Systems and Creating Regions Full of Vitality

Regional promotion of S&T helps to revitalize local industries and enhance local residents' quality of life, which in turn contributes to the advancement and diversification of S&T in Japan as a whole and the enhancement of the competitiveness of the country's systems for innovation.

Prefectural governments establish councils in charge of deliberating S&T policies and make active contributions to the S&T promotion by formulating their own plans and guidelines related to S&T (Tables 2-3-15 and 2-3-16).

Table 2-3-15 Science and Technology Councils Established at Local Governments

Prefecture/ designated city	Name
Hokkaido	Hokkaido Science and Technology Council (September 1952 -)
Aomori	Aomori Industry, Science and Technology Council (December 1997 - May 1999) - Aomori Research and Development Conference (June 1999 - March 2007)
Akita	Akita Council for Science and Technology (August 2002 -)
Iwate	Iwate Science and Technology Promotion Council (April 1989 - March 2000) - Iwate Conference on Guidelines for Promoting Science and Technology (April 2000 - March 2001) [literal translation]
Miyagi	Miyagi Conference on Guidelines for Promoting Science and Technology (July 1998 - March 1999)
Yamagata	Yamagata Science and Technology Council (April 1999 -)
Fukushima	Fukushima Science and Technology Promotion Council (May 1997 -)
Ibaraki	Ibaraki Science and Technology Promotion Council (September 2003 -)
Tochigi	Tochigi Science and Technology Promotion Council (July 1999 -)
Gunma	Gunma Science and Technology Promotion Headquarter (September 1999 -)
Saitama	Saitama Science and Technology Council (January 1995 -)
Chiba	Chiba Science Council (November 1994 -)
Kanagawa	Science and Technology Council (June 1988 -)

Prefecture/ designated city	Name
Niigata	Niigata Science and Technology Council (April 1998 -)
Toyama	Toyama Science and Technology Council (November 1983 -)
Ishikawa	Ishikawa Industrial Science and Technology Council (December 1997-October 2003) - Ishikawa Industrial Innovation Council (November 2003 -)
Fukui	Fukui Science and Technology Promotion Council (April 1998 - March 2004) Council for Fukui Production Planning Strategy (May 2004 -)
Yamanashi	Yamanashi Science and Technology Council (September 1991 -)
Nagano	Nagano Prefecture Investigative Commission on Science and Technology Industry Promotion Initiative (October 1999-December 1999)
Gifu	Gifu Science and Technology Promotion Council (July 1996 -)
Aichi	Aichi Science and Technology Council (February 2000 -)
Mie	Mie Science Academy Representative Conference (April 2001 - May 2005) - Science and Technology Exchange Council (June 2005 - March 2007) - Science and Technology Promotion Conference (April 2007 - January 2008)
Shiga	Shiga Science and Technology Promotion Council (April 2003 -)
Kyoto	Kyoto Science and Technology Council (September 1961 -)
Osaka	Osaka Science and Technology Roundtable (December 1986 -)
Hyogo	Hyogo Science and Technology Council (April 2000 -)
Nara	Nara Prefecture Committee on Guidelines for Science and Technology Promotion (August 2007 - March 2008) - Nara Prefecture Science and Technology Promotion Conference (To be established in FY 2008)
Wakayama	Wakayama Prefecture Science and Technology Strategy Council (September 2004 -)
Tottori	Tottori Science and Technology Promotion Council (March 1999 - December 2002)
Shimane	Shimane Science and Technology Promotion Council (October 1998 -)
Hiroshima	Hiroshima Science and Technology Promotion Conference (May 1992 - March 1994)
Yamaguchi	Yamaguchi Science and Technology Promotion Conference (May 1991 -)
Kagawa	Kagawa Science and Technology Council (August 1997 -)
Ehime	Ehime Science and Technology Promotion Council (July 2001 -)
Tokushima	Tokushima Forum for the Promotion of a Vision for a Science and Technology (June 1998 - March 1999) - Tokushima Prefecture Science and Technology Promotion Plan Formulation Committee (March 2008 -)
Kochi	Kochi Science and Technology Academy (January 2004 -March 2006)
Saga	Saga Science and Technology Council (February 1996 -)
Nagasaki	Nagasaki Science and Technology Promotion Council (October 1998 -)
Kumamoto	Kumamoto Science and Technology Council (September 1999 -)
Oita	Oita Science and Technology Promotion Committee (June 2002 - March 2003)
Miyazaki	Miyazaki Science and Technology Council (August 2001 -)
Kagoshima	Kagoshima Science and Technology Promotion Council (April 2003 -)
Okinawa	Council for Promotion of Science in Okinawa (January 1995-March 2007) -Okinawa Science and Technology Council (October 2007 -)
Kawasaki City	Kawasaki City Innovation Promotion Meeting (August 2003 - March 2006)
Yokohama City	Yokohama City Council for Promotion of Cooperation between Industry and Academia (October 1999 - March 2003)
Kyoto City	Kyoto City Conference on Projects for Promoting Industry, Science and Technology (August 2005 - September 2006) -Kyoto City Committee on Promotion of Industrial Science and Technology (July 2007 -)
Osaka City	Osaka Science and Technology Promotion Advisers Council (July 2008 -) [literal translation]
Hiroshima City	Hiroshima City Science and Technology Advisory Council (October 2003 -)
Kitakyushu City	Kitakyushu City Science and Technology Promotion Council (November 2002 - March 2004)
Fukuoka City	Fukuoka City Adviser Meeting on Vision for Promotion of Science and Technology (September 2001 - June 2002)
Aichi	Aichi Science and Technology Council (February 2000 -)

Table 2-3-16 Science and Technology Promotion Policies at Local Governments

Prefecture/ designated city	Name
Hokkaido	- Hokkaido Science and Technology Promotion Code (April 1999 - March 2008) - Hokkaido Science and Technology Promotion Strategy (August 2008 - March 2013) [literal translation]
Aomori	Guidelines for Promoting Industry, Science and Technology in Aomori Prefecture (December 1998 - March 2007)
Akita	Basic Concept for Science and Technology in Akita Prefecture (June 2000 -)
Iwate	Guidelines for Promoting Science and Technology in Iwate Prefecture (May 1990 - October 2000) -New Guidelines for Promoting Science and Technology in Iwate Prefecture (November 2000 -)
Miyagi	Guidelines for Promoting Science and Technology in Miyagi Prefecture (March 1999 -)
Yamagata	General Outline of Science and Technology Strategies in Yamagata Prefecture (FY1999-FY2005) -General Outline of Science and Technology Strategies in Yamagata Prefecture (FY2006-FY2015)
Fukushima	General Outline of Science and Technology Strategies in Fukushima Prefecture (March 2002 -)
Ibaraki	General Outline of Science and Technology Strategies in Ibaraki Prefecture (March 1994 - February 2005) -Guidelines for Promoting Science and Technology in Ibaraki Prefecture (March 2005 -)
Tochigi	Tochigi Guidelines for Promoting Science and Technology in Tochigi Prefecture (December 1998 -)
Gunma	Guidelines for Promoting Science and Technology in Gunma Prefecture (March 1999 -)
Saitama	Saitama First Saitama Technology Policy for the 21st Century (February 1998 - March 2007) -Second Saitama Technology Policy for the 21st Century (April 2007 - March 2012)
Chiba	General Guidelines for Chiba Science Plan (February 1996 -)
Tokyo	Tokyo Metropolitan Government Guidelines for the Promotion of Industrial Science and Technology (February 2004 - March 2009) -Tokyo Metropolitan Government Guidelines for Promotion of Science and Technology (Revised Version) (April 2008 - March 2013)
Kanagawa	Kanagawa General Guideline for Kanagawa Science and Technology Sixth Plan (May 1990 -, January 1997 -, March 2002 -, February 2007 -)
Niigata	General Outline of Science and Technology in Niigata Prefecture (March 1998 -)
Toyama	Toyama General Guidelines for Toyama Science and Technology (October 1991- March 2001) -New Toyama Prefecture Science and Technology Plan (FY2001-FY2010) -New Toyama Prefecture Science and Technology Plan (Revised Edition) (FY2007-FY2015)
Ishikawa	Guidelines for Promoting Industry, Science and Technology in Ishikawa Prefecture (February 1999-February 2005) -Ishikawa Innovating Industry Strategies (March 2005 -)
Fukui	Guidelines for Promoting Science and Technology in Fukui Prefecture (January 1998-February 2005) -Basic Policy for Creating a Leading-Edge Technology Mecca (March 2005 -)
Yamanashi	Yamanashi Science and Technology Sixth Plan (March 1992 -) / Yamanashi Plan for Promoting Science and Technology (March 1999-February 2008) - Yamanashi Science and Technology Basic Plan (March 2008-March 2013)
Nagano	Nagano Prefecture Guidelines for Promotion of Science and Technology (April 2000 -)
Gifu	Basic Strategies for Science and Technology in Gifu Prefecture (March 1997 - February 2002, March 2002 - February 2007) -Plan for Promoting Science and Technology in Gifu Prefecture (March 2007 - February 2012)
Shizuoka	Vision for Promoting Science and Technology in Shizuoka Prefecture (February 2000 - March 2010)
Aichi	General Guidelines for Promoting Science and Technology in Aichi Prefecture (March 1999 - March 2011)/The First Aichi Science and Technology Basic Project (March 1999 - March 2006 - The Second Aichi Science and Technology Basic Project (April 2006 - March 2011) [literal translation])
Mie	Vision for Promoting Science and Technology in Mie Prefecture (July 1999 -)
Shiga	Shiga Science and Technology Plan (October 2004 -)
Kyoto	Promotion Plan for Industry and Technology in Kyoto (February 1995 -)
Osaka	Osaka Research and Development Charter Guidelines for Industry, Science and Technology in Osaka (March 1988 - February 1998) -Guidelines for Promoting Industry, Science, and Technology in Osaka (March 1998 - February 2006) -Strategies Promoting Science and Technology in Osaka Metropolitan Area (March 2006 -)
Hyogo	General Guidelines for Hyogo Science and Technology Sixth Plan (March 1991- February 1998) -New General Guideline for Hyogo Science Technology Plan (March 1998 -)
Nara	Guidelines for Promoting Science and Technology in Nara Prefecture (April 2003- March 2008, April 2008 -)
Wakayama	Vision for Promoting Science and Technology in Wakayama Prefecture (March 2000 -)
Tottori	Investigative Report on the Promotion of Science and Technology in Tottori Prefecture (March 1998 -)
Shimane	Guidelines for Promoting Science and Technology in Shimane Prefecture (March 1999 -)
Okayama	Guidelines for Promoting Science and Technology in Okayama Prefecture (March 1998 -)
Hiroshima	Fundamental Principles of the Promotion of Science and Technology in Hiroshima Prefecture (November 1993 -)
Yamaguchi	Yamaguchi Guidelines for the Promotion of Science and Technology in Yamaguchi Prefecture (March 1994 -)
Tokushima	Vision for Promoting Science and Technology in Tokushima Prefecture (March 1999 - March 2007), - Tokushima Science and Technology Promotion Project (December 2008 - March 2013) [literal translation]
Kagawa	Vision for Promoting Science and Technology in Kagawa Prefecture (March 1997- March 2001, March 2001-March 2006)
Ehime	Guidelines for Promoting Science and Technology in Ehime Prefecture (March 2001-Revised in May 2007 -)
Kochi	Guidelines for Promoting Science and Technology in Kochi Prefecture (March 1998 -)

Prefecture/ designated city	Name
Fukuoka	Guidelines for the Creation of a S&T Fukuoka Prefecture (March 1999 -)
Saga	Vision for Promoting Science and Technology in Saga Prefecture (March 1997 -)
Nagasaki	Vision for Promoting Science and Technology in Nagasaki Prefecture (June 1998 -)
Kumamoto	Kumamoto Guidelines for Promoting Science and Technology in Kumamoto Prefecture (May 1999-February 2004, March 2004 -)
Oita	Guidelines for Promoting Science and Technology in Oita Prefecture (April 2003-March 2013)
Miyazaki	Guidelines for Promoting Industry, Science, and Technology in Miyazaki Prefecture (March 2001 -)
Kagoshima	Guidelines for Promoting Science and Technology in Kagoshima Prefecture (March 2003 -)
Okinawa	General Guidelines for Science and Technology Promotion in Okinawa Prefecture (February 2000-July 2005) -Guidelines for Promoting Science and Technology in Okinawa Prefecture (2005-2011) /Okinawa Science and Technology Promotion Project (March 2008 - 2011) [literal translation]
Sapporo City	Vision for Promoting Science and Technology in Sapporo City (June 2004 -)
Kawasaki City	Guidelines for Promotion of Science and Technology in Kawasaki City (March 2005 -)
Yokohama City	Guidelines for Promoting Science and Technology in Yokohama City (August 1999 -)
Kyoto City	Concept for Super Technology in Kyoto City (March 2002-2010) / Plan for Promoting Industrial Science and Technology in Kyoto City (October 2006 -2010)
Osaka City	Osaka Science and Technology Promotion Policy (tentative name) (To be established in March 2009) [literal translation]
Hiroshima City	Hiroshima City Science and Technology Policy (June 2003 -)
Kitakyushu City	Brief Guidelines for Promotion of Science and Technology in Kitakyushu City (August 2003 -)
Fukuoka City	Vision for Promoting Science and Technology in Fukuoka City (June 2002 -)

The Third Science and Technology Basic Plan calls for competition-based support for activities related to the formation of clusters under regional initiatives so as to establish regional systems for innovation and build communities full of vitality. The plan also calls for efforts to overcome the wall of segregation among ministries and agencies and increase inter-ministerial collaboration in order to ensure smooth implementation of S&T-relate measures in regions.

Described below is an overview mainly of measures promoted by the government to support regional S&T promotion.

(1) Formation of regional clusters

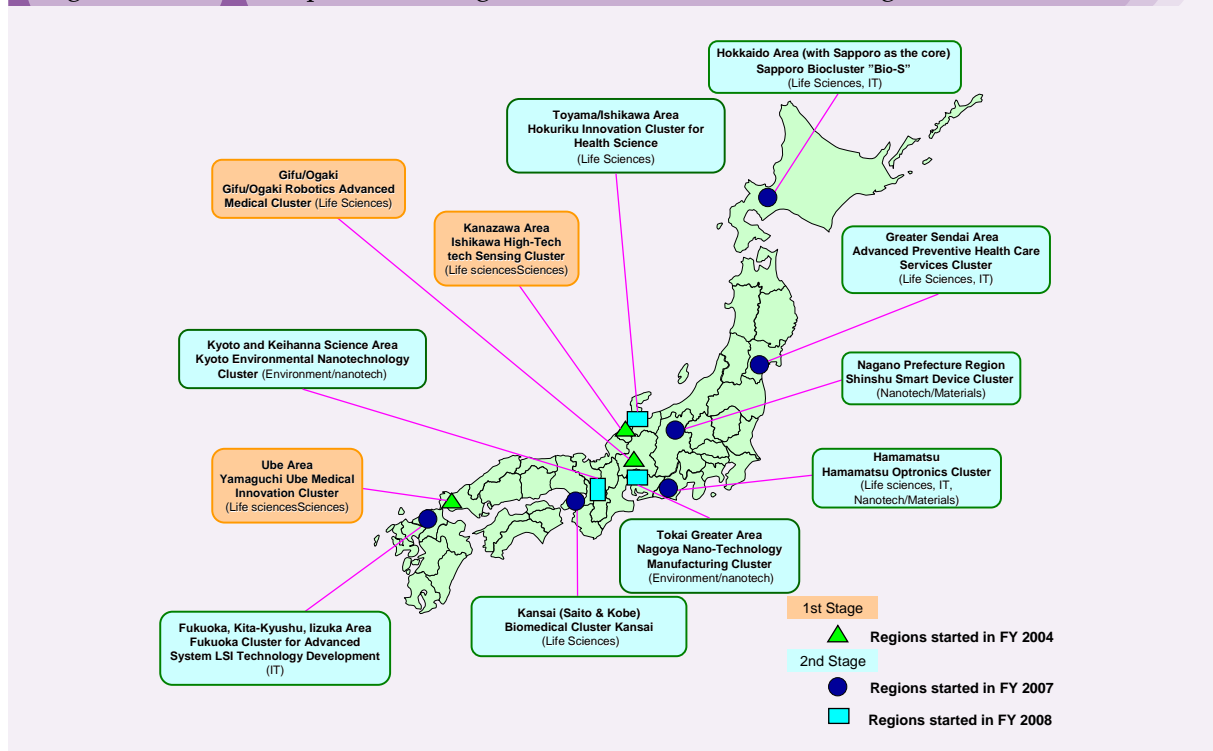
(Efforts toward the formation of Knowledge Clusters)

1) Efforts toward the formation of world-level clusters

MEXT implemented the Knowledge Cluster Initiative: The First Stage since FY 2002: in FY 2008, projects in three regions were implemented. All the projects in 18 regions were completed in FY 2008.

From FY 2007, the Second Stage was started, based on the achievements of the First Stage. It strongly promotes formation of the world-level clusters from the viewpoint of “selection and concentration” while encouraging regional autonomy, and newly adopted three regions in FY 2008 (Figure 2-3-17).

Figure 2-3-17 Map of Knowledge Clusters: The First/Second Stages



2) Efforts toward the formation of clusters featuring local characteristics

Since FY 2002, MEXT implemented, from the viewpoint of taking advantage of the individuality of regions, the City Area Program, which aims to create new businesses and foster R&D-oriented regional industries by producing new technology seeds with the use of the "wisdom" of universities. This program has two categories of Basic Stage and Development Stage. The Development Stage is conducted in regions where its implementation at the Basic Stage has been completed with outstanding results. A total of 80 regions have been funded under this program by FY 2008.

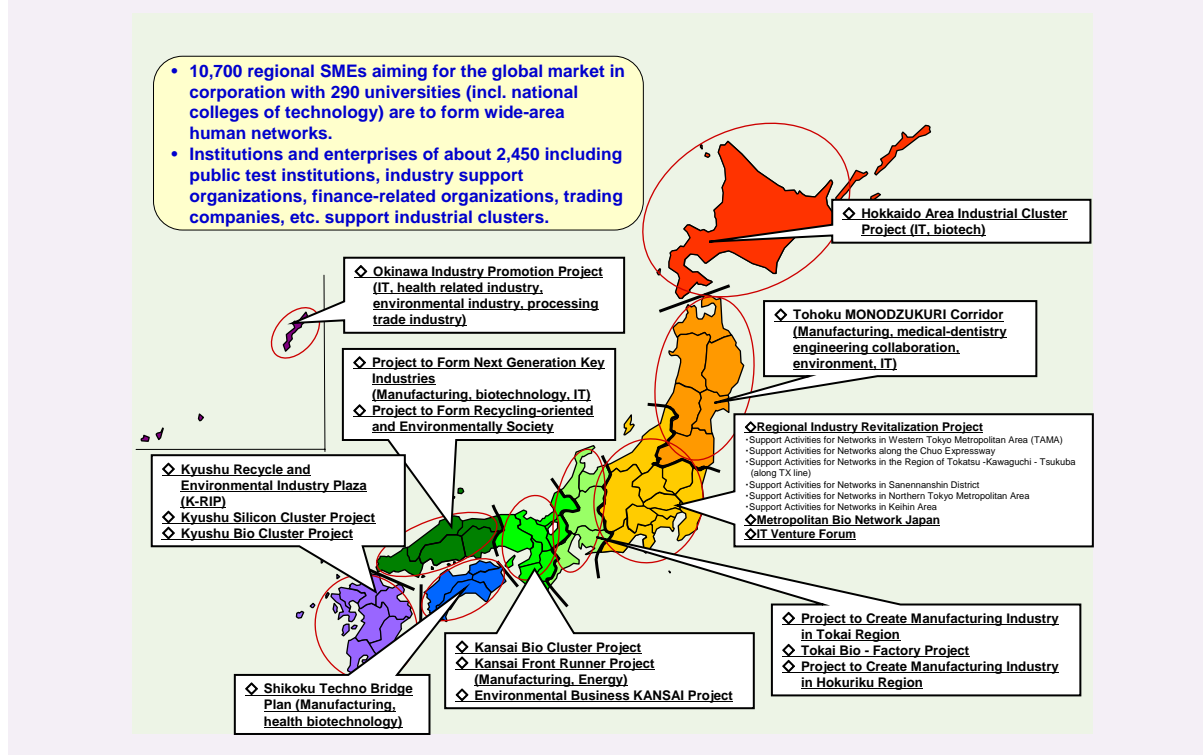
(Efforts toward the formation of Industrial Clusters¹)

METI's Industrial Cluster Project involves the regional Bureaus of Economy, Trade, and Industry as the hubs of the formation of wide-area human networks of industry, academia, and government, including local enterprises, universities, etc., aiming for participation in world markets, and that uses comprehensive and effective implementation of regional measures to form industrial clusters that can foster new business enterprises capable of competing in worldwide markets. Specifically, by executing 18 projects nationwide, METI forms wide-area personal networks of about 2,450 supporters of industrial cluster including 17,000 SMEs having ambitions to enter into world markets, universities, public test and research institutions, industry supporting institutions, institutions related to finance and trading companies, dramatically improving quality and quantity of information being distributed among industry, academia and government and complementing management resources such as technologies, management information, and marketing channels, thus supporting technology development that makes the best use of regional characteristics. For the industrial cluster measures, promotion organizations

¹ Industrial Cluster is a system that takes the technological innovation of universities and other public research institutions, and of companies in the surrounding area and encourages wider area cooperation between universities and companies, and between different companies, to create a chain reaction of innovation and creation of new businesses and industries.

have been established for each project, which promote formation of the industry-academia-government network (Figure 2-3-18). Additionally, subsidies are provided to a promotion organization and other organizations (core organizations) which support the creation of new enterprises through the formation of human networks in certain regions and sectors, and the deployment of cluster managers who comprehensively coordinate cluster's activities.

Figure 2-3-18 Industrial Cluster Project: 18 Projects (The Second Stage)



(2) Smooth development of regional measures for S&T

MEXT works to promote joint research, etc. among industry, academia, and government focusing on universities and other institutions in regional areas to create new technology seeds. METI works to open up new fields for businesses, and to create start-ups and new products by promoting collaboration projects among industry, academia, and government, such as technology development that leads to practical applications, focusing on companies.

The two ministries cooperatively enhance industry-academia collaboration in regions, provide new technology seeds and feed back information concerning market needs to R&D activities.

These ministries provide opportunities for information sharing and opinion exchange among persons related to the two ministries, and they hold regional meetings of the joint achievement rollouts of projects implemented by themselves. In addition, in FY 2008, they held the Cluster Japan 2008, which held symposiums to discuss promotion measures of the cluster policy as well as exhibited achievements of the nationwide clusters in Yokohama, and also held the Regional Cluster Seminars for discussing strategies for forming clusters set out by respective regional areas in three locations in Japan.

In addition, close collaboration is being promoted through CSTP's Regional S&T Cluster PT [literal translation], Regional Block Conference on Regional Science and Technology [literal translation], etc.

(Various measures for regional S&T promotion)

Government ministries and agencies implement various measures for regional S&T promotion (Table 2-3-19). Main measures concerned are as follows:

Table 2-3-19 Major Regional Science and Technology Promotion Measures

Ministry	Item	Outline
Ministry of Internal Affairs And Communications	Strategic Information and Communications R&D Promotion Programme (Research and Development Promoting Info-Communications Technology for Community Development)	Joint research with SMEs, universities and other organizations which implements R&D in the telecommunication field that contribute to creation of new industries, development of local industries, vitalization of communities, etc. is promoted.
Science and Technology Policy Bureau, Ministry of Education, Culture, Sports, Science and Technology	Knowledge Cluster Initiative (1 st and 2 nd Stage)	13 clusters (15 regions) were selected nationwide to create internationally competitive knowledge-centered systems for technological innovation (Knowledge Clusters). Knowledge Clusters will be organized closely around the knowledge creation bases, which consist of universities or public research institutions. Other related public institutions and R&D firms are also expected to come into this program. Proper attention to the autonomy of local governments should be paid in the whole process.
	City Area Program	Through local independence, new technology seeds can be created by utilizing the “wisdom” contained in universities, achieving new industry creation and the development of R&D-type local industries. In addition, it is hoped to establish an independent and on-going industry-academia-government collaboration.
	Comprehensive Support Programs for Creation of Regional Innovation (JST project)	As a hub for JST Innovation Plazas and Innovation Satellite being developed throughout Japan, the collaboration between basic research and technology transfer projects in local governments, Bureaus of Economy, Trade and Industry, and JST is promoted to support creation of regional innovation comprehensively by continuous implementation of R&D toward stages from investigation of seeds to practical application. This program includes the “Science and Technology Incubation Program in Advanced Regions” and the “Collaboration of Regional Entities for the Advancement of Technological Excellence,” which aim to create regional innovation in such organic collaboration.
Forestry and Fisheries Research Council Secretariat, Ministry of Agriculture, Forestry and Fisheries	Practical Technology Development Program for the Promotion of New Agricultural, Forestry, and Fishery Policies [literal translation]	The development of technology for practical application is promoted by the proposal and public invitation method in order to promote policies for the development of agriculture, forestry, and fishery industry, regional revitalization and to solve various problems.
Ministry of Economy, Trade and Industry	Research and Development Program for Regional Innovation Creation [literal translation] Community Establishing Program for Regional Innovation Creation [literal translation]	The development of technology for practical application is implemented in agriculture, forestry, and fishery cooperation fields by industry-academia-government joint research entities by using the most advanced technology seeds in order to create new industries in the region. Research institutes and other organizations that undertake regional innovation establish one-stop support systems cooperatively to solve technological problems in leading small and medium sized regional enterprises and to solve equipment shortages, etc.
Environmental Policy Bureau, Ministry of the Environment	Research Funds for the National Organization for Pollution Prevention (Environment research to meet regional needs)	Implements joint research among national experimental research institutions, incorporated administrative research institutes and other public research institutions on research subjects where local needs are great and investigation into local environmental characteristics are required.
	Promotion funds for research and development and others (General strategy research adopted in a separate regional quota)	Implements research and development issues to utilize regional identity/characteristics for developing specific advanced environmental technology promotion and regional environmental business through promotion concentrating on regional research and development.
	Model Project for Establishment of Environmental Technology Development Infrastructure through Industry-Academia-Government in Regions	To promote infrastructure development of environmental technology development through Industry-Academia-Government in Regions, the following projects were implemented: (1) formation of network of environmental technology development personnel in regions; (2) settlement of regional environmental issues by utilizing regional resources through industry-academia-government collaboration and development of environmental technologies utilizing local industries; and (3) dissemination of the results throughout Japan.

1) MIC

Research and Development Promoting Info-Communications Technology for Community Development in the Strategic Information and Communications R&D Promotion Programme promotes joint research in the information and communications field between SMEs and universities engaged in R&D contributing to the creation of local-based new industries, the promotion of local industries or the reinvigoration of local communities.

2) MEXT

MEXT provides support for the creation of innovation in regions through JST's Comprehensive Support Programs for Creation of Regional Innovation, under careful support from S&T coordinators, etc., by using JST Innovation Plazas and Innovation Satellites (eight locations nationwide) as footholds for ensuring a consistent flow of R&D activities from the discovery of seeds to commercialization.

3) MAFF

By setting research types for regional revitalization and solutions against technical issues on production sites, etc. by utilizing regional free ideas in the Practical Technology Development Project for Promoting New Policy in Agriculture, Forestry and Fisheries [literal translation], MAFF promotes R&D activities through industry-academia-government collaboration mainly consisting of prefectural research and experiment institutes and regional universities. Moreover, for achieving contribution to development of agriculture, forestry and fisheries and to vitalize regional economy, nonprofit and other organizations are organized in respective regional areas, and the ministry promotes state-of-the-art technologies in the fields of agriculture, forestry, fisheries and food industries in regions through collaboration and cooperation with these organizations.

4) METI

Based on advanced technological seeds that can contribute to creating new regional industries, METI implements practical-application R&D in the agriculture-commerce-industry collaboration fields, etc. by industry-academia-government joint research entities. In addition, to solve technological problems and test instrument shortage problems of regional SMEs, the ministry established a one-stop support system in cooperation with research institutes and other organizations undertaking regional innovation.

AIST invited the researchers who belonged to public research and experiment organizations and understood the needs of regional SMEs (18 researchers invited in FY 2008), and cooperated with engineers of such enterprises when necessary to resolve technical problems faced by them in joint research programs.

5) MLIT

In order to facilitate collaboration between industry, academia and government in various R&D programs that will contribute to the enhancement of international competitiveness, the realization of a safe and secure society, and solution of environmental problems, and to further promote the utilization of research results, the Sixth Advanced Technology Forum for Land, Infrastructure, and Transportation [literal translation] was held in Sapporo in June 2008, with representatives of local industry, academia, and governments, as well as representatives of the ministry and relevant research institutions attending.

6) MOE

MOE implements the local environmental research, which carries out joint research with the national, independent administrative institutions' and public experimental research institutions. This focuses on research themes for which there is strong demand at the regional level, and which require study that matches the characteristics of the regional environment. In order to develop and disseminate advanced environmental technologies and promote regional environmental businesses by placing increased emphasis on R&D activities at the regional level, the ministry sets quotas for research themes (regional quotas) featuring local individuality and characteristics in strategic general research of the Environmental Research and Technology Development Fund. Furthermore, in model regions, the ministry implemented the model project for establishment of environmental technology development infrastructure through industry-academia-government collaboration in respective regions.

(Strengthening the activities and functions of public experimental research institutions as R&D and technology support organizations)

The relevant government ministries implement various measures directed at public experimental research institutions. These measures are summarized in Table 2-3-20.

Ministry	Outline
Ministry of Internal Affairs and Communications	Adopts local tax allocation measures for the research and development activity expenses of prefectural industrial technology centers, sanitation research institutes, agricultural test sites, livestock test sites, fishery test sites, and other public testing and research institutions.
Ministry of Agriculture, Forestry and Fisheries	Promotes research projects consigned to prefectural institutions, and implemented as part of national research <ul style="list-style-type: none"> - Breeding programs for major crops - Compliant researches and developments on priority issues
Ministry of the Environment	<ul style="list-style-type: none"> - Promotes joint research with the environment laboratory, etc., of local governments (prefectural or city governments), to contribute toward the preservation and improvement of the local environment - The National Environmental Research and Training Institute (NETI) offers training for national and local governmental officials, etc., toward the goal of acquiring environmental analysis technologies.

(Interregional collaboration and exchange)

The following measures are being implemented in order to encourage collaboration and exchange between the national government and local government authorities, as well as between different regions.

1) Research exchange and other programs of the Japan Association for the Advancement of Research Exchange Cooperation (JAREC)

JAREC was established in June 1992, based on funds provided by local government authorities, with the aim of supporting research exchanges and promoting regional research about S&T. This association implements various research support programs and nationwide research exchange programs for regions commencing cutting edge or basic research.

2) Industrial Technology Liaison Council [literal translation]

The Industrial Technology Liaison Council was established in 1954 in order to improve industrial technologies. At present, the Council is composed of six technology councils, eight regional councils, and eight regional industrial technology liaison councils [literal translation], in cooperation with public experimental research institutions, METI, and AIST, and it implements projects contributing to industry development and innovation creation in Japan through technology development support to companies, etc. and by undertaking projects for developing regional innovation creation community as well as by the effective promotion of research and experiments

(Consolidation of R&D bases)

The National Spatial Strategies¹ specifies the utilization of universities and experimental research institutions including the organizations concentrated in the Tsukuba Science City and the Kansai Science City for the purpose of contributing to nationwide development as they are important intellectual and human resources.

1) Tsukuba Science City

Tsukuba Science City was created to construct a center for high-level research, experiment, and education in Japan and to contribute to reducing the overcrowded status of Tokyo according to the Act on Construction of Tsukuba Science City (Act No. 73 of 1970). At present, 31 institutions, including national experimental research and education institutions, as well as many private-sector research institutions, are located in the city. They promote various measures such as research exchange advancement and establishment of international research exchange functions.

2) Kansai Science City

The Kansai Science City has been constructed as the center for contributing to the development of Japanese and world culture, science, and research and the development of the national economy according to the Construction Promotion Act for Kansai Science City (Act No. 72 of 1987). At the end of FY 2008, more than 110 facilities were established within the city, and are operating various research activities.

¹ National Spatial Strategies(National Plan) (Cabinet decision: July 4, 2008)

5 Effective and Efficient Implementation of R&D

(1) Effective use of research funds

(Elimination of waste in fund allocation)

Pursuant to the Guidelines for Management and Audit of Public Research Funds at Research Institutions (Implementation Standards)" (Minister of MEXT decision: February 15, 2007), MEXT called for submission of execution status reports on system improvement, based on the view that stronger management and supervision of research funds in research institutes are essential for preventing misuse of public research funds. In November 2008, the reports were submitted from about 1,600 institutions, and analysis thereof is now under way. In addition, to prevent misuse of public research funds, MEXT implements on-site inspections in order to better understand the present status of system improvement, etc. according to the guidelines, holds research conferences to promote understanding of the guideline purposes, and holds investigative commissions concerning management and audits of public research funds composed of external experts.

In addition, each funding agencies positively utilized the Information System for the Cross Cabinet and Ministry Research and Development: e-Rad (URL: <http://www.e-rad.go.jp/>), in order to eliminate unreasonable overlapping allocations and excessive concentration of funds.

As well, the Cabinet Office, with the support of ministries and agencies concerned, continued to collect data for the National R&D Database, which is utilized for macro analysis necessary for the formulation of Science and Technology Basic Plans and research and deliberations concerning fund allocations, by using the e-Rad.

(2) Emphasis on the development and utilization of human resources

Given that it is important to develop human resources through R&D activities, and that increased emphasis on R&D should be accompanied by increased emphasis on human resources, it is necessary to attach more importance to the development and utilization of human resources in the allocation of competitive research funds.

As a way to support young researchers, MEXT's Grants-in-Aid for Scientific Research program endeavors to expand its funds for young researchers. Measures continued from the previous year to support young researchers include MIC's Strategic Information and Communications R&D Promotion Programme, MHLW's Health and Labour Sciences Research Grants, MAFF's Basic Research Promotion Program for Creation of Innovation, METI's Grant for Industrial Technology Research, and MOE's Environmental Technology Development Fund.

(3) Reform of evaluation systems

In order to effectively and efficiently promote excellent R&D, such as, internationally high-level R&D, R&D that contributes to society and the economy, and R&D for the development of new science fields, it is important to improve the R&D evaluation system.

All ministries and agencies conduct R&D evaluation using national expenses, based on their own detailed guidelines specifying evaluation methodologies that have been formulated in accordance with the National Guideline on the Method of Evaluation for Government R&D



(Prime Minister decision). In order to appropriately deal with the increasing expectation to R&D in recent years, the national guidelines were revised on October 31, 2008; the revision specifies continuous leading of evaluation results to subsequent R&D and implementation according to international levels in spirit of creating excellent R&D results and feeding them back to society. Based on the revision, the ministries and agencies review the contents of the guidelines when necessary. MEXT, which accounts for more than 60% of the government's total S&T-related expenses, revised the Guideline for Evaluation of Research and Development in MEXT (Minister of MEXT decision) on February 17, 2009 by emphasizing on the following six points: (1) implementation of evaluations to discover and develop new research, and to prompt R&D activities for fostering human resources, (2) implementation of evaluations to encourage researchers who challenge creation, and to find, develop, and foster excellent R&D, (3) implementation of appropriate, effective evaluations to lead evaluation results to subsequent R&D, and to feed back results to society, (4) implementation of functional, efficient evaluations to avoid overly heavy evaluation workloads, (5) implementation of evaluations by introducing a global viewpoint, and (6) assurance of evaluation resources, and enhancement of evaluation support systems.

Meanwhile, independent administrative institutions and national universities conduct evaluation of their performance in accordance with the Act on General Rules of Incorporated Administrative Agency (Act No. 103 of 1999) and the National University Corporation Act (Act No. 112 of 2003), respectively. Ministries and agencies conduct policy evaluation in accordance with the Government Policy Evaluations Act (Act No. 86 of 2001).

SCJ implemented studies on approaches for research evaluation and proposed the approaches for research project evaluation and necessity of evaluation by third parties in its external report *Present Status of Research Evaluations and its Future in Japan* on February 26, 2008.

6 Elimination of Institutional and Operational Bottlenecks for Smoother S&T-related Activities and Dissemination of Research Results

When promoting S&T, it is an important key to develop a institutional environment that facilitate active personnel exchanges, smoother implementation of research activities and dissemination of research results to society for increasing the effects of the investment of human/physical resources in S&T. To solve the problems prevalent in the research field such as systematic obstacles to the advancement of S&T and the benefits of research results to society, CSTP compiles 66 reform topics across seven items below. The Council conducted follow-ups on respective items in FY 2008 and reported the results on May 19, 2008.

1. System to attract talented foreign researchers to Japan
2. Environment to improve the mobility of researchers
3. Achieving effective and fair use of research funds
4. Boosting research support
5. Improving environment to promote the activities of female researchers
6. Comprehensive support for clinical research including trials
7. Improving the public's understanding of science