

# NATIONAL SCIENCE FOUNDATION

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### Report Memorandum #10-01

#### Japanese Government S&T Budget Proposal for JFY2010

*An exchange rate of ¥100/\$ is used in this report.*

*For further questions about the report, contact*

*Ms. Kazuko Shinohara at [nsftokyo@nsf.gov](mailto:nsftokyo@nsf.gov)*

The Ministry of Finance (MOF) has finalized the budget proposal for JFY2010 (April 2010-March 2011) and submitted it to the Diet at the end of December 2009. It is under discussion at the present Diet session that started on January 18, 2010, and will be voted on before the end of March 2010. The Council for Science and Technology Policy (CSTP) has made public a compilation of the science and technology-related budget items within the proposed budget. This report summarizes the CSTP report.

#### **S&T budget proposal for JFY2010:**

The S&T budget proposal for JFY2010 was ¥3,572.3 billion (\$35.7 billion), an increase of 0.8

percent from the JFY2009 budget of ¥3,544.4 billion (\$35.4 billion). When the JFY2010 S&T budget proposal is combined with the JFY2009 S&T second supplemental budget proposal, it is ¥3,724.5 billion (\$37.2 billion), an increase of 5.1 percent from the JFY2009 budget allocation. The Japanese government often combines a fiscal year budget with the previous year's second supplemental budget, as the latter is, in most cases, decided at the end of a fiscal year and actually expended in the next fiscal year. When the proposal is viewed by ministry/agency, the Ministry of Education, Science and Technology (MEXT) takes 65 percent of the S&T budget, followed by the Ministry of Economy, Trade, and Industry's (METI) 15.1 percent. These proportions remain the same as in the previous years. Table 1 below shows the overall proposed S&T budget; and Table 2 shows the proposed S&T budget by ministry/agency.

**New budget-making procedure:**

The new administration, launched in the middle of September, requested all the ministries and agencies to resubmit the budget requests by October 15, 2009, by ignoring the requests they had already made by a deadline of August 31, 2009 under the previous administration. The new administration's budget guidelines did not include the ceiling amount (a maximum amount allowed for each ministry/agency to request) as has been the case in the previous years, but asked the resubmitted budgets to eliminate as much waste as possible (Refer to <http://www.nsftokyo.org/rm09-06.pdf>).

In November, a new organization, Government Revitalization Unit (GRU), reviewed 447 programs/projects in the ministry/agency budget requests, including S&T areas, to eliminate wasteful spending. The GRU's recommendations to cut budgets from various S&T programs/projects elicited strong reactions from the research community. As the S&T budgets have long been protected in a 'sacred' area with the objective of establishing an S&T-oriented nation, obtaining budgets for S&T activities has not required extra efforts by the research community. The unprecedented GRU review process made the S&T communities realize that it will be essential in the future to raise the public understanding of the value of research (Refer to <http://www.nsftokyo.org/rm09-07.pdf>).

In parallel to the GRU's review, the CSTP conducted its customary review of the S&T budget in November 2009. Differing from the previous years, CSTP posted the review result on the WEB and invited comments from the public. The CSTP's final decision was slightly modified,

reflecting the public comments.

After GRU's and CSTP's review, negotiations between MOF and ministries/agencies took place and the final budget proposal was announced on December 25, 2009.

Tables 3 and 4 below summarize the amounts for JFY2009 budget, JFY2010 budget request, and JFY2010 budget proposal; and also the CSTP's ratings of S, A, B, and C for new programs/projects, and the priority levels for continuing programs/projects (Refer to <http://www.nsftokyo.org/rm09-08.pdf>).

**JFY2010 budget highlights:**

The government places top priority on 'Green Innovation,' as illustrated by a big increase in METI's programs such as: the New energy technology R&D program (solar, wind, new energy venture) from the requested ¥4,285 million (\$42.9 million) to the proposed ¥6,087 million (\$60.9 million); and Practical application of CO2 emission mitigation from ¥2,260 million (\$22.6 million) in JFY2009 to ¥5,900 million (\$59 million). New programs to support 'Green Innovation' are also added, including: MEXT's Strategic initiative for climate change program at ¥1,618 million (\$16.2 million); MEXT/JST's Advanced low-carbon technology program at ¥2,500 million (\$25 million); and METI/NEDO's Comprehensive energy storage systems program at ¥4,343 million (\$43.4 million).

Government investments in large facilities such as ALMA (Atacama large Millimeter/Submillimeter Array), J-PARC (Japan Proton Accelerator Research Complex), RI (Radioactive Isotope) Beam Factory, and Spring-8 (3<sup>rd</sup>-generation synchrotron radiation facility) have remained about the same as the previous year's budget. Of the S-rated competitive funds, the budget for WPI (World Premier International) program has slightly increased from ¥7,109 million (\$71.1 million) to ¥7,283 million (\$72.83 million), while the budget for the Global COE (Center of Excellence) program has decreased to ¥26,474 million (\$264.7 million) from the previous year's ¥34,228 million (\$342.3 million). This decrease may reflect the GRU's review result (Refer to <http://www.nsftokyo.org/rm09-08.pdf>) that recommended an overhaul of the competitive funding system to eliminate unnecessary duplication of efforts among the various funding programs.

The three continuing programs for stimulating regional S&T activities requested by MEXT are zeroed out in the JFY2010 budget. This also reflects the GRU's recommendation that regional S&T programs should be supported by local governments.

Of the programs not rated by CSTP, the Grants-in-Aid for Scientific Research (Kakenhi: unsolicited grants for basic research) has increased to ¥200,000 million (\$2 billion) from ¥196,998 (\$1.97 billion) in JFY2009; on the other hand, the Coordination Fund for Promoting S&T (basic research fund granted to support the fiscal year's highest priority activities) has decreased to ¥29,643 million (\$296.4 million) from the previous year's budget of ¥36,340 million (\$363.4 million). The budget for renovating the university facilities has increased to ¥54,516 million (\$545.2 million) from ¥48,320 million (\$483.2 million) in JFY2009.

**Next phase:**

It has been a custom in Japan that the MOF's budget proposal undergoes only negligible modifications in the Diet unlike the U.S. system. It is to be seen if the tradition continues under the Hatoyama administration.

GRU is moving to review the whole operation of the independent administrative organizations, including the Japan Science and Technology Agency (JST) and the Japan Society for the Promotion of Science (JSPS), both typical funding agencies in S&T fields. The fact that the GRU review results were reflected in the proposed JFY2010 budget has taught researchers and government S&T officials a lesson that they cannot afford to be complacent and must play an active role in the budget making process. At the same time, the Hatoyama administration will use the lessons learned from the first cycle of budget making as they begin developing the JFY2011 budget.

The Hatoyama administration has not made its vision of science and technology clear. It is expected that the fourth science and technology basic plan (strategies from JFY2011-2015) being drafted by CSTP will articulate the vision. NSF Tokyo Office will report on the draft plan as soon as it is made public.

**Table 1. JFY2010 S&T-related Budget Proposal (¥ Billion)**

	JFY2009 budget (A)	JFY2010 budget (B)	Increase/ Decrease (B)/(A)(%)	JFY2010 2nd Supplemental Budget Proposal(S)	(B)+(S)	(B)+(S)/(A) (%)
S&T-related budget	3,544.4	3,572.3	0.8	1,52.1	3,724.5	5.1

**Table 2. JFY2010 S&T-related Budget Proposal by Ministry/Agency (¥ Billion)**

Ministry/agency	JFY2009 S&T Budget (A)	JFY2010 S&T Budget Proposal (B)	JFY2010 2nd Supplemental Budget Proposal (S)	(B)+(S)
Ministry of Education, Culture, Sports, S&T	2,341.3	2,323.6	30.1	2,353.6
Ministry of Economy, Trade and Industry	531.6	538.9	17.3	556.2
Defense Agency	131.7	171.4	0.0	171.4
Ministry of Health, Labour, and Welfare	135.1	154.1	95.0	249.1
Ministry of Agriculture, Forests, and Fisheries	135.0	123.8	0.8	124.6
Ministry of Internal Affairs and Communications	70.9	61.0	9.0	70.0
Cabinet Secretariat	64.3	63.6	0.0	63.6
Ministry of Land, Infrastructure, and Transportation	57.5	55.1	0.0	55.1
Ministry of Environment	35.0	38.0	0.0	38.0
Cabinet Office	18.0	19.9	0.0	19.9
Ministry of Foreign Affairs	12.6	11.8	0.0	11.8
Ministry of Justice	6.3	6.4	0.0	6.4
Police Agency	2.4	2.4	0.0	2.4
Ministry of Finance	1.5	1.4	0.0	1.4
Diet	1.1	1.1	0.0	1.1
<b>TOTAL:</b>	<b>3,544.4</b>	<b>3,572.3</b>	<b>152.1</b>	<b>3,724.5</b>

**Table 3. S&T-related budget for new programs/projects for JFY2010**

Rating	Program/Project	Agency/ Res. Inst.	JFY2010	JFY2010
	NOTES: Red letters: Competitive funds		Budget	Budget
			Request	Proposal
(¥Mil.)				
<b>Life Science</b>				
S	Infectious diseases: International network	MEXT	2,100	1,900
S	Early stage cancer diagnosis/treatment	METI	1,512	1,220
S	National survey for children's health and environment	MOE	3,403	3,140
A	Molecular imaging	MEXT	700	530
A	Development of new processes for value added domestic animal products	MAFF	706	545
A	Efficient and sustainable uses of rice paddies	MAFF	805	604
A	Practical uses of agro-health	MAFF	708	551
A	Development of new technologies in gene regulation	MAFF	400	320
B	Epigenome-based pharmaceutical R&D	METI	400	320
B	Next-generation technology in substitution of molecular functions	METI	560	473
B	Increasing labor efficiencies through farm automation	MAFF	616	348
<b>Information Technology</b>				
S	High-speed processing/energy-saving network node	MIC	561	0
S	Ultra-high-speed edge node	MIC	630	630
S	Ultra low-voltage device for a low carbon society	METI	2,120	2,046
A	Highly reliable/energy-saving network for cloud computing	MIC	980	980
A	Improved communications through fiber optics	MIC	510	510
A	High-speed non-volatile memory	METI/NEDO	490	327

A	Information security for a large-scale virtual server	MIC	522	522
A	Highly reliable and energy -saving next-generation IT	METI	1,253	860
A	Next-generation supercomputer	MEXT	750	300
B	Environmentally friendly home network	MIC	350	0
B	IT infrastructure for medium and small businesses	METI	1,100	733
<b>Environment</b>				
S	Global warming mitigation and adaptation in agriculture, forestry and fisheries	MAFF	767	675
A	Building a network for monitoring and assessing climate change	MOE	139	139
A	Behavioral science of low carbon society development	MEXT/JST	300	300
A	Strategic initiative for climate change	MEXT	2,440	1,618
A	Prevention of nano materials' potential negative effects on the environment	MOE	30	19
A	Biomass engineering	MEXT/RIKEN	560	560
B	CO2 reduction in automobile transport	MLIT	20	19
B	Agrochemical's impact on the atmosphere	MOE	154	80
C	Industry-led technology development	MAFF	3,000	1,700
<b>Nanotechnology/Materials</b>				
S	Power semi-conductor for low carbon society	METI	2,000	2,000
A	Super-light and super-strong materials for a low carbon society	METI	1,500	1,500
B	New green materials for the future	MEXT/RIKEN	550	440
<b>Energy</b>				
S	International nuclear power-related personnel training initiative	MEXT	557	356
S	New energy technology (next-generation technologies on solar power)	METI/NEDO	4,411	4,077

S	Advanced low-carbon technologies	MEXT/JST	3,500	2,500
S	Advancement of CO2 capturing technology (US-J cooperative research)	METI	180	180
S	Comprehensive energy storage systems	METI/NEDO	6,430	4,343
S	Next-generation heat pump system	METI/NEDO	400	400
A	Nuclear safety research	CAO	181	111
A	Strategic and advanced use of nuclear power	METI	1,630	1,630
A	Polymer electrolyte fuel cells	METI/NEDO	5,100	5,100
A	Modeling CO2 emission patterns (US-Japan Cooperative Research)	METI	400	400
A	Clean coal technology: innovative coal gasification system	METI/NEDO	1,500	1,500
A	Materials for the next-generation batteries	METI/NEDO	200	133
B	Re-processing of spent plutonium fuel	METI	20	20
B	Innovative cement manufacturing process	METI/NEDO	210	140
C	Advanced oil refinery technology	METI	100	0
<b>Monozukuri (Manufacturing)</b>				
S	High-output multi-beam complex laser processing system	METI/NEDO	890	700
<b>Social Infrastructure</b>				
S	Haplotype analysis in screening of individuals	PA	45	45
S	Technologies to ensure the safety and security of public infrastructure	MLIT	80	72
S	Evaluation of anti-seismic buildings in accordance with the latest seismological information	MLIT	20	18
A	Research on interviewing techniques in criminal cases	PA	18	18
<b>Frontier (Space and Ocean)</b>				
S	Ultra-small satellites	MEXT	1,000	300
B	Coordination for promoting use of space with the Quasi-zenith satellite	MEXT	650	0

Universities				
B	Strengthening of R&D with Postdoc's participation	MEXT	953	0
Competitive funds				
C	Strengthening of Strategic Basic Research	MEXT	2,000	0
Intellectual Property/Local S&T/Industry-university-Government Cooperation				
A	Promotion of innovation through the increased industry-university cooperation	MEXT/JST	1,373	1,273
A	Improving R&D capacity of small /medium businesses	METI	900	900
B	Regional industry-university-government cooperation	MAFF	300	200
B	Technology development for local community development	MAFF	1,955	0
B	Building innovation clusters through industry-university-government cooperation	MEXT	1,500	0
Human Resource Development for Science and Technology				
B	Training of the next-generation of workers in frontier technologies at small- and medium-sized companies	METI	450	372
B	Training for R&D managers	MEXT	200	102
C	Training of advanced industrial personnel in Asia	MEXT	1,000	0
Science Diplomacy				
S	Improvement of the institutional environment for foreign researchers	MEXT	200	0
S	US-Japan cooperation on energy and environment technology research and standardization	METI	400	400
B	International research networks for global-scale issues	MAFF	116	66

**Table 4. S&T-related budget for continuing programs/projects for JFY2010**

Program/Project	Ministry/ Agency/ Res. Inst.	JFY2009 Budget (¥ Mil)	JFY2010 Budget Request (¥ Mil)	JFY2010 Budget Proposal (¥ Mil)
<b>NOTES: RED letters: Competitive funds</b>				
	To be accelerated			
	To be renewed			
	To be decelerated			
<b>Life Science</b>				
Comprehensive database project: bioinformatics	MEXT/JST	1,841	1,771	1,756
Comprehensive genomic information for organisms relevant to agriculture, forestry, and fisheries	MAFF	700	645	639
Bioresource program	MEXT/RIKEN	1,590	1,578	1,534
Translational research promotion	MEXT	2,400	2,400	2,398
Risk analyses of food and drug (those items not included in the "Return to the Society")	MHLW	Part of 611	Part of 678	Part of 649
Comprehensive research on infectious diseases	MHLW	6,227	6,920	6,613
Comprehensive research on practical use of medical technologies	MHLW	6,182	6,088	6,014
Translational research from basic to clinical	METI	3,300	2,550	2,550
Biological basic research to accelerate genome-enabled pharmaceuticals	METI	2,800	1,570	1,570
Industrial application of stem cell technologies	METI	1,000	900	900
Environment-friendly manufacturing technology utilizing microorganisms	METI	545	500	500
National bioresource project	MEXT	1,368	1,368	1,338
Innovative research on protein/cell analysis	MEXT	5,800	5,600	5,170
Strategic promotion of brain research	MEXT	2,300	2,400	2,390
Comprehensive brain research program	MEXT/RIKEN	3,937	3,573	3,492
Comprehensive research on immunology/allergy	MEXT/RIKEN	1,238	1,141	1,105
Comprehensive research on developmental/regenerative science	MEXT/RIKEN	1,545	1,413	1,356

Basic Omics research	MEXT/RIKEN	950	942	931
Personalized medicine	MEXT	2,718	2,027	2,027
Genome-based medical science program	MEXT/RIKEN	841	845	814
Molecular imaging	MEXT/NIRS	1,516	1,516	1,516
Heavy ion cancer treatment	MEXT/NIRS	5,330	5,578	5,578
Comprehensive research on lifestyle-related diseases/rare diseases: cardiovascular diseases/diabetes, kidney diseases, immune/allergy	MHLW	3,628	3,670	3,109
Comprehensive research on lifestyle-related diseases/rare diseases: rare diseases	MHLW	10,000	7,550	10,000
Frontier basic research: pharmaceuticals	MHLW	3,957	4,251	3,700
Frontier basic research: medical equipment development, excluding those in nanotechnology field	MHLW	Part of 2,969	Part of 3,172	Part of 2,857
Comprehensive research on longevity and the disabled	MHLW	Part of 3,288	Part of 3,682	Part of 3,108
Basic research on medical science	MHLW/NIBIO	8,162	6,502	6,489
Third comprehensive research on cancer	MHLW	5,835	6,170	5,806
Glyco-engineering project	METI	950	730	730
Risk analyses of food and drug: food safety and security	MHLW	1,531	1,684	1,486
Efficient risk management of bird flu and BSE (mad cow disease)	MAFF	691	637	587
Genome projects for new business opportunities in agriculture	MAFF	3,965	3,656	3,277
Experiments on MAFF designated topics	MAFF	924	924	855
Basic research to create innovation	MAFF	6,800	6,469	5,994
Advanced <i>in planta</i> manufacturing technologies	METI	1,040	1,040	1,040
<b>Information Technology</b>				
Photonic network	MIC/NICT	3,602	3,749	3,733
Green IT	METI/NEDO	5,000	4,000	4,000
Ubiquitous network robots for the aged and disabled	MIC	550	739	739
Next-generation intelligent robots	METI/NEDO	1,350	910	910

Universal voice/language communication	MIC/NICT	1,455	1,543	1,523
Next-generation network	MIC/NICT	2,617	2,602	2,537
New-generation network	MIC/NICT	2,003	1,756	1,756
Element technologies for advanced use of frequency in mobile communications	MIC	3,578	Part of 8,816	3,683
Shift of wireless system into unused bandwidth	MIC	1,821	Part of 8,816	1,922
Mobile phone system for dual terrestrial and satellite uses	MIC	558	Part of 8,816	760
MIRAI (Millennium Research for Advanced Information Technology)	METI/NEDO	4,100	2,850	2,850
Ubiquitous platform	MIC	1,276	1,032	1,032
Dream chips	METI/NEDO	1,200	900	900
Next-generation process-friendly design	METI/NEDO	690	578	578
Next-generation large-scale energy-efficient display	METI/NEDO	445	520	520
Network security	MIC/NICT	1,021	750	750
Countermeasures for cyber attacks	MIC	596	547	547
Computer security early warning system	METI	1,214	971	971
Corporate/individual information security	METI	757	702	702
Information security	METI/IPA	1,195	1,159	1,159
Promotion of use of open software	METI/IPA	540	540	540
System engineering implementing center	METI/IPA	845	849	854
Innovative three-dimensional imaging	MIC/NICT	1,139	1,133	1,108
New market creation through integration of IT with service	METI	1,500	800	798
Strategic information communication	MIC	2,179	1,806	1,787
Training of advanced IT specialists	MEXT	895	540	340
ICT innovation to solve global warming	MIC	390	572	566
Basic technology research in the industry sector	MIC	2,600	1,500	1,400
<b>Environment</b>				
21st century climate change prediction program	MEXT	1,540	1,640	1,540
Non-Freon based energy-saving air cooling system	METI	810	770	770

Network for monitoring and assessing impacts of climate change	MOE	237	197	197
GOSAT: Global environment observation by satellite	MOE/NIES	631	696	696
Efficient and environment-friendly water circulation system	METI/NEDO	1,172	1,400	1,400
Modeling of global environment change predictions	MEXT/JAMSTEC	1,309	1,305	1,305
Climate change simulation from the regional to global	MEXT/JAMSTEC	1,032	1,026	982
Comprehensive research on environment research	MOE	5,115	5,420	5,269
Observation of water/heat/matter circulations at all levels	MEXT/JAMSTEC	602	600	600
Survey/analyses/evaluation of ecosystems and biodiversity of rivers	MLIT	17	Not specified	Not specified
Risk analyses on foods/pharmaceuticals: chemical substances	MHLW	1,118	1,237	1,084
Building a recycle-minded society	MOE	1,803	1,738	1,738
<b>Nanotechnology/Materials</b>				
Strategies for elements	MEXT	651	520	520
Alternative rare materials	METI/NEDO	1,550	1,240	1,240
Nanotechnology network	MEXT	1,305	1,528	1,328
Nanotech challenge across disciplines and industries	METI/NEDO	3,600	2,592	2,592
Nanoelectronics semiconductor: new materials and new structure for nanoelectronic devices	METI/NEDO	600	500	500
Next-generation super-strong and heat-resistant steel	MEXT/NIMS	370	582	545
Efficient and low-cost next-generation solar battery	MEXT/NIMS	250	698	673
New-century heat-resistant materials	MEXT/NIMS	306	541	510
Sustainable hyper composite technology	METI/NEDO	643	600	600
Minimally invasive and noninvasive medical equipment (those not in Life Science)	MHLW	1,730	Part of 2,322	Part of 2,105
Advanced optics	MEXT/RIKEN	875	832	832
Basic technology development to form optical/quantum research centers	MEXT	1,721	1,621	1,520

Energy				
ITER	MEXT	11,088	10,000	9,906
Nuclear power strategic research initiative	MEXT	810	1,050	997
New Energy technology R&D (Solar, wind, new energy venture)	METI/NEDO	4,320	4,285	6,087
Hydrogen production/transport/storage system	METI/NEDO	1,360	1,350	1,350
Hydrogen storage materials: frontier basic research	METI/NEDO	1,000	900	900
Innovative fuel cells: frontier science basic research	METI/NEDO	3,000	3,000	3,000
Environment-friendly steelmaking process	METI/NEDO	1,120	1,000	1,960
Nuclear power system R&D	MEXT	5,769	5,555	4,144
High-level radioactive waste processing	MEXT/JAEA	8,734	8,302	7,909
Innovative hydrogen manufacturing system	MEXT/JAEA	100	550	550
Underground radioactive processing	MEXT	3,652	2,949	2,949
Full MOX fuel nuclear reactor facilities	METI	3,000	2,400	2,376
Next-generation light water reactor	METI	1,940	1,940	1,940
Advanced reprocessing of spent nuclear fuel	METI	1,596	1,796	1,796
SOFC (Solid Oxide Fuel Cell) system: element technology	METI/NEDO	1,200	800	800
SOFC (Solid Oxide Fuel Cell) : practical application	METI/NEDO	720	800	662
Fuel cells: practical application	METI/NEDO	988	900	870
Hydrogen: frontier science basic research	METI/NEDO	1,125	1,000	1,000
CO2 storage and sequestration	METI	580	580	580
Innovative next-generation oil-refining technology	METI	4,162	3,376	3,376
GTL (gas to liquid) technologies for natural gas	METI/JOGMEC	3,802	2,500	2,500
Advanced Ultra Super Critical (A-USC) : element technology	METI	743	743	743
Development of methane hydrate	METI	4,526	3,244	4,543
Practical application of highly efficient gas turbine	METI	1,645	2,500	3,081
Practical application of CO2 emission mitigation technologies	METI	2,260	5,900	5,900
Next-generation environment-friendly oil	METI	905	750	750

Superconducting power apparatus with Yttrium	METI/NEDO	3,000	2,916	2,916
Strategic technology development for commercializing next-generation power storage system	METI/NEDO	4,310	3,280	3,280
<b>Energy-saving innovative technology development</b>	METI/NEDO	7,000	7,000	7,000
Decontamination of uranium generation by the fast reactor reprocessing	METI	540	513	293
<b>Monozukuri (Manufacturing)</b>				
Advancement of strategic basic technologies	METI	5,400	4,000	15,005
Advanced measurement/analyses technologies	MEXT/JST	6,300	5,501	4,951
Photocatalysis industry for a recycle-minded society	METI/NEDO	839	669	669
Basic technology for sustainable, green chemical processing	METI/NEDO	1,500	1,080	1,080
Interdisciplinary technology for manufacturing the next-generation device	METI/NEDO	1,150	802	802
Simulation software for creating innovation	MEXT	510	520	520
<b>Social Infrastructure</b>				
All weather/high density space flight technology	MEXT/JAXA	546	619	619
Development of carbon fiber complex materials	METI	5,207	1,462	1,462
Safe and Secure S&T	MEXT	538	501	421
Comprehensive research on active faults	MEXT	660	620	588
Analysis of the relationships between earthquakes originating in Tokai, East Nankai, and Nankai areas (middle of Japan)	MEXT	501	501	501
Focused study/observation/research on geological stresses caused by earthquakes	MEXT	596	596	594
Special project for prevention/mitigation of urban-area large-scale earthquakes	MEXT	809	755	755
Seismic experiments using the 3-dimensional shake table facilities	MEXT/NIED	1,412	1,712	1,673
Increased monitoring/modeling of the crust changes to mitigate disasters caused by earthquakes and volcanic eruptions	MLIT	983	798	797

Domestic airplane: highly functional technology/clean engine technology R&D	MEXT/JAXA	2,166	1,731	1,731
Environment-friendly engine for small airplanes	METI/NEDO	600	534	534
Advanced aero dynamics design	METI	4,100	3,330	3,330
Marine environment initiative: R&D on highly efficient vessels; comprehensive policy for promoting international standards	MLIT	844	841	817
<b>Frontier (Space and Ocean)</b>				
the Japanese module "Kibo", an integral part of the International Space Station	MEXT/JAXA	15,371	15,437	15,310
BepiColombo (Mercury magnetic orbiter and Mercury planetary orbiter)	MEXT/JAXA	2,010	2,010	1,810
Frontier space system through miniaturization	METI/NEDO	1,637	2,275	2,246
Development of basic tools to make use of marine resources:	MEXT	700	700	700
Quasi-zenith satellite system	MIC	1,529	1,063	1,063
Coordination for promoting use of space (excluding the use of the Quasi-zenith satellite)	MEXT	300	850	492
Space-based solar power generation	MEXT/JAXA	271	500	350
International cooperation experiment, using "Kizuna," supersonic internet satellite	MEXT/JAXA	1,264	1,310	1,310
Next-generation earth observation sensor research (high-quality hyper spectrum sensor)	METI/NEDO	2,996	2,400	2,400
Oil resource remote detection technology	METI	1,477	1,188	1,188
<b>Basic Research</b>				
ALMA (Atacama Large Millimeter/sub millimeter Array)	MEXT/NINS	4,305	4,242	4,242
J-PARC (Japan Proton Accelerator Research Complex)	MEXT/JAEA/ KEK	14,760	15,320	14,148
RI Beam Factory	MEXT/RIKEN	3,216	3,480	3,480
Spring-8	MEXT/RIKEN	9,226	9,259	9,054
<b>Competitive funds</b>				
Global COE (Center of Excellence) program	MEXT	34,228	34,136	26,474

WPI (World Premier International) program	MEXT	7,109	9,312	7,283
<b>Intellectual Property/Industry-University-government/Regional Revitalization</b>				
Industrial standardization/Intellectual infrastructure	METI/NEDO	2,117	2,582	2,536
Strategic deployment of Industry-University-Government programs	MEXT	2,967	2,881	0
Technology transfer support center	MEXT/JST	2,557	2,357	2,238
Promotion of technology transfers	MEXT/JST	10,078	9,674	16,580
Sharing of advanced research facilities	MEXT	1,691	1,498	1,398
Industrial technology research grants	METI	4,445	3,092	3,092
Regional Innovation promotion	METI	6,508	3,440	3,440
Comprehensive support for regional innovation	MEXT/JST	11,593	10,923	0
Urban-area industry-university-government cooperation	MEXT	4,500	3,500	0
Intelligent cluster creation	MEXT	8,930	7,942	0
New technologies in support of new MAFF policy goals	MAFF	6,516	5,215	6,183
Testbed network for frontier research	MIC/NICT	3,881	3,842	3,750
Okinawa Institute of Science and Technology	CAO/OIST	11,229	14,912	13,309
<b>Human Resource Development for Science and Technology</b>				
Organizational graduate education reform	MEXT	5,746	2,418	2,203
Doctoral/postdoctoral Fellowship program	MEXT	16,314	17,042	16,740
Facilities/equipment for science education	MEXT	2,000	2,000	1,100
Industry-university partnership in training the future workforce	METI	1,511	1,137	1,066
Centers for science teacher training	MEXT	340	647	482
<b>Science Diplomacy</b>				
Science and technology cooperation on global issues	MOFA/JICA	3,284	3,340	3,320
Science and technology research partnership for sustainable development	MEXT	1,154	2,127	1,807
Postdoctoral fellowship for research abroad	MEXT	1,602	1,599	1,599
Research Cooperation programs	METI	872	600	600
S&T diplomacy experts exchange	MOFA	2	2	2
Strategic International S&T Cooperation	MEXT	1,568	1,645	1,583
Network for inviting foreign researchers	MEXT	5,353	4,982	4,632

International opportunities for Japanese young researchers	MEXT	740	690	690
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## Appendix

Abbreviation	Full Name
CAO	Cabinet Office
IPA	Information-technology Promotion Agency
JAEA	Japan Atomic Energy Agency
JAMSTEC	Japan Agency for Marine-Earth Science and Technology
JAXA	Japan Aerospace Exploration Agency
JICA	Japan International Cooperation Agency
JOGMEC	Japan Oil, Gas and Metals National Corporation
JSPS	Japan Society for the Promotion of Science
JST	Japan Science and Technology Agency
KEK	High-energy Accelerator Research Organization
MAFF	Ministry of Agriculture, Forestry and Fisheries
METI	Ministry of Economy, Trade, and Industry
MEXT	Ministry of Education, Culture, Sports, Science and Technology
MHLW	Ministry of Health, Labor, and Welfare
MIC	Ministry of Internal Affairs and Communications
MLIT	Ministry of Land, Infrastructure, and Transportation
MOE	Ministry of Environment
MOFA	Ministry of Foreign Affairs
NEDO	New Energy and Industrial Technology Development Organization
NIBIO	National Institute of Biomedical Innovation
NICT	National Institute of Information and Communication Technology
NIED	National Research Institute for Earth Science and Disaster Prevention
NIES	National Institute for Environmental Studies
NIMS	National Institute of Materials Sciences
NIRS	National Institute of Radiological Sciences
OIST	Okinawa Institute of Science and Technology
PA	Police Agency
RIKEN	Institute of Physical and Chemical Research