

A note on the Japanese science and technology related supplemental budget for FY 1998 / British Embassy, Tokyo.

Contributors

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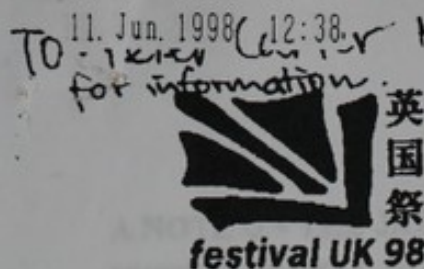
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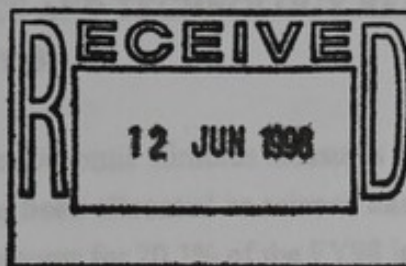
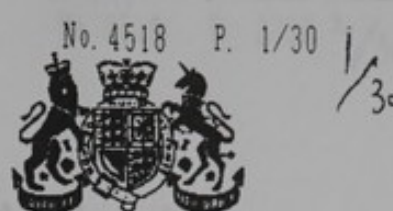


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Dear Judith

Attached for GIST

House of Lords PQ on Japan's S&T budget

In response to your request for details of Japan's '98 S&T budget, comprehensive breakdowns follow of the initial and supplementary budgets. The initial budget only increased slightly over the 97 budget, falling short of what was necessary to achieve the Basic S&T's Plan's target of doubling the budget in five years. The small increase was nevertheless an indication that in these years of financial constraint, S&T was still being given priority. However, nothing is static in Japan and in the light of continuing economic stagnation, the Government introduced a supplementary budget in an effort to ward off recession. As a result, S&T expenditures will increase by a whopping 21%, with most projects benefiting.

How this increase will impact on growth, innovation and jobs?

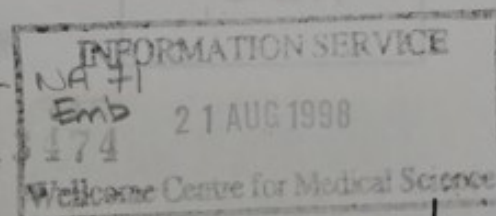
In the short term, money spent on the construction of facilities and the purchases of scientific instruments will boost orders and go some way to address unemployment, which is at a peak of 4.1%. There will be more post-doc awards and the target of ten thousand a year will be reached earlier. With regard to innovation, the numerous cutting edge technology projects will get a further boost, but the innovation record of public sector R&D investment is modest and I doubt if the situation will change in the near term, if at all. Innovation and job creation are dependent on the quality of the research and the institutional infrastructure for exploitation. Currently the latter is not conducive to effective technology transfer and although the situation is being addressed, the culture will have to change substantially before the Japan gets a real return from its public R&D investment.

I hope this response meets the need. Please copy us the answer to the PQ.

Yours Sincerely

Dr A R Cox
Counsellor, Science and Technology

cc: D Lyscom, ESED FCO (+44 171 270 4077)



Science and state - Japan.

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A NOTE ON THE JAPANESE SCIENCE AND TECHNOLOGY RELATED SUPPLEMENTAL BUDGET FOR FY1998

1. Out of 16 trillion yen's comprehensive economic stimulus measures implemented in April 1998, **616.8 billion yen (B¥)** has been allocated as science and technology related supplemental budget. It accounts for 20.3% of the FY98 initial budget (3,031.9B¥). The combined total of 3,648.7 billion yen for FY1998 science and technology budget makes a **21.5% increase** over the initial budget of FY1997 (3,002.6B¥). This is a positive step toward the realisation of the goal of doubling the government S&T expenditure by 2000 from the FY1992 level.
2. The below table shows the changes of S&T budgets, including supplemental budget for the past several years.

FY	Initial budget	supplemental budget	total S&T budgets	changes
FY1992	2,134.7	103.7	2,238.4	+10.7%
FY1993	2,266.3	549.0	2,815.3	+25.8%
FY1994	2,358.5	9.7	2,368.2	-15.9%
*FY1995	2,499.6	685.4	3,185.0	+34.5%
**FY1996	2,810.5	155.5	2,966.0	-6.9%
FY1997	3,002.6	0	3,002.6	+1.2%
FY1998	3,031.9	616.8	3,648.7	+21.5%

**FY95: the year to launch 10,000 post-doc plan and supplemental budget were allocated to implement competitive R&D schemes by ministries*

***FY96: The S&T Basic Plan passed the Diet in July 1996, which plans to spend ¥17 trillion in the next five years (1996-2000)*

3. FY1998 S&T Supplemental Budget of major ministries are:-

Monbusho	188.7
MITI	180.4
Science and Technology Agency (SAT)	111.8
Ministry of Posts and Telecommunications	102.5
Others	33.4
Total	<u>616.8B¥</u>

A NOTE ON THE JAPANESE SCIENCE AND TECHNOLOGY RELATED SUPPLEMENTAL BUDGET FOR FY1998

- One of 16 trillion yen's comprehensive economic stimulus measures implemented in April 1998, 616.2 billion yen (8%) has been allocated as science and technology related supplemental budget. It accounts for 30.3% of the FY98 initial budget (2,031.98B). The combined total of 1,645.7 billion yen for FY1998 science and technology budget makes a 31.2% increase over the initial budget of FY1997 (1,252.68B). This is a positive step toward the realization of the goal of doubling the Government S&T expenditure by 2000 from the FY1992 level.
- The below table shows the changes of S&T budget, including supplemental budget for the past several years.

FY	initial budget	supplemental budget	total S&T budget	change
FY1992	2,134.7	103.7	2,238.4	+10.7%
FY1993	2,366.2	246.8	2,613.0	+22.6%
FY1994	2,333.2	9.3	2,342.5	-12.9%
*FY1995	2,669.8	68.4	2,738.2	+14.3%
**FY1996	2,819.2	122.2	2,941.4	+6.9%
FY1997	2,002.6	0	2,002.6	-1.3%
FY1998	2,611.9	616.2	3,228.1	+62.3%

*FY95: the year in which the 1995 budget plan was approved, budget was allocated to implement comprehensive R&D activities of activities.
 **FY96: The 1996 Basic Plan revised the total to 1996 which plan to spend 41.7 trillion in the next five years (1996-2000).

1. FY1998 S&T Supplemental Budget of science related part

Agency	1997	1998
Ministry of Education, Culture and Sports	1,113	1,113
Ministry of Health and Welfare	102.2	102.2
Other	22.4	22.4
Total	1,237.6	1,237.6



4. Items of inter-ministry measures by supplemental budget

- Research into the effects of endocrine disrupting chemicals ("environmental hormones") 11.2B¥ STA, EA, Monbusho, MAFF, MHW, MITI, MoC
- Research into dioxins 4.2B¥ EA, MHW, MAFF, MITI, MoL
- Genomic related research 8.7B¥ STA, Monbusho, MAFF, MITI
- Building on-line systems for latest advanced research information 3.7B¥ STA & Monbusho
- 10,000 post doctoral researchers programme additional 984 researchers, totalling to 9,756 STA, MITI, Monbusho
- Building a Directory Data Base, linking research activities of national research institutes and universities and open on internet 0.3 B¥ STA & Monbusho

EA: Environmental Agency

MHW: Ministry of Health and Welfare

MoC: Ministry of Construction

MoL: Ministry of Labour

5. STA's Major Supplemental Budget Items

- Strengthening brain research 5.3B¥
- International Space Station and others 18.7B¥
- Strengthening earth observation systems 2.1B¥
- Renovational measures for ageing national research institutes 10.3B¥
- Marine Science and Technology, including MAMSTEC's building a new AUV (autonomous unmanned submersible vehicle) 3.0B¥
- Construction of a new evaluation facility for the 'frontier structural materials' under the on-going New Advanced Structural Materials R&D programme 2.2B¥
- Consolidating Spring 8 utilisation facilities 5.2B¥
- Strengthening supporting system for venture 5.2B¥

4. Items of inter-ministry measures by supplemental budget

Research into the effects of endocrine disrupting chemicals ("environmental hormones")	11.384	STA, EA, Ministry of Health, MHW, MITI, MoC
Research into dioxins	4.284	EA, MHW, MAFF, MITI, Min.
Genomic related research	8.784	STA, Ministry of Health, MITI
Building on-line systems for latest advanced research information	3.784	STA & Ministry
10,000 post doctoral researchers programmes	additional 984	STA, MITI, Ministry
	totaling to 9,716	
Building a Directory Data Base linking research activities of national research institutes and universities and open to internet	9.3 84	STA & Ministry

Co-ordinating Agency: MHW, Ministry of Health and Welfare
 Main Administrative Agency: MITI, Ministry of Science and Technology

5. STA's Major Supplemental Budget Items

Strengthening basic research	2.184
International Space Station and others	18.384
Strengthening earth observation systems	1.184
Environmental measures for saving natural resources	10.384
Basic Science and Technology including M/ASTEC's building a new AUV (Autonomous Undersea Vehicle)	3.084
Construction of a new evaluation facility for the "Frontier Science & Technology" under the on-going New Advanced General Materials R&D programme	3.384
Constructing Spacing & utilization facilities	2.284
Strengthening supporting systems for various	2.284

firms' R&D by building a new 'RIKEN Science Town' next to RIKEN

6. Monbusho's major science supplemental budget items

- Renovations and Sophistication of research facilities of national universities 111.5B¥
- Building new campuses and facilities, including land purchases for Tokyo University Kashiwa campus, Kyushu University and Kagawa University 52.5B¥
- Post-doctoral increase Programme 1.2 B¥
- Building new university-industry collaboration systems 17.0B¥
- Funding LHC programme of CERN 5.0B¥

7. MITI's Industrial S&T supplemental budget items

MITI's Industrial S&T supplemental budget amounts to about 180.4B¥. Its consists of three categories:

- information/communications 110.0B¥
- Science and Technology 54.6B¥
- Environment/new energy 22.7B¥

In addition to these, considerable amounts are allocated to measures toward small-medium-sized industries (262.2B¥) and measures for ventures (103.9B¥)

Major items

- Promoting substantial introduction of electronic commerce 50.0 B¥
- Creation of next generation digital industries, covering software and contents developments 26.5B¥
- Accelerating informatization in education 8.0B¥
- Promotion of regional informatization, including utilisation of GIS 6.5B¥
- R&D for generic technologies for electronic devices 6.0B¥
- Consolidating AIST research facilities, including an AIST Tsukuba Industry-Government Joint Research Building and renovation of dioxin experimental facility 17.7B¥

firm, R&D by building a new RIKEN Science
Town, next to RIKEN

6. Akashi's major science supplemental budget items

●	Renovation and Organization of research facilities of national universities	111.5B¥
●	Building new campuses and facilities, including land purchases for Tokyo University, Kansai University, Kyoto University and Nagoya University	52.5B¥
●	Post-doctoral research programs	1.1B¥
●	Building new university-industry cooperation systems	17.0B¥
●	Funding LHC programme at CERN	2.0B¥

7. MITI's Industrial R&T supplemental budget items

MITI's Industrial R&T supplemental budget amounts to about 150.4B¥. It consists of three categories:

●	Information communication	110.0B¥
●	Science and Technology	34.0B¥
●	Environment/energy	22.7B¥

In addition to these, supplementary amounts are allocated to research toward small-medium sized industries (20.1B¥) and research for ventures (10.3B¥).

Dispositions

●	Promoting substantial introduction of electronic components	50.0B¥
●	Creation of new generation digital industries, covering software and hardware developments	26.2B¥
●	Accelerating information in education	5.0B¥
●	Expansion of regional information, including utilization of GIS	6.2B¥
●	R&D for genetic technologies for electronic devices	6.0B¥
●	Consolidating AIST research facilities including in AIST Japan Industry-Government Joint Research Building and renovation of their experimental facility	17.7B¥

A GENERAL BRIEF ON THE JAPANESE S&T BUDGET FOR FY1998

- Promotion of "immediate effect type" technological development projects for new industries in the areas of electronics, information, environmental and medical/welfare technologies 24.4B¥
- Promotion of ultra advanced electronic technological development, including ultra minute processing technology 5.0B¥
- Consolidating environmental related facilities, including up-grading "Eco-towns" schemes and introduction of environmental friendly energy facilities such as solar and wind energy generations 12.0B¥
- Development/demonstration of environment related technologies, including emission control/reduction of dioxin and CO2 10.7B¥

Yasuko Otsuka (Ms)

Science and Technology Section 22/5/98

3. In basic science spending, life sciences, especially genome and brain related research have gained substantial increases. Following the Brain Research Institute set up in RIKEN last year, a "Genome Frontier Research Institute" will be set up in FY1998. The total budget for FY1998 of the ten ministries involved in the promotion of life science R&D amounts to 142.0 B¥, an increase of 8%.

4. Monbucho will undertake feasibility studies in FY1998 to set up two new institutes: "Global Environment Science Research Institute" and "Central Information Science Research Institute".

5. MITI's priority is to implement the "Action Plan for Economic Structure Reform" made by the Hashimoto Cabinet in the 15 designated areas to improve the stagnant Japanese economy. Under the "Industrial S&T R&D scheme which creates new industries", a new MITI's collaborative scheme with university professors will start to explore university's technology. Measures to support procedures of patent applications and to utilize commercialized patents will be taken.

- Promotion of "immediate effect type" technological development projects for new industries in the areas of electronics, information, environmental and medical/welfare technologies 24424
- Promotion of ultra advanced electronic technological development, including ultra minute processing technology 2084
- Consolidating environmental related facilities, including up-grading "low-tech" industries and introduction of environmental friendly energy facilities such as solar and wind energy generations 12084
- Development/demonstration of environment related technologies, including emission control reduction of toxins and CO2 10734

Yasuko Otsuka (61)
Science and Technology Section 121728

A GENERAL BRIEF ON THE JAPANESE S&T BUDGET FOR FY1998

1. The total science and technology related government budget for FY1998 amounts to **3,032 billion yen (B¥)**, an increase of 1.0% against the initial budget of FY1997, but 14 B¥ less than the requested budget (3,046B¥). It consists of the General Account (1,500B¥, +1.3%) and the Special Account (1,532B¥, +0.7%). This is due to the government's determination to keep the government deficit below 3% against GDP by the FY2003. As a result, it is difficult to achieve the target set in 1996 by the "Science and Technology Plan" to invest 17 trillion yen by the year of 2000. Budget figures by ministry is at attachment 1.
2. A steady implementation of the Science and Technology Plan is clear from the FY1998 S&T budgets. Its basic R&D guidelines to invest basic creative research which meet social and economic needs whilst underpinning new industries have been well reflected in the funding across MITI, the Science and Technology Agency (STA) and Ministry of Education (Monbusho). Monbusho and MITI call for more substantial collaboration between university and industry. Measures to create a new research environment have been implemented by increases of more competitive research funding, increasing the numbers of post-doctoral fellowships and implementing a contract researcher system. Also based on the "general guideline of the government research evaluation" by the Council of Science and Technology (CST), related ministries have started to undertake their own research evaluation.
3. In basic science spending, life sciences, especially genome and brain related research have gained substantial increases. Following the Brain Research Institute set up in RIKEN last year, a "Genome Frontier Research Institute" will be set up in FY1998. The total budget for FY1998 of the ten ministries involved in the promotion of life science R&D amounts to 182.0 B¥, an increase of 8%.
4. Monbusho will undertake feasibility studies in FY1998 to set up two new institutes: "Global Environment Science Research Institute" and "Central Information Science Research Institute".
5. MITI's priority is to implement the "Action Plan for Economic Structure Reform" made by the Hashimoto Cabinet in the 15 designated areas to improve the stagnant Japanese economy. Under the "Industrial S&T R&D scheme which creates new industries", a new MITI's collaborative scheme with university professors will start to explore university's technology. Measures to support procedures of patent applications and to utilise uncommercialized patents will be taken.

A GENERAL BRIEF ON THE JAPANESE S&T BUDGET FOR FY1998

1. The total science and technology related government budget for FY1998 amounts to 2,932 billion yen (B¥), an increase of 1.0% against the initial budget of FY1997, but 14 B¥ less than the requested budget (3,046B¥). It consists of the General Account (1,500B¥ +1.3%) and the Special Account (1,432B¥ +0.7%). This is due to the government's determination to keep the government deficit below 3% against GDP by the FY2003. As a result, it is difficult to achieve the target set in 1996 by the "Science and Technology Plan" to invest 17 billion yen by the year of 2000. Budget figures by ministry is at attachment 1.

2. A steady implementation of the Science and Technology Plan is clear from the FY1998 S&T budget. In basic R&D guidelines to invest basic creative research which meet social and economic needs while underpinning new industries have been well reflected in the funding across MITI, the Science and Technology Agency (STA) and Ministry of Education (Monbusho). Monbusho and MITI call for more substantial collaboration between university and industry. Measures to create a new research environment have been implemented by increases of more competitive research funding, increasing the number of post-doctoral fellowships and implementing a compact research system. Also based on the "General Guidelines of the Government research evaluation" by the Council of Science and Technology (CST), related ministries have started to conduct their own research evaluation.

3. In basic science spending, life sciences, especially genome and brain related research have gained substantial increases. Following the Brain Research Institute set up in RIKEN last year, a "Genetic Research Institute" will be set up in FY1998. The total budget for FY1998 of the six ministries involved in the promotion of life science R&D amounts to 1,520 B¥, an increase of 5%.

4. Monbusho will undertake feasibility studies in FY1998 to set up two new institutes "Global Environment Science Research Institute" and "Central Information Science Research Institute".

5. MITI's priority is to implement the "Action Plan for Economic Structure Reform" made by the Hashimoto Cabinet in the 15 designated areas to improve the stagnant Japanese economy. Under the "Industrial S&T R&D scheme which creates new industries", a new MITI-cooperative scheme with university professors will start to explore university technology. Measures to support procedures of patent applications and to utilize uncommercialized patents will be taken.

6. Increasing basic and competitive research funds can be seen across STA, Monbusho and MITI. Their total amounts to

- *Special Coordination funds (CST):*
- *CREST: Core Research for Evolutional S&T (ATS/JST) 27.4B¥*
- *Grants-in -aid (Monbusho) 117.9B¥*
- *Research for the Future Programme (Monbusho/JSPS) 21.6B¥*
- *Proposal-based creative R&D promotion programme (MITI/NEDO) 5.0B¥*

7. In order to remove ministerial barriers and to spend limited budget effectively, STA has given priority to the promotion of inter-ministerial and cross-sectional policies in the S&T policy coordination agency. The areas include life sciences (genome, brain, genetic resources, sugar-chain technology), information (high performance transmission and processing, geographic information system), earth science and environment (global climate change prediction and ocean drilling programme) and health and safety of life (disaster prevention, disease prevention, environmental hormone disturbance and medical and welfare equipment development)

8. As predicted, budgets for the large-scaled projects in space and nuclear energy have been curtailed. STA decided to cut 80 billion yen (B¥) from the existing space project for the next five years. However, the total government budget for space in FY1998 shows an increase of 1.4%, totalling 247.4B¥. But the total government nuclear related budget for FY1998 sees a minus growth of 3.8%, amounting to 477.4B¥. A nuclear fusion project including ITER sees a minus growth by 5.8%. The Power Reactor & Nuclear Fuel Development Corporation (PNC) which is responsible for the recent "Monju" accident, will be reorganised. The government is determined to restore people's confidence in nuclear energy.

9. The Hashimoto Government will give priority in the forthcoming diet sessions on the Administrative Reformation Bill, in which a merger of STA and Monbusho is currently being proposed. With MITI starting collaboration with Universities, its realisation will create a more integrated S&T administrative system.

10. For further detailed budgets of STA, MITI and Monbusho, please see attachment 2-STA, Attachment 3-AIST/MITI and Attachment 4-Monbusho.

Yasuko Otsuka (Ms), S&T Section (9/4/98)

10. For further details of STA, MITI and NEDO, please see Attachment 1-STA, Attachment 1-A-STA, MITI and NEDO, and Attachment 4-Ministry.

create a more integrated STA administrative system.

9. The Ministry Government will give priority in the forthcoming fiscal year to the Administrative Reform Bill, in which a merger of STA and NEDO is currently being proposed. With MITI having collaboration with NEDO, the merger will

create energy.

Government Corporation (GNC) which is responsible for the "Energy" business, will be organized. The government is determined to create people's confidence in

including IER and a major growth by 1.5%. The Energy Research & Innovation Fund FY1998 was a major growth of 1.5% amounting to 17.3 billion yen. A major project

amount of 1.5% totaling 17.3 billion yen. The total government budget for fiscal year 1998 was 17.3 billion yen. However, the total government budget for fiscal year 1998 was 17.3 billion yen. STA decided to cut 10 billion yen (5%) from the existing budget for the

As projected budget for the large-scale project in space and nuclear energy have been

and other equipment development).
(Energy research, atomic power, other environmental protection and medical
climate change prediction and ocean drilling programs) and health and safety of life
protecting, geographic information systems, earth science and environment (global
ecosystem, space technology, information (high performance transmission and
SET policy coordination agency. The areas include life sciences (genetic, brain, genetic
given priority to the promotion of inter-ministerial and cross-sectional policies in the
In order to remove minimal barriers and to spend limited budget effectively, STA has

- Proposed a new research R&D promotion programs (MITI/VEDG) - 2.084
- Research for the Future Programme (Mitsubishi/USP) - 21.634
- Grants-in-aid (NEDO) - 117.987
- CREST Core Research for Evolutional SET (ATLAS) - 27.484
- Special Coordination Funds (CST)

MITI. Their total amounts to

Increasing basic and competitive research funds can be seen across STA, Ministry and

Summary Table of FY1998 Science & Technology Expenditures in the Government Draft Budget

(unit: 100million yen)

Classification	Fiscal Year	1997 budget	1998 Draft budget	Increase(decrease) rate than the previous year(%)
Science and technology promotion expenditures		8,493	8,907	4.9
Other research expenditures		6,318	6,094	△ 3.6
Science and technology expenditures in the general accounts		14,811	15,001	1.3
Science and technology expenditures in the special accounts		15,215	15,319	0.7
Total science and technology expenditures		30,026	30,319	1.0

1998 Science and Technology Expenditures in the Government Draft Budget

(unit: million yen)

Item Ministry and agency	Science and technology promotion expenditures in the general account	Rate of increase decrease from the previous year (%)	Science and technology expenditures in the general account	Rate of increase decrease from the previous year (%)	Science and technology expenditures in the special account	Rate of increase decrease from the previous year (%)	Total budget for science and technology expenditures	Rate of increase decrease from the previous year (%)
	(A)		(B)		(A) + (B)			
National Diet	611	3.3	611	3.3	—	—	611	3.3
Science Council of Japan	—	—	1,306	△ 3.3	—	—	1,306	△ 3.3
National Police Agency	2,124	42.3	2,147	41.7	—	—	2,147	41.7
Hokkaido Development Agency	219	4.4	220	4.3	—	—	220	4.3
Defense Agency	—	—	144,176	△ 17.8	—	—	144,176	△ 17.8
Economic Planning Agency	1,032	△ 3.1	1,032	△ 3.1	—	—	1,032	△ 3.1
Science and Technology Agency	399,580	4.6	585,122	2.4	155,010	△ 4.9	740,132	0.8
Environment Agency	16,733	3.7	19,575	8.8	—	—	19,575	8.8
National Land Agency	—	—	689	45.6	—	—	689	45.6
Ministry of Justice	2,062	2.4	2,062	2.4	—	—	2,062	2.4
Ministry of Foreign Affairs	—	—	12,432	△ 4.3	—	—	12,432	△ 4.3
Ministry of Finance	768	3.5	924	5.9	1,481	14.1	2,405	10.8
Ministry of Education, Science, and Culture	176,069	5.9	342,755	5.7	968,329	0.4	1,311,084	1.7
Ministry of Health and Welfare	74,437	4.9	79,878	4.3	15,242	2.2	95,120	3.9
Ministry of Agriculture, Forestry, and Fisheries	89,737	4.0	101,027	3.4	3,208	△ 0.1	104,235	3.3
Ministry of International Trade and Industry	82,089	5.2	127,225	5.0	365,556	4.1	492,782	4.4
Ministry of Transportation	15,179	3.9	21,838	△ 0.3	1,212	△ 0.1	23,051	△ 0.3
Ministry of Posts and Telecommunications	20,971	4.9	34,547	9.1	26,000	0.0	60,547	5.0
Ministry of Labor	908	2.4	915	2.4	2,973	△ 13.7	3,888	△ 10.4
Ministry of Construction	7,414	4.7	20,708	1.3	18,839	1.9	39,547	1.6
Ministry of Home Affairs	766	1.1	866	12.3	—	—	866	12.3
Total	890,699	4.9	1,500,056	1.3	1,531,851	0.7	3,031,906	1.0

Note: 1. Figures in this table are from STA's unofficial calculations.

2. Because in the amount in the table have been rounded, the sum of the amounts in each column may not equal to the totals

Attachment 1-STA

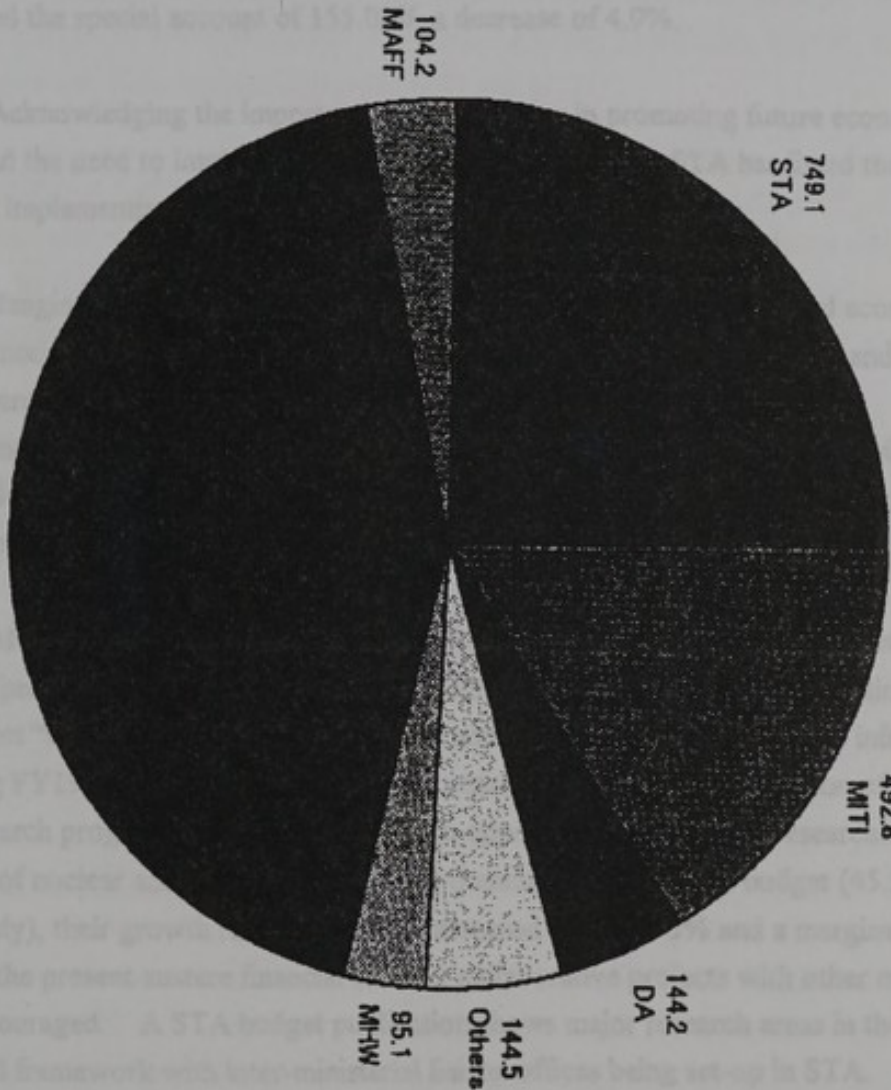
A BRIEF NOTE ON THE FY1998 BUDGET OF THE SCIENCE AND TECHNOLOGY AGENCY (STA)

Summary

1. The total STA budget for FY1998 is 749.1 billion yen (B¥), an increase of 0.8% against the FY1997 initial budget. The budget consists of a general account of 545.1B¥, an increase of 2.4%, and the special account of 159.1B¥, a decrease of 4.7%.

2. Acknowledging the importance of promoting future economic structural change and the need to invest in science and technology, the STA has set the following five points for implementation:

- challenging frontier science
 - practical science and technology
 - infrastructure
 - personnel
 - management
- Following FY1997, the STA has been working to achieve these goals. Although the share of nuclear science and technology in the STA budget (+5.3% in 24.7% respectively), their growth has been slow. In the present nuclear energy policy, which encourages nuclear power, nuclear science and technology are being encouraged. A STA budget for nuclear science and technology is being set up in STA.



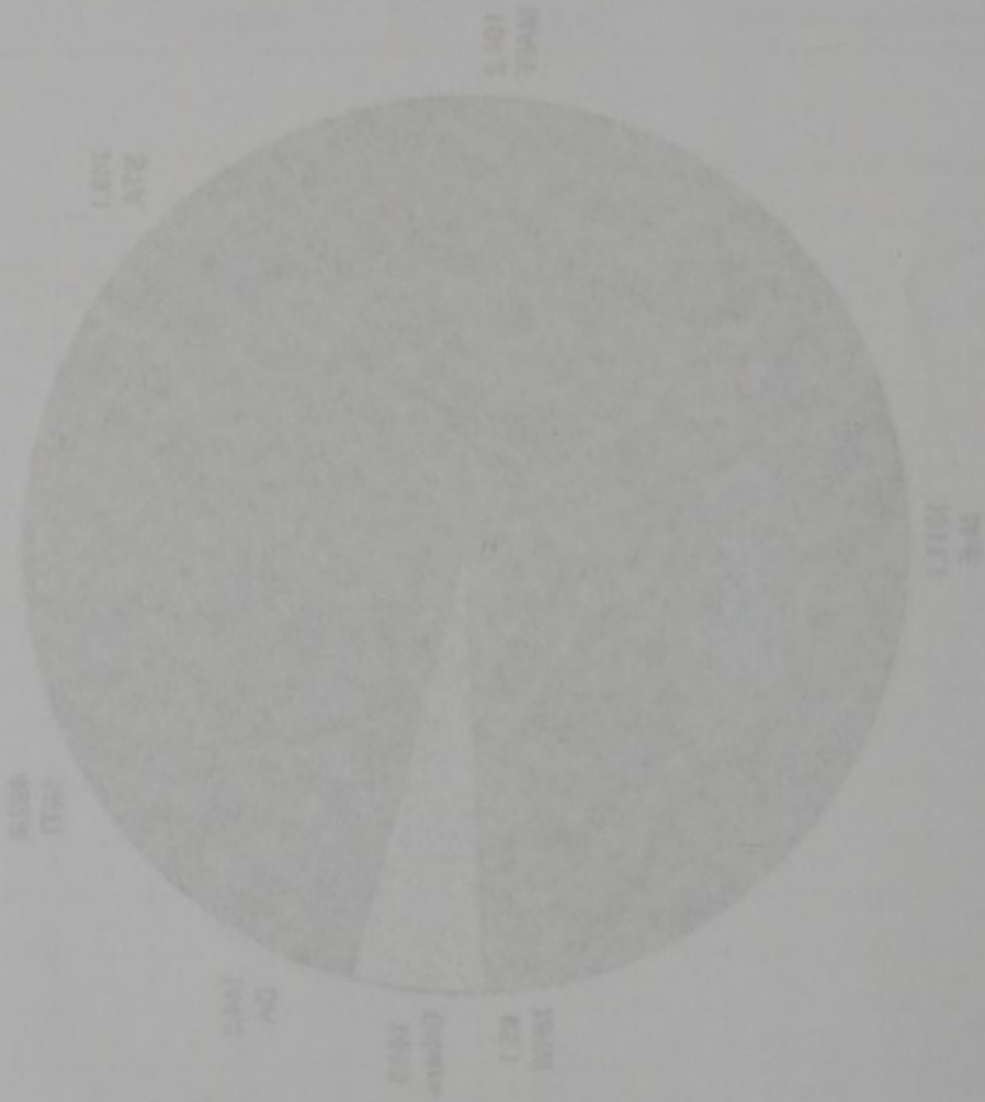
New and scaled-up initiatives in FY1998

"Geno Frontier Exploration Research"

7.68B¥ (+173.7%)

In response to the recommendation to promote genome research made by the Council of Science and Technology (CST) in July 1997, interministerial and integrated R&D will be made to elucidate functions of genes (human beings, animals and plants) as well as proteins those genes produce. A new "Geno Frontier Exploration Research Centre" will be set up at RIKEN. A CST panel on genome will work out long term R&D policies shortly. Ministries involved will be STA, MTTI,

2001 Yr Budget for FY 2002
 Total 2002 Budget for FY 2002



Attachment 2 -STA

A BRIEF NOTE ON THE FY1998 BUDGET OF THE SCIENCE AND TECHNOLOGY AGENCY (STA)

Summary

1. The total STA budget for FY1998 is 740.1 billion yen (B¥), an increase of 0.8% against the FY1997 initial budget. The budget consists of a general account of 585.1B¥, an increase of 2.43%, and the special account of 155.0B¥, a decrease of 4.9%.

2. Acknowledging the importance that S&T play in promoting future economic structural change and the need to implement further the Basic S&T Plan, STA has listed the following five points for implementing the FY1998 budget:-

- challenging unexplored S&T fields in correspondence to the social and economic needs;
- promoting creative basic research and constructing a new R&D system and R&D infrastructure;
- promoting S&T needed to secure people's safe and affluent standard of living;
- stable supply of atomic energy based on safety assurances and public understanding; and
- positive development of international S&T activities

3. Much importance has been given to the promotion of life sciences (a new "Gene Frontier" programme and the scaling up of brain science research) and information sciences (a new project "to realize ultra fast transmission and processing of large volume information"). Following FY1997, the trend continues to increase funding for the promotion of the competitive basic research programmes as well as research opportunities for young researchers. Although the share of nuclear and space budgets is still dominant in the STA's budget (45.5% & 24.7% respectively), their growth rates have been decreased to minus 5% and a marginal increase of 1.0%. In the present austere financial climate, collaborative projects with other ministries are being encouraged. A STA budget publication shows major research areas in the inter-ministerial framework with inter-ministerial liaison offices being set-up in STA.

New and scaled up initiatives to note:

"Gene Frontier Exploration Research"	7.0B¥ (+173.7%)
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In response to the recommendation to promote genome research made by the Council of Science and Technology (CST) in July 1997, interministerial and integrated R&D will be made to elucidate functions of genes (human beings, animals and plants) as well as proteins those genes produce. A new "Gene Frontier Exploration Research Centre" will be set up at RIKEN. A CST panel on genome will work out long term R&D policies shortly. Ministries involved will be STA, MITI,

A BRIEF NOTE ON THE FY1998 BUDGET OF THE SCIENCE AND TECHNOLOGY AGENCY (STA)

SUMMARY

1. The total STA budget for FY1998 is 740.1 billion yen (99), an increase of 0.7% against the FY1997 initial budget. The budget consists of a general account of 583.1B, an increase of 3.4%, and the special account of 157.0B, a decrease of 4.9%.

2. Acknowledging the importance that S&T play in promoting future economic structural change and the need to implement further the Basic S&T Plan, STA has fixed the following five policies for implementing the FY1998 budget:

- strengthening research S&T fields in correspondence to the social and economic needs;
- promoting creative basic research and constructing a new R&D system and R&D infrastructure;
- promoting S&T needed to ensure people's safe and efficient standard of living;
- main supply of stable energy based on highly innovative and public understanding; and
- positive development of international S&T activities.

3. Basic importance has been given to the promotion of the science (a new "Genetic Frontier" programme and the setting up of basic science research) and technology (a new project "to realize the future through the transmission and processing of high-value information"). Following FY1997, the main emphasis is placed on furthering the promotion of the cooperative basic research programme as well as research opportunities for young researchers. Although the share of nuclear and space budget is still dominant in the STA's budget (45.3% in FY97 respectively), their growth rates have been decreased to around 3% and a significant increase of 1.0% in the present science research (basic research) and technology (applied research) sectors are being encouraged. A STA budget reduction shows major research areas in the international framework and internationalization efforts being set-up in STA.

Key words and abbreviations

"Genetic Frontier Research Programme"	GENETIC FRONTIER PROGRAMME (GFP)
In response to the recommendation to promote genetic research made by the Council of Science and Technology (CST) in July 1997, the government and agencies (STA) will make to establish functions of genetic research (basic research, applied research and technology) as well as promote their growth.	
A new "Genetic Frontier Research Programme" will be set up at NIKKEN. A CST fund on genetic will work out long term R&D policies jointly. Administrations involved will be STA, MITI,	

Ministry of Agriculture, Forestry and Fisheries (MAFF), Ministry of Health and Welfare (MHW), Monbusho (Ministry of Education). So far Japanese genome research funding has been split by ministries and there has been little coordination.

Brain science research	14.0B¥ (+40.4%)
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8.8B¥ has been allocated to the Brain Science Institute in RIKEN to undertake three research areas of "Elucidating brain functions", "conquering brain diseases" and "developing neurocomputers". Additional 5.1B¥ will be allocated for brain research. STA promote more collaborative research of brain with other ministries including Monbusho, MHW, MAFF, Ministry of Posts and Telecommunications (MPT) and MITI.

Information Science Research	14.2B¥ (+55.1%)
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- 12.1B¥ has been allocated for promoting "advanced computational science and technology", including the development of "Earth Simulator" (4.2B¥). It will be equipped with 1000 times higher simulation capacity and capable of simulating complex phenomena at global scales.
- 2.0 B¥ has been allocated for a new programme, aiming to "realize ultra fast transmission and processing of large volume information". STA, Monbusho, MITI and MPT will undertake research jointly to realize a society with highly sophisticated information networks.

Stratospheric platform R&D	0.46B¥ (+347%)
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Stationed at a height of about 20km, it aims to be used for earth observation and communication. R&D will be undertaken jointly with MPT and private sectors.

Space Research and Development	182.5B¥ (+1.0%)
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In response to government financial reform, STA decided to cut 80B¥ for the existing projects over the next five years and aims to promote more cost effective R&D. Major space development projects include "HOPE-X" (4.9B¥), an experimental unmanned space shuttle to supply to the Japanese module of the International Space Station, the "SELENE" (0.2B¥), moon probe mission which will be undertaken jointly with the Institute of Space and Aeronautical Science (ISAS), "Engineering Test Satellite 8" (3.0B¥), "Advanced Land Observation Satellite" (1.2B¥), "ADEOS-II" (18.7B¥), International Space Station programme (29.4B¥) and H-II rocket R&D (20.9B¥).

Deep-sea drilling ship system R&D	0.61B¥
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R&D of next generation supersonic transportation (SST)	2.55B¥
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Ministry of Agriculture, Forestry and Fisheries (MAFF), Ministry of Health and Welfare (MHW), Ministry of Education. So the Japanese genome research funding has been split by minister and there has been little coordination.

Brain science research	14.0B¥ (+40.4%)
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1. RIKEN has been allocated to the Brain Science Institute in RIKEN to undertake three research areas of "elucidating brain functions", "comparing brain diseases" and "developing neuroprotection". Additional 1.1B¥ will be allocated for brain research. STA promotes more collaborative research of brain with other ministries including MAFF, MHW, MAFF, Ministry of Post and Telecommunications (MPT) and MITI.

Information Science Research	14.3B¥ (+22.1%)
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- 12. RIKEN has been allocated for promoting "advanced computational science and technology", including the development of "Earth Simulator" (4.1B¥). It will be equipped with 1000 times higher simulation capacity and on-site of simulating complex phenomena at global scales.
- 2.0 B¥ has been allocated for a new programme, aiming to "realize ultra fast transmission and processing of large volume information". STA, MAFF, MHW, MPT and MITI will conduct a research jointly to realize a society with highly sophisticated information network.

Telecommunications Research	9.4B¥ (+24.1%)
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Grounded at a height of about 10m, it aims to be used for earth observation and communication. R&D will be conducted jointly with MPT and private sector.

Space Research and Development	107.5B¥ (+1.6%)
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It is agreed to promote more forward research. STA decided to cut 500M for the existing projects over the next five years and aim to promote more cost effective R&D. Major space development projects include "MOSE-X" (1.9B¥) an experimental research space station to apply to the Japanese module of the International Space Station, the "TUMOR" (0.2B¥) moon probe mission which will be conducted jointly with the Institute of Space and Astronautical Sciences (ISAS), "Experimental Test Satellite 2" (0.5B¥), "Advanced Land Observation Satellite" (1.1B¥), "ADONIS" (0.2B¥), International Space Station programme (29.4B¥) and H-II rocket R&D (20.9B¥).

Deep-sea & Underwater system R&D	5.4B¥
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R&D of steel structure systems (SST)	2.2B¥
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Promotion of Competitive Basic Research	67.7B¥ (+8.1%)
(1) CREST: Core Research for Evolutional Science and Technology Programme	27.4B¥
(2) Special Coordination Funds for Promoting S&T	27.0B¥
(3) ERATO Programme	2.8B¥
(4) Frontier Programme at RIKEN	2.8B¥

Importance has been continuously given to investment in basic research in order to build "intellect stocks" for creating new industries. .

Building up Flexible R&D System to Make Research Society Open Beyond Ministerial and Sectorial Barriers	27.5B¥ (+30.9%)
(1) "Open and Interdisciplinary Research System" (new) in which a successful interdisciplinary research group will get about 3.0B¥ in five years.	1.0B¥ (new)
(2) Fostering and securing researchers (promotion of contract researchers, an increase of research-supporters, promotion of "10,000 Post-doc Researcher Scheme"	17.0B¥ (+18.9%)
(3) Promoting exchanges of researchers	15.9B¥ (+25.7%)

Promoting the utilization of R&D results	6.2B¥ (+6.8%)
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JST will set up a new system to support patents applications for the research results made in the national laboratories in order to make a smooth technological transfer from national laboratories to industries. Also JST will expand comprehensive technological databases, covering mainly research results made by national research institutes.

Promotion of regional R&D	14.7B¥ (+18.1%)
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Consolidating and improving R&D Infrastructures	44.1B¥ (-4.9%)
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This category includes improving research information networking (7.3B¥), consolidating intellectual infrastructures (3.8B¥), SPring-8 project (16.5B¥, a minus growth by 14.6%), improving research facilities (8.4B¥) and others. The minus growth is due to the completion of constructing Spring.

Promoting the public understanding toward S&T	1.8B¥ (+33.9%)
(1) Test broadcasting "Science Channel" on cable television	0.2.5¥ (new)
(2) Sophistication of science museums and promoting science related activities addressing general public and young people	1.5B¥ (+11.2%)

Implementing impartial evaluation at national research institutes	0.14B¥ (+123%)
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STA will undertake a comprehensive promotion of R&D evaluation of national research institutes as well as a survey regarding research evaluation.

Improving measures for safety and disasters (by earthquakes and heavy snow)	15.9B¥ (+8.0%)
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Ensuring a steady supply of energy based on safety and public understanding	
(1) Safety measures	64.9B¥ (+26.4%)
(2) Public understanding and opening up nuclear related information	38.3B¥ (+10.4%)
(3) Nuclear fuel cycle R&D, including "monju", reprocessing of used fuels and advanced cycling technology	81.1B¥ (-11.5%)
(4) Strengthening backend measures, including high level nuclear waste disposals	42.1B¥ (-9.4%)

Positive Promotion of International S&T Activities	
(1) Promotion of international research exchanges, including STA fellows (3.7B¥) and other joint research programmes	9.9B¥
(2) Participation in the Space Station programme	29.4B¥
(3) Participation in ITER programme	3.8B¥
(4) Human Frontier Science Programme	2.6B¥
(5) S&T cooperation with Asian and pacific countries and former USSR	4.6B¥

Note: Please note that some items are counted twice in the different categories, for example, "Space Station" at "space development" and "International cooperation projects".

Y Otsuka (Ms)

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Implementing impartial evaluation at national research institutions	0.14BY (+13.9%)
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STA will undertake a comprehensive promotion of R&D evaluation of national research institutions as well as a survey regarding research evaluation.

Improving measures for safety and disaster (by earthquakes and heavy snow)	18.7BY (+8.9%)
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Ensuring a steady supply of energy based on safety and public understanding	
(1) Safety measures	64.9BY (+36.4%)
(2) Public understanding and opening up nuclear related information	38.3BY (+10.4%)
(3) Nuclear fuel cycle R&D, including "waste", improvement of road rules and advanced cycling technology	81.1BY (+11.3%)
(4) Strengthening backup and measures including high level nuclear waste disposal	42.1BY (+3.4%)

Promote Promotion of International S&T Activities	
(1) Promotion of international research exchange including STA efforts (I, II, III) and other joint research programs	7.3BY
(2) Participation in the Space Science program	39.4BY
(3) Participation in ITER program	1.8BY
(4) Japanese Frontier Science Program	1.6BY
(5) S&T cooperation with Asia and Pacific countries and Europe	4.6BY

Note: These items that some items are counted twice in the different categories, for example, "Space Station" in "space development" and "international cooperation projects".

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Attachment 3 - AIST/MITI

MINISTRY OF INTERNATIONAL TRADE AND INDUSTRY (MITI) INDUSTRIAL SCIENCE AND TECHNOLOGY BUDGET FOR FY1998

Summary

1. MITI's total industrial science and technology budget for FY1998 is 492.8 billion yen (B¥), an increase of 4.4%. This is made up of the General Account (127.2B¥, accounting for 25.5%) and the Special Account (365.6B¥, accounting for 74.2%). It's priority is to materialise the "Action Plan for Economic Structure Reform" - a medium-term plan adopted by the Hashimoto Cabinet in May 1997, which has designated *15 fields in order to create new industries by 2001. The main points are:-

- (1) to invest R&D resources significantly for the designated *15 areas and to implement their policies systematically in order *to create technological seeds which can then be farmed commercially;*
- (2) *to promote collaboration among industry, academia and government* and to strengthen MITI research institutes' activities in a competitive research environment in order to realise more efficient and effective technological development and utilisation of R&D results; and
- (3) *to promote a comprehensive intellectual property strategy* by positive generation of international standards and by consolidating intellectual infrastructure, including a patent system up-grade.

(* designated 15 areas include medical care and welfare, quality of life and culture, information and telecommunications, new manufacturing technology, distribution and logistics, environment, business support, ocean, biotechnology, improving urban surroundings, aviation and space, new energy and energy conservation, human resources, economic globalization, and housing.)

THE HIGHLIGHTS OF THE MITI INDUSTRIAL S&T BUDGET FY98

2. Measures To Promote R&D Programmes Which Create New Industries in the Designated 15 Areas:

- (1) Establishment of New Industry-Creation Type Industrial S&T R&D System
30B¥ (+6.9%)

To realise a high-powered R&D promotion for creating new industrial seeds in the corresponding 15 areas, the above programme has been set up by adding the following two

MINISTRY OF INTERNATIONAL TRADE AND INDUSTRY (MITI) INDUSTRIAL SCIENCE AND TECHNOLOGY BUDGET FOR FY1994

SUMMARY

1. MITI's total industrial science and technology budget for FY1994 is 492.3 billion yen (US\$ 4.44 billion). This is made up of the General Account (127.13B, accounting for 25.7%) and the Special Account (365.2B, accounting for 74.3%). MITI's priority is to maintain the "Action Plan for Economic Revitalization" - a medium-term plan adopted by the Hashimoto Cabinet in July 1992, which has designated "12 fields in order to create new industries by 2001. The main points are:

- (1) To invest R&D resources efficiently in the designated "12 areas and to implement their policies systematically in order to create technological areas which can then be formed commercially.
- (2) To promote collaboration among industry, academia and government and to strengthen MITI research institutes' activities in a competitive research environment in order to realize more efficient and effective technological development and utilization of R&D results.
- (3) To promote a comprehensive industrial property strategy by positive promotion of international standards and by consolidating intellectual infrastructure, including a patent up-grade system.

(*) The above 12 areas include: (a) new and useful goods of high quality and value added; (b) new and useful services; (c) new and useful information technology; (d) new and useful environmental technology; (e) new and useful energy technology; (f) new and useful materials technology; (g) new and useful agricultural, forestry and fisheries technology; (h) new and useful health and medical technology; (i) new and useful food and food processing technology; (j) new and useful environmental technology; (k) new and useful information technology; (l) new and useful services.

THE BUDGETARY POLICY OF THE MINISTRY OF INTERNATIONAL TRADE AND INDUSTRY

2. Measures To Promote R&D Programs Which Create New Industries in the Designated 12 Areas
 - (1) Establishment of New Industry-Creation Type Industrial S&T R&D System (200B (44.5%))
- To realize a high-powered S&T program for creating new industrial areas in the designated 12 areas, the above program has been set up by adding the following two corresponding 12 areas:

new schemes to the existing "Industrial Science and Technology Frontier Programme". A budget list by item is in the attachment 3-2.

i) "R&D Project in Collaboration with University"- a new scheme

2.2 B¥ has been allocated to explore new ideas and theories of university researchers for the actual commercialisation by collaborating with company researchers. In FY1998, R&D projects are implemented under the following four themes :-

- R&D on intelligent materials and structural systems
- R&D on High Functional Materials Design Platforms
- R&D on Cat-CVD Semiconductor Device Manufacturing Process
- R&D on Creation Technology of Particle Applied Bio-Combined Materials

ii) "R&D Project on Application of Industrial Technologies" - new scheme

2.1 B¥ has been allocated to support high risk technological R&D which cannot be conducted by the private sector. Under this category, the following two research themes have been adopted:-

- R&D on Nanometer control Optic Disc Systems
- R&D on Human-Harmonized and Coexisting Robot Systems

iii) "Industrial Science and Technology Frontier Programme"

25.6B¥ has been allocated, a decrease of 8%. In addition to the 17 on-going projects, the following two new R&D projects will start in FY98:-

● **Genome Informatics - 1.5B¥ (a new project)**

Aims to establish a system for decoding and utilising genome information. Research and Development will cover four themes:-

- i) Gene expression and regulatory networks
- ii) Comprehensive analysis of gene expression
- iii) Intragenomic sequence comparison
- iv) Predicting gene function based on genomic sequences

● **Frontier Carbon Technology - 1.49B¥ (a new project)**

Carbon materials including fullerenes, carbon nanotubes, carbynes, carbon nitride and diamond like carbon have excellent characteristics. This project aims to establish the innovation technology for producing highly functional carbon and related materials (HF-CRMs) that will be used in diverse fields of the 21st century industries. It will be a key material for a variety of industrial fields such as space and aviation development, information processing and communications. R&D covers i) development of basic technology for synthesis,

new schemes to the existing "Industrial Science and Technology Frontier Programme". A budget list by item is in the attachment 2-2.

① "R&D Project in Collaboration with University" - a new scheme
 2.1.1 It has been allocated to explore new ideas and theories of university researchers for the actual commercialization by collaborating with company researchers. In FY1998, R&D

projects are implemented under the following four themes:-

- R&D on intelligent materials and structural systems
- R&D on high functional materials design technology
- R&D on Co-CVD semiconductor device manufacturing process
- R&D on ceramic technology of ferroelectric thin-film materials

② "R&D Project on Application of Industrial Technologies" - new scheme
 2.1.1 It has been allocated to support high tech technological R&D which cannot be conducted by the private sector. Under this category, the following two research themes have been adopted:-

- R&D on microwave control type disc system
- R&D on plasma-sprayed and coating robot system

③ "Industrial Science and Technology Frontier Programme"
 2.1.1 It has been allocated a budget of 200. In addition to the 17 on-going projects, the following two new R&D projects will start in FY98:-

- Genome Information - 1.18B (a new project)
 Aims to establish a system for detecting and utilizing genome information. Research and

development will cover four themes:-

- ① Gene expression and regulatory networks
- ② Comparative analysis of gene expression
- ③ Intragenomic sequence comparison
- ④ Predicting gene function based on genomic sequences

- Frontier Carbon Technology - 1.45B (a new project)
 Carbon materials including fullerenes, carbon nanotubes, carbon nitride and diamond like carbon have excellent characteristics. This project aims to establish the innovation technology for producing highly functional carbon and related materials (CIP-CIMs) that will be used in diverse fields of the 21st century industries. It will be a key material for a variety of industrial fields such as space and aviation development, information processing and communication. R&D covers ① development of basic technology for synthesis

characterization and application of new carbon materials, and ii) surveys on the technologies which need intensive development and identification of targets for specific applications.

(2) Other measures for creating new industries

- 5.1B¥ has been allocated, an increase of 9.5%, for the MITI's competitive research scheme which publicly invites proposals to undertake basic and original research between MITI national institutes, university and industry.
- 2.9B¥ has been allocated, an increase of 32.5%, for the scheme to adopt research themes competitively among MITI national laboratories. It is expected to accelerate MITI's laboratories' producing research results for new industry.
- 2.9B¥ has been allocated, an increase of 22.7%, for the expansion of inter-ministerial collaborative research in the areas of 'clean environment technology', 'genome-related research', 'brain research' and 'seismic research'. To undertake this research, MITI laboratories will collaborate with other ministry's research laboratories.
- 0.7B¥ has been allocated for the research and development necessary to seek international standards, which is vital in the development of the 15 designated industries. This is a new scheme.
- 26.0B¥ has been allocated for the Key Technology Centre. The growth rate is nil.

3. Measures to promote collaboration between MITI laboratory, university and industry

Jointly with Monbusho, MITI is submitting a bill to the current Diet "to promote technology transfer between university and industry". It aims to further promote joint R&D, university's patent acquisition, and for industry to utilise research results generated by university. In addition to the above mentioned new scheme called "R&D Projects in Collaboration with University", the following various measures will be implemented:-

- Regional Consortium R&D Projects through close industrial, academic and government liaison, meeting the needs of regional industry: 3.2B¥ (+57.6%)
- Management and spreading research results of MITI laboratories by increasing the number of 'liaison-men' from 2 to 6.
- Consolidating facilities for a "research on campus" concept to allow cooperative research in response to the needs of companies.
- Subsidies for technology transfer, in particular, for providing technological information (new).
- Establishment of a system which enables MITI laboratories to undertake commissioned research from industry (new)

4. Strengthen the base supporting intelligent technological creation activities

characterization and application of new carbon materials and (b) surveys on the technologies which need intensive development and identification of targets for specific applications.

- (2) Other measures for creating new industries
- 2.13W has been allocated, an increase of 9.5% for the MITI's competitive research scheme which jointly invites proposals to undertake basic and original research between MITI, national industries, university and industry.
 - 2.13W has been allocated, an increase of 33.5% for the scheme to adopt research themes competitively among MITI national laboratories. It is expected to accelerate MITI's laboratories' producing research results for new industry.
 - 2.13W has been allocated, an increase of 22.7% for the expansion of inter-ministerial collaborative research in the areas of "clean environment technology", "genome-related research", "brain research" and "robotic research". To undertake this research, MITI laboratories will collaborate with other national research laboratories.
 - 2.13W has been allocated for the research and development necessary to seek international standards, which is vital in the development of the IT advanced industries. This is a new scheme.
 - 2.13W has been allocated for the Key Technology Centre. The growth rate is 11%.

3. Measures to promote collaboration between MITI laboratories, university and industry
- Jointly with the industry, MITI is introducing a bill to the current Diet "to promote technology transfer between university and industry". It aims to further promote joint R&D, university's patent registration, and for industry to utilize research results generated by university. In addition to the above mentioned new scheme called "R&D Projects in Collaboration with University", the following various measures will be implemented:-
 - Regional Co-operative R&D Projects through close industrial, academic and government liaison, meeting the needs of regional industry. 1,384 (+27.6%)
 - Management and operating research results of R&D laboratories by increasing the number of "person-man" from 1 to 2.
 - Co-ordinating facilities for a "research on campus" concept to allow cooperative research in response to the needs of companies.
 - Subsidies for technology transfer, in particular, for providing technological information (new).
 - First instance of a system which enables MITI laboratories to undertake commissioned research from industry (new).

4. Strengthening the base supporting intelligent technological creation activities

a) Intellectual Property Rights

To raise R&D incentives, measures to protect intellectual property right are important. To promote the utilisation of patents leads to the creation of new industry. In the light of globalization of economic activities, to promote standardisation from an international viewpoint is vitally important, especially to protect Japanese corporate products from infringement in Asian markets. The following measures will be implemented:-

- Setting up "Patent Market" especially for small and medium sized firms to activate distribution of about 360 thousand 'sleeping' patents which have not yet been commercialised (2.5B¥ +22%)
- Promoting effective utilisation of patent information, enabling access through internet (9.0B¥ +12%)
- By the year 2000, granting patents more rapidly, aiming to complete the first examination within 12 months (41.0B¥ +8.2%)
- Early protection of Japanese IPR overseas (2.4B¥ +3%)
- A new project to review JIS specification systems and JIS compatibility to international standards.

b) Consolidating MITI laboratories

- To provide more appropriate research environment in collaborating with university and industry, National Industrial Research Institute of Nagoya, MITI, one of the leading national institutes in advanced ceramic research, will move to the "Human Science Park" (in Nagoya) by the end of FY2001 and a new laboratory called "Advanced Material Computer Science Laboratory" will be built in the same compound.
- Building a high speed giganetwork, linking MITI's eight laboratories in Tsukuba and to promote research cooperation through networks with other related ministerial research institutes.

c) Consolidating intellectual bases

The state of Japanese bases for measurement standards, experiment and evaluation, provision of biological resources information, and the chemical safety database are behind compared to those of other advanced countries. Their rapid improvement is urgently needed.

5. Support of Small and Medium sized Enterprises (SMEs)

- Training personnel to support SMEs' manufacturing bases in wider areas is important. They are a vital source of the nation's economic activity. Japan is becoming an ageing society and young people dislike entering the manufacturing sector. For this reason, new measures are to be implemented, including setting up "regional manufacturing councils" with the cooperation of local government bodies and other training schemes.

3) Intellectual Property Rights

- To raise R&D incentives, measures to protect intellectual property rights are important. To promote the utilization of patents leads to the creation of new industry. In the light of globalisation of economic activities, to promote standardisation from an international viewpoint is vitally important, especially to protect Japanese corporate products from infringement in Asian markets. The following measures will be implemented:-
- Setting up "Patent Market" especially for small and medium sized firms to activate distribution of about 100 thousand "cheap" patents which have not yet been commercialised (2.5M - 3.5M)
 - Promoting effective utilization of patent information, enabling access through internet (2.5M - 3.5M)
 - By the year 2000, granting patents more rapidly, aiming to complete the first examination within 12 months (0.1M - 0.2M)
 - Early protection of Japanese ITR overseas (2.5M - 3.5M)
 - A new project to review ITR protection system and its compatibility to international standards

4) Consolidating MITI Initiatives

- To provide more appropriate research environment in collaborating with university and industry, National Institute Advanced Industrial Science and Technology (AIST) one of the leading national institutes in advanced science research, will move to the "Science Science Park" (in Nagoya) by the end of FY1997 and a new laboratory called "Advanced Materials Computer Science Laboratory" will be built in the same compound.
- Building a high speed gigawatt-level AIST's eight laboratories in Tsukuba and to promote research cooperation through networks with other related national research institutes

5) Consolidating Intellectual Assets

- The state of Japanese bases for patentment research, experiment and evaluation provision of biological resources information, and the chemical safety database are behind compared to those of other advanced countries. Their rapid improvement is urgently needed.
- Support of Small and Medium sized Enterprises (SMEs)
 - Training personnel in support SMEs' manufacturing base in wider areas is important. They are a vital source of the nation's economic activity. Japan is becoming an ageing society and young people dislike working the manufacturing sector. For this reason, new measures are to be implemented, including setting up "regional manufacturing councils" with the cooperation of local government bodies and other training schemes.

- Schemes to support SMEs' R&D activities include i) new support for "System LSI Development" by SMEs and venture firms (0.3B¥), ii) 'Publicly invited proposal type' R&D scheme for SMEs (1.5B¥) and iii) an increase of subsidies for creative technology R&D projects (4.5B¥).

6. Energy and environmental preservation

To attain the target of reducing green house gas emission which Japan agreed at the Meteorological Change Framework Treaty Third Meeting (COP3) held in Kyoto last December, increased funds have been allocated to curb global warming:-

- New Sunshine Programme (covering the developments of alternative energy, energy conservation technology and environmental technology): 46.7B¥ +4.4%
Priorities are given to the R&D promotion of photovoltaic power generation system and high-performance lithium secondary batteries. Two new projects to start in FY1998 are i) "development of superconductance-applied basic technologies" and "development of ultralow loss devices" made of silicon carbide. A detailed budget of the New Sunshine Programme is Attachment 3-3.
- Strengthening measures for energy conservation and further promotion of development of new energy resources: 14.0B¥ +20%
- R&D projects to develop "immediate effect and innovative" technologies related to energy and environment: 1.7B¥ New

7. Technology development for environmental friendly society

To promote realisation of a smooth recycling system (such as glass and plastic products) and to promote more environmentally friendly corporate activities. New measures to create an environmentally harmonized economic society are:-

- Projects to develop technology relating to recycled products (0.3B¥ New)
- A new system to promote environmentally harmonised corporate activities (0.5B¥ New)

Yasuko Otsuka (Ms)

S&T Section 7 April 1998

Scheme to support SMEs' R&D activities include i) new support for "System LSI Development" by SMEs and venture firms (0.15%), ii) "Publicly invited proposal type" R&D scheme for SMEs (1.2%) and iii) an increase of subsidies for creative technology R&D projects (4.5%).

4. Energy and environmental preservation
To attain the target of reducing greenhouse gas emissions which Japan agreed at the Meteorological Change Framework Treaty Third Meeting (COP3) held in Kyoto last December, increased funds have been allocated to each global warming.

5. New Sunshine Programme (covering the development of alternative energy, energy conservation technology and environmental technology): 44.75% + 4.45%
Funds are given to the R&D promotion of photovoltaic power generation system and high performance lithium secondary batteries. Two new projects to start in FY1998 are i) "development of superconducting low-loss power transmission" and "development of window loss device" made of silicon carbide. A detailed budget of the New Sunshine Programme is Attachment 3-1.

6. Strengthened measures for energy conservation and further promotion of development of new energy resources: 14.05% + 2.05%
7. R&D projects to develop "breakthrough effect and innovative" technologies related to energy and environment: 1.15% New

8. Technology development for environment friendly society
To promote realization of a society recycling system (such as glass and plastic products) and to promote more environmentally friendly corporate activities. New measures to create an environmentally friendly business of economic society are:
9. Projects to develop technology relating to recycled products (0.15% New)
10. A new grant to promote environmentally friendly corporate activities (0.20% New)

Yoshi Ozeki (Min)
SAT Section 7 April 1998

Budget Request of Program for the Scientific Technology Development for Industries that Creates New Industries for FY1998 (million yen)

Theme	FY1997	FY1998
1. Program for the Scientific Technology Development for Industries that Creates New Industries	28,070	30,016
(1) R&D Projects in Cooperation with Academic Institutions	0	2,200
(2) R&D Project on Application of Industrial Technologies	0	2,100
National institutes for R&D Project (1) and (2)	0	100
(3) R&D Projects on New Industrial Science and Technology Frontiers	28,070	25,616
[Superconductivity]		
Superconducting Materials and Devices	2,982	0
[New Materials]		
Non-linear Materials	454	324
Silicon-Based Polymers	595	562
Synergy Ceramics	1,627	1,252
Technology for Novel High-Functional Materials	1,772	1,904
Super Metal Technology	600	1,077
Frontier Carbon Technology	0	1,488
[Biotechnology]		
Molecular Assemblies for a Functional Protein System	497	376
Production and Utilization Technologies of Complex Carbohydrates	644	587
Evolutionary Molecular Engineering	493	451
Bio-consortia Technology	1,763	1,685
Genome Informatics	0	1,505
[Electronics, Information and Communication]		
New Models for Software Architecture	393	0
Quantum Functional Devices	889	829
Ultimate Manipulation of Atoms and Molecules	2,661	2,589
Femtosecond Technology	1,506	1,781
Human Media Technology	224	454
[Machinery and Aerospace]		
Super/hyper-sonic Transport Propulsion System	3,705	3,067
Micromachine Technology	2,503	2,396
Advanced Photon Processing and Measurement Technologies	1,288	1,594
[Natural Resources]		
Basic Technology for Ocean Resources (Manganese Nodule Mining System)	1,435	0
[Human, Life and Society]		
Human Sensory Measurement Application Technology	1,678	1,365
[Leading Research]	302	279
Other costs	60	48
2. Support and Promotion of New Industries through Dissemination of Results from National Projects	0	200
3. Proposal-Based Creative R&D Promotion Program	1,500	1,414
TOTAL	29,570	31,629

ANNEX 2

Medical and Welfare R&D Projects FY1998

(million yen)

Theme	FY1997	FY1998
1. Project R&D	2, 0 7 8	2, 5 5 9
Microsampling and Microanalysis System Project	1 9 9	5 0 6
High Performance 3-D Imaging System for Medical Diagnosis Project	6 4 2	6 7 4
Less-Invasive Surgery Support System Project	3 3 4	3 9 4
Artificial Organs Project	2 7 0	3 4 5
Technical Aids for Self Sufficiency Project (Human-Friendly Care Equipment)	2 2 5	2 0 5
Technical Aids System for Home-Care Project	2 4 4	3 5 5
Esophageal Vocalization Aid System	7 0	1 8
Comprehensive Support System for Design and Operation of Wheelchairs	5 5	4 3
Survey on International R&D Cooperation in the Field of Medical and Welfare Equipment	1 0	1 0
Fundamental Research on Medical Equipment/Assisting Aids Technologies	2 9	9
2. "Welfare Techno-house" R&D	8 2 0	6 1 5
"Welfare-Techno System" R&D	5 2 0	6 1 5
"Welfare Techno-house" Development	3 0 0	0
3. Project for Promoting the Development of Practical Medical Welfare Equipment	1 9 0	1 9 8
4. Project for the Collection, Analysis and Distribution of Information on Medical Welfare Equipment	4 0	5 0
5. Expenditure for law enforcement (Law Concerning the Promotion of Research and Development and Diffusion of Social Welfare Equipment)	3	3
TOTAL	3, 1 3 1	3, 4 2 5

Medical and Welfare R&D Project FY1992

(million yen)

Theme	FY1992	FY1993
1. Project R&D	2,589	2,078
Microsampling and Microanalysis System Project	506	199
High Performance 3-D Imaging System for Medical Diagnosis Project	674	642
Less-Invasive Surgery Support System Project	394	384
Artificial Organ Project	343	270
Technical Aids for Self-Sufficiency Project (Human-Friendly Care Equipment)	202	222
Technical Aids System for Home-Care Project	328	244
Ecological Vocational Aid System	18	70
Comprehensive Support System for Design and Operation of Wheelchair	43	88
Survey on International R&D Cooperation in the Field of Medical and Welfare Equipment	10	10
Fundamental Research on Medical Equipment/Manufacturing Aids Technology	9	29
2. "Welfare Techno-Base" R&D	612	820
"Welfare Techno System" R&D	812	820
"Welfare Techno-Base" Development	0	300
3. Project for Promoting the Development of Practical Medical Welfare Equipment	198	180
4. Project for the Collection, Analysis and Distribution of Information on Medical Welfare Equipment	20	40
5. Experiments for New Instruments (New Concerning the Promotion of Research and Development and Division of Social Welfare Equipment)	2	2
TOTAL	3,428	3,121

Jan. 1998

Budget Request of New Sunshine Program for FY 1998

New Sunshine Program Promotion Headquarters,
Agency of Industrial Science and Technology, MITI

POINT

	[Unit: Million Yen]	
	FY 1998	(FY 1997)
1. New Sunshine Program, Overall		
Total New Sunshine Program Budget Demand	57,771	(56,320)
(Including Demands by Other Bureaus)		2.6% Increase
Amount Demanded by New Sunshine Program Promotion Headquarters	46,743	(44,763)
		4.4% Increase
2. Independent Projects		
* <u>Steadfast Implementation of Existing Projects</u>		
Photovoltaic Power generation System	7,561	(7,011)
Distributed Type Battery Power Storage System	2,907	(2,104)
, Etc.		
* <u>Implementation of New Projects</u>		
Development of Superconductance-Applied Basic Technologies	2,487	(0)
Development of Ultralow-Loss Power Devices	315	(0)
Basic Precursory Research on AC Superconductance-Applied Power Equipment	60	(0)
Precursory Research on MGC (Melt-Growth Composite Materials)		
Ultrahigh-Efficiency Turbine System	75	(0)
* <u>Advancement of Research on Innovative Global Environmental Technologies</u>		
Study of Environmental Assessment for CO2 Ocean Sequestration for Mitigation of Climate Change	1,438	(985)
, Etc.		
* <u>Research Relating to 15 Fields, Including Coping with COP3</u>		
Development of Immediate-Effect, Innovative Energy & Environmental Technologies	1,700	(0)
Expansion of System to Enlist Proposals for the Creation of New Industries	5,145	(4,700)
* <u>Development of Technologies Relating to New Recycled Products</u>		
(In Connection with Economic Structural Reform Special Adjustment Measure)		
Research on Immediate-Effect, Innovative Environment-Related Technologies	300	(0)

Jan 1998

Budget Request of New Sunshine Program for FY 1998

New Sunshine Program Promotion Headquarters
Agency of Industrial Science and Technology, MITI

POINT

[Unit: Million Yen]		FY 1998 (FY 1997)	
1. New Sunshine Program, Overall			
Total New Sunshine Program Budget Demand		27,771	(26,320)
(Including Demand by Other Bureau)		2,684	increase
Amount Demanded by New Sunshine Program		46,743	(44,763)
Promotion Headquarters		1,474	increase
2. Independent Projects			
* Research and Development of New Projects			
Photovoltaic Power Generation System		7,561	(5,641)
Windmill Type Battery Power Storage System		2,907	(2,104)
Etc.			
* Enhancement of Existing Projects			
Development of Superconducting-Applied Basic Technology		2,487	()
Development of Ultra-Low Power Devices		212	()
Basic Research on AC Superconducting-Applied Power Equipment		60	()
Primary Research on BEC (Bose-Einstein Condensate Materials)			
Ultra-High-Speed Hybrid System		72	()
* Advancement of Research on Innovative Fields			
Environmental Technology			
Study of Environmental Assessment for CO ₂ Green Separation		1,478	(982)
for Mitigation of Climate Change			
Etc.			
* Research Related to 11 Basic Research Groups with CO ₂			
Development of Innovative Basic Technology			
Energy & Environmental Technology		1,700	()
Expansion of System to Basic Research			
for the Creation of New Industries		2,143	(4,700)
* Development of Technology Related to New Industrial Projects			
(In Connection with Domestic Research Special Advancement Program)			
Research on Innovative Basic Technology			
Environment-Related Technology		300	()

New Sunshine Program in Fiscal Year 1998

1. Continued Implementation of Existing Projects Since FY 1993, R&D has been advanced in coordination to develop innovative technologies in connection with new energy resources, energy conservation and global environment preservation. Emphasis has been given primarily to the development of photovoltaic power generation systems and advanced battery power storage systems (high-performance lithium secondary batteries), and R&D projects have been advanced on integrated and coordinated technologies including the international clean system technology for hydrogen utilization (World Energy Network = WE-NET) and wide-area energy utilization network system (ECO Energy City Network System).

**Development of Photovoltaic Power Generation System*

The target is the development of low-cost, high-speed and high-efficiency module mass production technologies using amorphous solar cells.

**Development of Advanced Battery Power Storage System*

The aim is to develop technologies relating to lithium secondary batteries applicable to electric vehicles (EV) and home power storage systems.

**Advancement of Project to Develop International Clean System Technology for Hydrogen Utilization (WE-NET)*

Development of technologies for the conceptual designing of overall systems for hydrogen energy utilization, hydrogen manufacture and hydrogen transportation.

**Development of Wide-Area Energy Utilization System (ECO Energy City Network System)*

Intensification of research to achieve breakthroughs in the development of technologies relating to various fields in connection with energy recovery, transformation and transportation, with city and peripheral industrial facilities in perspective.

2. Implementation of New Projects

Regarding new projects, the following two themes were adopted subsequent to the preliminary evaluations conducted by the Planning and Systems Committee, Energy and Environmental Technology Development Sectional Meeting, Industrial Technology Inquiry Association. Also, regarding the precursory research system established in FY 1997, the following two themes were adopted through the same evaluation process. In FY 1998, the plan is to implement these new projects and precursory R&D projects.

(New Projects)

**Development of Superconductance-Applied Basic Technologies*

Research will be advanced to commercialize high-temperature superconductance wires and devices to improve the efficiencies of power system stabilization facilities and equipment.

**Development of Ultralow Loss Power Devices*

Research will be advanced to develop ultralow loss, high-speed power devices made of silicon carbide (SiC).

(New Precursory R&D Projects)

**Basic Precursory Research on AC Superconducting Power Equipment*

1. Continued implementation of Existing Projects Since FY 1991, R&D has been advanced in coordination to develop innovative technologies in connection with new energy resources, energy conservation and global environment preservation. Emphasis has been given primarily to the development of photovoltaic power generation systems and advanced battery power storage systems (high-performance lithium secondary batteries), and R&D projects have been advanced on integrated and coordinated technologies including the international clean system technology for hydrogen utilization (World Energy Network - WE-NET) and wide-area energy utilization network system (ECO Energy City Network System).

*Development of Photovoltaic Power Generation System
The target is the development of low-cost, high-speed and high-efficiency module mass production technologies using amorphous silicon cells.

*Development of Advanced Battery Power Storage System
The aim is to develop technologies relating to lithium secondary batteries applicable to electric vehicles (EV) and smart power storage systems.

*Advancement of Project to Develop International Clean System Technology for Hydrogen Utilization (WE-NET)

Development of technology for the conceptual design of a small system for hydrogen energy utilization, hydrogen transportation and hydrogen transportation.

*Development of Wide-Area Energy Utilization System (ECO Energy City Network System)
Introduction of research to achieve breakthroughs in the development of technologies relating to various fields in connection with energy storage, transmission and transportation, with city and regional industrial facilities in perspective.

2. Implementation of New Projects
Regarding new projects, the following two themes were adopted subsequent to the preliminary evaluation conducted by the Planning and Systems Committee, Energy and Environment Technology Development Section, Industrial Technology Agency, Association. Also, regarding the priority research system established in FY 1991, the following two themes were adopted through the same evaluation process in FY 1992, the plan is to implement these new projects and previously R&D projects.

(New Projects)

*Development of Environmentally-Friendly Basic Technologies
Research will be advanced to attain high-performance superconductance wires and devices to improve the efficiency of power system transmission facilities and equipment.

*Development of Compact Low Power Devices
Research will be advanced to develop ultra-low, high-speed power devices made of silicon carbide (SiC).

(New Priority R&D Projects)
*Basic Priority Research on AC Superconducting Power Equipment

Precursory R&D projects will be advanced to develop technologies to evaluate the energy conservation effects of AC superconducting power equipment and the stability improvement effects of power systems.

**Precursory Research on MGC Ultrahigh-Efficiency Turbine System Technology*

Precursory R&D projects will be advanced to develop a turbine system using MGC materials (molten growth composite materials) whose strengths are not deteriorated up to 1,800 °C.

3. Advancement of Research to Develop Revolutionary Global Environment Preservation Technologies

Breakthroughs with innovative technologies will be necessary in order to fundamentally resolve global meteorological change issues, so research will be intensified to develop technologies enabling the fixation and effective utilization of CO₂.

**Study of Environmental Assessment for CO₂ Ocean Sequestration for Mitigation of Climate Change*

Research will be advanced to develop technologies to evaluate the CO₂ isolation capacities of the seas, and technologies to forecast the environmental influences exerted on CO₂ release points and their peripheral regions.

**Development of Environmentally Harmonized Type Catalysts*

Basic technologies will be developed systematically in connection with catalysts to suppress the generation of the global hothouse effect gases, and technologies for the fixation of these gases.

4. Advancement of Research to Develop Immediate-Effect Energy- and Environment-Related Technologies (in Conformance with COP 3 and in Relation to the Creation of 15 Fields of New Industries)

Accelerating the development of technologies for energy conservation in all sectors of industry, civilian living and transportation will have the vitaleffect of hastening the fruitful completion of existing technology development projects, for which it will be necessary to advance new R&D projects to develop advanced immediate-effect energy- and onment-related technologies.

**Development of Immediate-Effect, Innovative Energy- and Environment-Related Technologies*

To resolve global environmental issues such as global warming, research will be advanced to develop immediate-effect energy- and environment-related technologies which can be anticipated to provide immediate and effective results.

**Expansion of System to Encourage Promising New Industry Creation Proposals*

Efforts will be continued and expanded to encourage promising new industry creation type proposals relating to the domains of energy and environment.

5. Advancement of Research to Develop Technologies to Realize An Environmentally Harmonized Type Economy and Society (Development of Technologies Relating to New Recycled Products)

Priority R&D projects will be advanced to develop technologies to evaluate the energy conservation effects of AC superconducting power equipment and the stability improvement effects of power systems.

*Priority Research on MFC (Metal-Fuel Cell) Technology
Priority R&D projects will be advanced to develop a turbine system using MFC materials (molten growth composite materials) whose strengths are not deteriorated up to 1,500°C.

1. Advancement of Research to Develop Revolutionary Global Environment Protection Technologies
Breakthroughs with innovative technologies will be necessary in order to fundamentally resolve global environmental change issues. Research will be intensified to develop technologies enabling the transition and effective utilization of CO₂.

*Study of Environment-Related Advancement for CO₂ Green Separation for Mitigation of Climate Change
Research will be advanced to develop technologies to evaluate the CO₂ isolation equipment of the sea, and technologies to forecast the environmental influence caused on CO₂ release points and their peripheral regions.

*Development of Environmentally Friendly Hydrogen Type Carbons
Basic technologies will be developed systematically in cooperation with industry to improve the generation of the global hydrogen effect gases, and technologies for the fixation of these gases.

4. Advancement of Research to Develop Innovative Energy- and Environment-Related Technologies for Contribution with CO₂ and in Relation to the Creation of a New Industry
Accelerating the development of technologies for energy conservation in all sectors of industry, civilian living and transportation will have the greatest effect of lowering the global completion of existing technology development projects. For which it will be necessary to advance new R&D projects to develop advanced innovative-effect energy- and environment-related technologies.

*Development of Innovative Energy- and Environment-Related Technologies
To resolve global environment-related issues such as global warming, research will be advanced to develop innovative-effect energy- and environment-related technologies which can be employed to provide innovative and efficient results.

*Expansion of System to Encourage Promoting New Industry Creation Projects
Efforts will be continued and expanded to encourage promoting new industry creation projects relating to the domain of energy and environment.

2. Advancement of Research to Develop Technologies to Realize An Environmentally Friendly (Low-Carbon) and Society (Transition of Technologies Relating to New Energy Products)

To respond to urgent social environmental issues such as resources recovery and recycling, research will be advanced to develop immediate-effect environment-related technologies which can be expected to provide immediate and effective results.

***Research to Develop Innovative Immediate-Effect Environment-Related Technologies (Related to Economic Structure Revision Special Adjustment Measure)**

In FY 1998, the plan is to promote the development of technologies conducive to these recycling systems since social demand is rising for the recovery and recycling of substances such as waste glass and used paper.

6. Promotion of Research Cooperation with Developing Countries (In Connection with ODA)
In order to reflect the results of R&D of the New Sunshine Program to research cooperation with developing countries, research cooperation with Indonesia in connection with the small-scale geothermal energy resources prospecting project that was started in FY 1997 will be continued.

	FY 1997 Budget	FY 1998 Budget
(1) Ceramic gas turbines	1,065	1,287
(2) Superconductance and other applied power technologies	2,728	2,168
(3) Superconductance-applied basic technologies (new technologies)	0	2,427
(4) Distributed type battery power storage technologies	2,104	2,907
(5) Wide-area energy utilization network system technologies (ECU energy city project)	1,630	1,351
(6) Hydrogen utilization international clean energy system technologies (WE-NET)	2,231	2,201
(7) Ultralow loss power devices technologies (new technologies)	0	313
(8) Preliminary research and development (AC superconducting power equipment basic technologies, MOC ultrahigh-efficiency turbine system technologies (new technologies))	300	471
(9) Immediate-effect, innovative energy- and environment-related technologies (new technologies)	0	1,700
(10) Others	6,733	6,343
(B) Environment		
(1) Global environment-related industrial technologies	9,528	9,593
(2) Immediate-effect, innovative environment-related technologies (new technologies) (Development of technologies as in connection with new recycled products)	0	300
System for Encouragement of New Industry Creation Proposals (Domain of energy- and environment-related technologies)	4,700	5,145
Research Cooperation to Promoted for Small-Scale Geothermal Power Generation Potentials in Remotely Inhabited Islands (ODA Technical Cooperation)	14	52

(The totals may not agree since the figures are given to the nearest integer values.)

To respond to urgent social environmental issues such as resource recovery and recycling, research will be advanced to develop immediate-effect environment-related technologies which can be expected to provide immediate and effective results.

*Research to Develop Innovative Immediate-Effect Environment-Related Technologies
(Related to Economic Growth and Environmental Adjustment Strategy)

In FY 1998, the plan is to promote the development of technologies conducive to these recycling systems since social demand is rising for the recovery and recycling of substances such as waste glass and waste paper.

6. Promotion of Research Cooperation with Developing Countries (in Connection with ODA)
In order to reflect the results of R&D of the New Sunlight Program to research cooperation with developing countries, research cooperation with Indonesia is conducted in connection with the small-scale geothermal energy resource prospecting project that was started in FY 1997 will be continued.

Table of FY 1998 Budget Request for New Sunshine Program

[Unit: Million Yen]

	FY 1997 Budget	FY 1998 Budget Demand
New Sunshine Program Total	56,320	57,771
(Re: Energy)		
(1) Solar energy technologies (including solar systems)	7,263	7,561
(2) Geothermal energy technologies	3,123	2,689
(3) Wind power energy technologies	476	410
(4) Coal energy technologies (liquefaction, hydro-gasification)	10,639	8,981
(5) Fuel cell power generation technology	5,480	4,688
(6) Ceramic gas turbine	1,965	1,297
(7) Superconductance and other applied power technologies	2,728	2,108
(8) Superconductance-applied basic technologies (new technologies)	0	2,487
(9) Distributed type battery power storage technologies	2,104	2,907
(10) Wide-area energy utilization network system technologies (ECO energy city project)	1,630	1,583
(11) Hydrogen utilization international clean energy system technologies (WE-NET)	2,231	2,203
(12) Ultralow loss power devices technologies (new technologies)	0	315
(13) Precursory research and development (AC superconducting power equipment basic technologies, MGC ultrahigh-efficiency turbine system technologies :new technologies)	300	471
(14) Immediate-effect, innovative energy- and environment-related technologies (new technologies)	0	1,700
(15) Others	6,753	6,245
(Re: Environment)		
(1) Global environment-related industrial technologies	9,628	9,595
(2) Immediate-effect, innovative environment-related technologies (new technologies) (Development of technologies as in connection with new recycled products)	0	300
System for Enlistment of New Industry Creation Proposals (Domain of energy- and environment-related technologies)	4,700	5,145
Research Cooperation to Prospect for Small-Scale Geothermal Power Generation Possibilities in Remotely Isolated Islands (ODA Technical Cooperation)	14	82

(The totals may not agree since the figures are given to the nearest integer values.)

Table of FY 1995 Budget Request for New Sunshine Program
[Unit: Million Yen]

New Sunshine Program Total		FY 1995 Budget	FY 1994 Budget
(1) Solar energy technologies (including solar systems)		2,361	2,361
(2) Geothermal energy technologies		2,123	2,123
(3) Wind power energy technologies		410	410
(4) Coal energy technologies (including hydro-gasification)		10,039	10,039
(5) Fuel cell power generation technology		2,430	2,430
(6) Ceramic gas turbines		1,962	1,962
(7) Supercritical and other applied power technologies		2,728	2,728
(8) Supercritical-applied basic technologies (new technologies)		0	0
(9) Distributed type battery power storage technologies		2,104	2,104
(10) Wide-area energy utilization network system technologies (LED energy city project)		1,620	1,620
(11) Hydrogen utilization international clean energy system technologies (WE-HET)		2,221	2,221
(12) Fusion low power device technologies (new technologies)		0	0
(13) Primary research and development (AC superconducting power equipment basic technologies, high-voltage efficient turbine system technologies, new technologies)		300	300
(14) Limited-effect, innovative energy- and environment-related technologies (new technologies)		0	0
(15) Other		6,252	6,252
(16) Engineering		0	0
(1) Global environment-related industrial technologies		0	0
(2) Innovative effect environment-related technologies (new technologies)		0	0
(3) Development of technologies as in connection with the energy strategy		0	0
System for promotion of low-carbon energy (Domain of energy- and environment-related technologies)		4,100	4,100
Research Cooperation to Promote for Small-Scale Geothermal Power Generation Facilities in Remotely Inhabited Islands (ODA Technical Cooperation)		14	14
Total		57,771	57,771

(The units may not agree with the figures are given to the nearest integer in 1000.)

Attachment 4 -Monbusho

A BRIEF NOTE ON MONBUSHO'S SCIENCE BUDGET FOR FY1998**Summary**

In the second year of implementing the Science and Technology Basic Plan, Monbusho's science budget for FY1998 will be used to further promote university research through the Grants-in-aid scheme, strategic competitive research by the Research for the Future Programme, realization of "10,000 post-doctor support scheme" as well as further up-grading inter-university information networking. A new research environment is gradually prevailing through the introduction of competitive research grants, contract researchers and evaluation systems. More substantial collaboration with industry is needed to realize technology transfer from university to industry. University research also needs to meet social and economic needs. In addition to existing university-industry collaboration schemes, the creation of "compass incubators" first at Tohoku University and Tokyo Institute of Technology will set be up in FY98. Proposed new initiatives include feasibility studies to set up two new research institutes; a "Global Environment Science Research Institute" and a "Computing Science Research Institute".

Major budget items**(1) Grants-in-Aid Programme**

117.9 billion yen (B¥) has been allocated to "Grants-in-Aid Programme", an increase of 5.1% (first single digit growth after successive double digit growth for past five years, but significant considering that the science and technology total budget sees only 1.0% growth in FY1998). By abolishing one existing category, 22B¥ has been allocated to a new category has been set up to undertake "exceptional promotions for the designated research areas" This change is to respond to the needs of creating new industries as well as to enhance the level of certain basic sciences. One example is a provision of a grant to human genomic research by Professor Sakaki of Tokyo University who is the leader of Japan's human genome research.

(2) Japan Society for the Promotion of Science (JSPS)

45B¥, an increase of 8.1%, has been allocated to strengthen the Japan Society for the Promotion of Science (JSPS) whose main roles are the provision of Monbusho fellowships, implementation of the "Research for the future" programme and promotion of international exchanges:

- To realize the "10,000 post doctoral fellowship programme by the year of 2000, 16.1B¥ has been allocated (+11.6%). The Monbusho schemes will accommodate about

A BRIEF NOTE ON MONBUSHO'S SCIENCE BUDGET FOR FY1998

Summary

In the second year of implementing the Science and Technology Basic Plan, Monbusho's science budget for FY1998 will be used to further promote university research through the Grants-in-Aid scheme, strategic competitive research by the Research for the Future Programme, realization of "10,000 post-doctoral support scheme", as well as further up-grading inter-university information networking. A new research environment is gradually prevailing through the introduction of competitive research grants, contract researchers and evaluation systems. More substantial collaboration with industry is needed to realize technology transfer from university to industry. University research also needs to meet social and economic needs in addition to existing university-industry collaboration between the creation of "company researchers" first at Tokyo University and Tokyo Institute of Technology will be up to FY98. Proposed new institutes include feasibility studies to set up two new research institutes, a "Global Environment Science Research Institute", and a "Computing Science Research Institute".

Detailed Budget Items

(1) Grants-in-Aid Programme
11.2 billion yen (FY) has been allocated to "Grants-in-Aid Programme", an increase of 2.1% (last fiscal year growth after successive double digit growth for past 5 years). But significant monitoring that the science and technology research budget was only 1.0% growth in FY1997. By shifting one existing category, 1.2% has been allocated to a new category but been set up to maintain "research programme for the designated research area". This change is to respond to the needs of cutting new research as well as to enhance the level of certain basic research. One example is a provision of a grant to human genetic research by Professor Shinko of Tokyo University who is the leader of Japan's human genome research.

(2) Japan Society for the Promotion of Science (JSPS)
4.8% an increase of 8.1% has been allocated strengthen the Japan Society for the Promotion of Science (JSPS) whose mandate for the promotion of Japanese international cooperation of the "Research for the Future" programme and promotion of international exchanges.

(3) To realize the "10,000 post-doctoral support programme by the year of 2000", 16.1% has been allocated (4.1%). The Monbusho science will concentrate more

6,130 post-doctoral fellows in FY1998. However, a Monbusho official says that the year of achieving the set-target is likely to be delayed.

- In the third year of "the Research for the Future Programme" (*Programme for the Promotion of Scientific Research with a view to Creating Future Intellectual Resources*), 21.8B¥ has been allocated (+5.83%) to enable to increase the number of projects from 220 to 246 projects.

(3) Research promotion of selected fields

Accelerator Science: 10.32B¥ has been allocated, an increase of 45.4%. Operation of "TRISTAN II" (B-factory) (whose construction started in 1994) will start in FY1998.

Space: 22.45B¥ has been allocated, an increase of 2.17%. The development of a lunar surface observation satellite called "SELENE" which is to be launched in 2003, has been undertaken jointly with NASDA. Basic R&D for the 22nd scientific satellite (SOLAR-B) and M-V rocket has also started.

Fusion research: 12.17B¥ has been allocated, a decrease of 33.21%, which is due to the completion of the Large Helical Device with a large scale superconductive helical coil at the National Institute for Fusion Science at Toki-city in Aichi prefecture after eight years investment.

Astronomical research: 3.80B¥ has been allocated, a decrease of 16.1%. It is due to the completion of the construction of a large-scale infrared telescope on Mt Mauna Kea, Hawaii.

Genomic science research: 3.16B¥ has been allocated, an increase of 29.6%. In response to the report by the Council for Science and Technology (July 1997) calling for further promotion of genomic and brain researchers, Monbusho now enhance human genome research through:-

- consolidating Human Genome Centre of Medical Research Institute of Tokyo University;
- setting up a new centre for research into genomic functions at Tokushima University;
- integrating researchers involving related wide areas through programmes of "Genome science", a grant in aid scheme and "Human genome" in JSPS's future research grant scheme; and
- Promotion of DNA Data Bank of Japan at the National Institute of Genetics.

(4) Consolidation of research supporting systems

3.84 B¥ has been allocated, an increase of 15.0%. This enables the numbers of research assistants to be increased from 2,405 to 2,562 and the number of technicians from 442 to 533

6,130 post-doctoral fellows in FY1998. However, a Japanese official says that the year of achieving the set-target is likely to be delayed.

- In the third year of "the Research for the Future Programme" (Programme for the Promotion of Scientific Research with a view to Creating Future Intellectual Resources), 11,894 has been allocated (+2,834) to enable to increase the number of projects from 320 to 346 projects.

(3) Research promotion of related fields

Accelerator Science: 10,128 has been allocated, an increase of 45,454. Operation of "TRISTAN II" (B-factory) (whose operation started in 1994) will start in FY1998.

Space: 12,439 has been allocated, an increase of 1,174. The development of a laser interferometer gravitational wave observatory called "SILEX" which is to be launched in 2001, has been undertaken jointly with NASA. Basic R&D for the 21st-century satellite (SOLAR-B) and M-V rocket has also started.

Energy research: 12,174 has been allocated, a decrease of 11,114, which is due to the completion of the large tokamak device with a large scale superconducting magnet coil at the National Institute for Fusion Science in Tokai city in April previous year.

Atomic nuclear energy: 1,608 has been allocated, a decrease of 12,194. It is due to the completion of the construction of a large-scale industrial reactor on the Mutsaers Island. However, the report by the Council for Science and Technology (July 1997) calling for further promotion of atomic and basic research, Matsuda gave advance human resource research strategy.

- Establishing Human Genome Centre at National Research Institute of Tokyo University.
- Setting up a new centre for research into genetic diseases at Tohoku University.
- Initiating researches involving related with some through programmes of "Genome Science", a grant in aid research and "Human Genome" in 1993's future research grant scheme and
- Promotion of DNA Data Bank of Japan at the National Institute of Genetics.

(4) Consolidation of research supporting systems

1,844 has been allocated, an increase of 12,074. This enables the number of research institutes to be increased from 1,402 to 1,522 and the number of researchers from 412 to 522.

and part-time researchers from 298 to 355.

(5) A scheme to allow more leadership

1.20B¥ has been allocated (an increase of 10.2%) for director generals of national inter-university research institutes (16) and research institutes attached to universities (62) to demonstrate their leadership in directing research programmes with their own initiatives and ideas.

(6) Enhancing science information infrastructure

39B¥ has been allocated, a decrease of 0.4%. It covers speeding up of both domestic science information networks (three university nodes to up-grade from current 6Mbps to 50Mbps) and international connections (with US to 150Mbps from current 45Mbps) as well as linking university and private sector's networks in order to promote scientific information exchange between university and industry (45Mbps). Further consolidation of multimedia "Electronic Libraries" and computer centre in universities is promoted. Tohoku University will build a university museum in FY1998 (after those of Tokyo University and Kyoto University).

(7) Collaboration between university and industry

106.51B¥ has been allocated, an increase of 5%. It covers joint research, commissioned research, donations to run courses and research, and establishing centres for cooperative research and the building of "campus incubators" (Tohoku University and Tokyo Institute of Technology in FY1998). Although the money flowing from industry to university has been sizable in the past, in terms of value for money, university's reputation as a business partnership has been low (i.e. firms donate money to establish links to recruit good researchers). For university to play an important role in the government campaign "generating new industry out of basic research", the problem is how to facilitate technology transfer from university to industry. Currently university researchers are finding their funding situation improving and it is interesting to see how quickly university researchers can change from being an academic to being an entrepreneur.

A LIST OF MONBUSHO MAJOR SCIENCE BUDGET ITEMS FOR FY1997

Unit: billion yen (B¥)

Item	FY97 Initial Budget	FY98 Budget	increase/ decrease
I. Increase of Grants-in-Aid Programme	112.20B¥	117.90B¥	+5.1%
II. Establishment of research bases	142.84	132.75	-7.1%
(1) Promoting Basic Research in Selected Fields	74.55	72.68	-2.50%
a) Feasibility studies for setting up:-			

and part-time researchers from 198 to 199.
(2) A scheme to allow more leadership

1.208% has been allocated (an increase of 10.3%) for director general of national science university research institutes (18) and research institutes attached to universities (63) to demonstrate their leadership in directing research programmes with their own initiatives and ideas.

(3) Enhancing science information infrastructure
398% has been allocated, a decrease of 0.4%. It covers speeding up of both domestic science information networks (three university nodes to up grade from current 60bps to 20Mbps) and international connections (with 12 to 15Mbps from current 4.5Mbps) as well as linking university and private sector's networks in order to promote scientific information exchange between university and industry (45Mbps). Further consolidation of nationwide "Electronic Libraries" and computer centre in universities is promoted. Tohoku University will build a university network in FY1998 (after start of Tohoku University and Kyoto University).

(4) Collaboration between university and industry
100.21% has been allocated, an increase of 5%. It covers joint research, environmental research, donations to two centres and research, and establishing centres for cooperative research and the building of "company laboratories" (Tohoku University and Tohoku Institute of Technology in FY1997). Although the money flowing from industry to university has been stable in the past, in terms of value for money, university's reputation as a business partnership has been low (as from other money to establish links to research good research). For university to play an important role in the government as a partner "promoting new industry and science research", the problem is now to facilitate technology transfer from university to industry. Current university researchers are facing their funding situation improving and it is believed to be how quickly university researchers can change from being an academic to being an entrepreneur.

A LIST OF MAJOR RESEARCH BUDGET ITEMS FOR FY1997

in billion yen (US\$)

Item	FY97 Initial Budget	FY97 Revised Budget	Change
1. Research of Comprehensive Programs	177,200	177,900	700
2. Large-scale research projects	177,200	177,900	700
(1) Promoting Basic Research in Selected Fields	70.33	71.62	1.29%
(2) Promoting research for cutting edge			

(i) "Global Environment Science Research Inst."	-	0.05	New
(ii) "Computing Science Research Institute"	-	0.02	New
b) Forming Center of Excellence (COE)	10.74	12.06	+12.3%
c) Astronomical Research, including the construction of large-scale infrared telescope on Mt. Mauna Kea, Hawaii	4.53	3.80	-16.1%
d) Accelerator Science, including building TRISTAN II (B-factory) at the High Energy Accelerator Research Organisation (KEK)	7.02	10.21	+45.4%
e) Space science, including construction of scientific satellites, M-V rockets, a lunar surface observation satellite (with NASDA) and No 22 scientific satellite (Solar-B)	21.97	22.45	+ 2.2%
f) Fusion Research, including the start of a new 'Large Helical Device' at the Fusion Science Research Institute	18.22	12.17	-33.2%
g) Prediction of Earthquakes & Volcanic Eruptions	3.12	2.74	-12.2%
h) Cancer and AIDS Research	4.85	4.84	-0.1%
i) Antarctic Research, implementing the 40th expedition	3.98	4.19	+5.3%
(2) Improvement of Research Environments	32.04	23.67	-26.1%
a) To increase research assistants	3.3	3.8	+15.0%
b) To support leadership by D-Gs of national inter-university research institutes and institutes attached to universities (78 in total)	1.1	1.2	+10.2%
c) Sophistication research facilities	27.6	18.6	- 32.5%
(3) Up-grading Science Information Infrastructure , to speed-up both domestic and international transmissions, a new installation of linkages between university and private research institutes, electronic libraries for multimedia, and consolidation of university computing centres.	36.24	36.39	+0.4
III. Strengthening of JSPS programmes	38.34	41.45	+8.1%
(1) Increase of JSPS Fellowships (realizing "10,000 post-doctoral fellow support plan")	14.39	16.07	+11.6%

(1) Global Environment Science Research	-	0.03	New
(2) Computing Science Research Institute	-	0.03	New
(3) Forming Center of Excellence (COE)	10.74	12.06	+12.3%
(4) Astronomical Research, including the construction of large-scale infrared telescope on Mt. Maun Kea, Hawaii	4.23	3.80	-10.1%
(5) Accelerator Science, including building TRISTAN II (R-Ring) at the High Energy Accelerator Research Organization (KEK)	7.02	10.21	+45.4%
(6) Space science, including construction of scientific satellite, M-V rocket, a lunar surface observation satellite (with NASA) and a 1.5 m scientific satellite (S-14-B)	11.97	22.42	+87.3%
(7) Fusion Research, including the start of a new 'Large Helical Device' at the Fusion Science Research Institute	10.32	12.17	+17.9%
(8) Prediction of Earthquake & Volcano	2.12	2.74	+29.2%
(9) Cancer and AIDS Research	4.77	4.94	+3.6%
(10) Atomic Research, including the 40th anniversary	2.92	4.19	+42.5%
(11) Improvement of Research Environment	22.04	23.07	+4.7%
(12) To increase research activities	2.3	2.8	+21.7%
(13) To support leadership by D-03 of national laboratories, research institutes and universities attached to universities (25 in total)	1.1	1.2	+9.1%
(14) Duplication research facilities	27.6	10.6	-61.2%
(15) Life-Grading Science Information	10.24	20.29	+97.1%
(16) To establish a new institution of higher education and private research institutes, closely related to university and research of university, research center	10.24	10.07	-1.7%
(17) Improvement of 1975 programme	14.39	10.07	-30.0%
(18) Increase of 1975 programme (during 1975-1980)	14.39	10.07	-30.0%

(2) "Research for future" programme	20.60	21.80	+5.8%
(3) International cooperation and exchange	3.35	3.58	+ 7.0%
IV. Promotion of University-Industry Cooperation	101.46	106.52	+5.0%
(1) Joint research with private sectors (from 1,336 projects with receiving 1,925 researchers to 1,488 projects and receiving 2,141 researchers)	5.54	6.13	+11.3%
(2) Commissioned research from industry	41.85	45.63	+9.0%
(3) Accommodating commissioned researchers from industry to enhance their research quality	1.1 2	1.14	0
(4) Donations (51 courses and 17 research divisions) will be run at 28 universities in FY1998 by donations from industry	52.78	52.78	0
(5) Joint research centres (at 51 universities) and building two "campus incubations"(new) to transfer university research results to industries	0.2	0.84	+321%

Yasuko Otsuka (Ms), S&T Section

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(2) "Research for future" programme	20.60	21.80	+2.20%
(3) International cooperation and exchange	3.32	3.38	+7.0%
IV. Promotion of University-Industry Cooperation	101.46	106.32	+2.8%
(1) Joint research with private sectors (from 1,336 projects with receiving 1,825 researchers to 1,478 projects and receiving 2,141 researchers)	2.24	6.13	+11.3%
(2) Commissioned research from industry	41.82	42.62	+2.0%
(3) Accommodating commissioned researchers from industry to enhance their research quality	1.12	1.14	0
(4) Donations (25 donors and 12 research divisions) will be run at 25 universities in FY1998 by donations from industry	22.78	22.78	0
(5) Joint research course (at 21 universities) and leading two "company incubators" (new) to transfer university research results to industries	0.2	0.84	+121%

Yoshio (Yoshi) (2nd) SAT Section

11/2/98