

## The Trend of the R&D Policy in the U S

### — Transition of priority areas

### in the R&D budget allocation of the federal government —

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#### 7.1 Introduction

On January 10, 2002, President Bush signed all the appropriation bills for fiscal 2002, and, subsequently, the government budget for fiscal 2002 was approved. The government budget for fiscal 2002 was fixed after 3 months elapsed from the commencement of fiscal 2002 on October 1, 2001. On February 4, 2002, the President announced the Budget Message (the budget compilation policy to be delivered by the President to Congress) for fiscal 2003.

In this report, we analyze the characteristics of the R&D budget in the government budget for fiscal 2002 (from October 2001 to September 2002) and the Budget Message for fiscal 2003, and then review the trend of the R&D policy of the U S government.

#### 7.2 Budget compilation system in the U S

The government budget in the U S is composed of; (1) the discretionary budget requiring legislation in accordance with the appropriation act, and (2) the obligative budget that can be renewed automatically once it has been approved in accordance with the authorization act. The governmental R&D budget is included in the discretionary budget and will be finalized in the budget compilation process shown in Table 1.

#### 7.3 Transition of the governmental R&D budgets

The transition of the governmental R&D budgets for the past 20 years is shown in Figure 1.

The governmental budgets increased significantly in fiscal 2002 and 2003. The reason is because of the drastic increase in the R&D budget for countermeasures against terrorism, due to the influence of the simultaneous multiple terrorist attacks against the US on September 11, 2001, and the increase of R&D investments as a stimulant for the recession.

#### 7.4 The governmental R&D budget for fiscal 2002

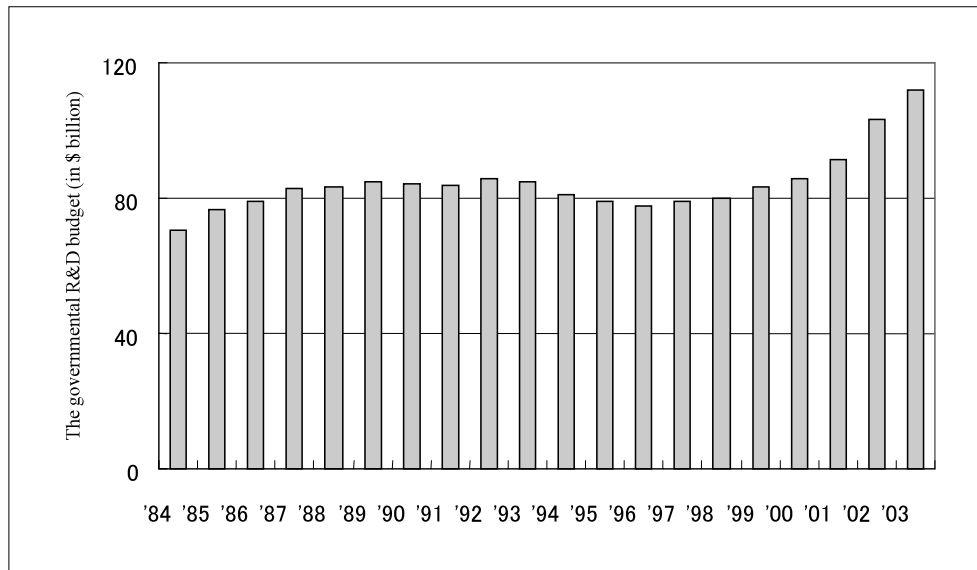
##### 7.4.1 Outlines of the governmental R&D budget for fiscal 2002

As for the governmental R&D budget for fiscal 2002, the breakdown by institute is shown in Figure 2, and their increasing rates from the previous year by institute are shown in Figure 3,

**Table 1:** The compilation process of the discretionary budget in the US.

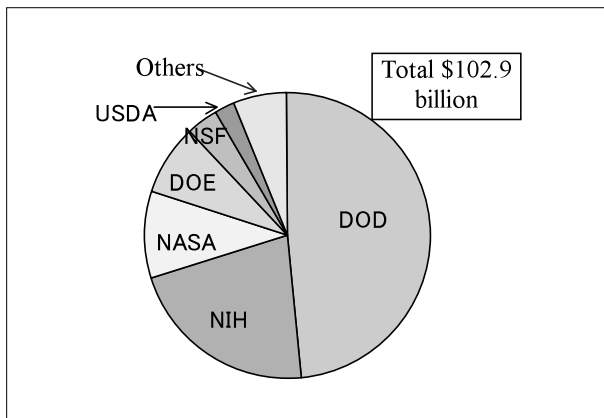
Time	Description
In early February	The President delivers the Budget Message to Congress.
From mid-February to the end of September ↓	Deliberations in Congress
	Congress submits the appropriation bill to the President.
	The President signs the bill.*
	The budget is approved.
October 1	New fiscal year starts.

\* When the President does not sign the appropriation bill, the bill can be approved if more than 2/3 of Congress vote in favor of it.

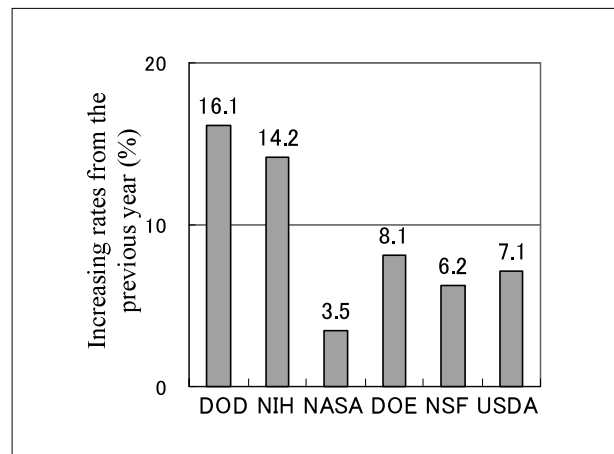
**Figure 1:** Transition of the governmental R&D budgets

\* The figure for fiscal 2003 is the R&D budget in the Budget Message

Source: Document released by OMB (Office of Management and Budget)

**Figure 2:** R&D budget for fiscal 2002 by institute

Source: Data provided by AAAS  
(R&D Budget and Policy Program)

**Figure 3:** Increasing rates from the previous year of R&D budgets by institute for fiscal 2002

Source: Data provided by AAAS  
(R&D Budget and Policy Program)

respectively.

#### 7.4.2 Characters of the R&D budget for 2002 by institute

##### (1) DOD

The R&D budget of the DOD (Department of Defense) for fiscal 2002 increased by 16.1% from the previous year. This is the biggest rate of increase for the past 20 years. As a background to this, there are the drastic increase of the R&D budget related to the development of the missile defense system, which is one of the most important issues of the Bush Administration, and the drastic increase of the R&D budget for countermeasures against terrorism due to the influence of the simultaneous multiple terrorist attacks against the U.S.

##### (2) NIH

The R&D budget of the NIH (National Institutes of Health) for fiscal 2002 increased by 14.2% from the previous year. The reason is because the budget increased as a part of the NIH's budget doubling campaign (a 5-year campaign started from fiscal 1999) and the R&D budget for countermeasures against terrorism increased significantly due to the influence of the simultaneous multiple terrorist attacks against the U.S.

##### (3) NASA

The R&D budget of NASA (National Aeronautics and Space Administration) for fiscal 2002 increased by 3.5% from the previous year. The

reason is because the R&D budget required for improving the security of NASA's facilities was newly appropriated due to the influence of the simultaneous multiple terrorist attacks against the US. The R&D budget of ISS (International Space Station) for fiscal 2002 decreased from the previous year. While, the research costs for biology and physics increased.

#### (4) DOE

The R&D budget of the DOE (Department of Energy) for fiscal 2002 increased by 8.1% from the previous year. The reason is because activities for developing weapons against terrorism targeting nuclear facilities were strengthened after the simultaneous multiple terrorist attacks against the US. As a result of this, the DOE's R&D budget related to national defense increased significantly, while the R&D budget related to the energy field and the budget related to science stayed almost the same as in the previous fiscal year.

#### (5) NSF

The R&D budget of the NSF (National Science Foundation) for fiscal 2002 increased by 6.2% from the previous year. The reason is because the respective R&D budgets of the NSF for the cross-departments type Nanoscale Science, Engineering, and Technology Initiative and the US. Global Change Research Program increased significantly due to the influence of the simultaneous multiple terrorist attacks against the US. The fact that the competitive funds to be supplied to researchers from the USDA increased significantly upon strong request from Congress also influenced this increase of the R&D budget of the USDA.

#### (6) USDA

The R&D budget of the USDA (United States Department of Agriculture) for fiscal 2002 increased by 7.1% from the previous year. The reason is because research activities related to the security of food and researches against terrorism targeting the food supply system were strengthened. And the fact that the competitive funds to be supplied to researchers from the USDA increased significantly upon strong request of Congress also influenced the increase of the R&D budget of the USDA.

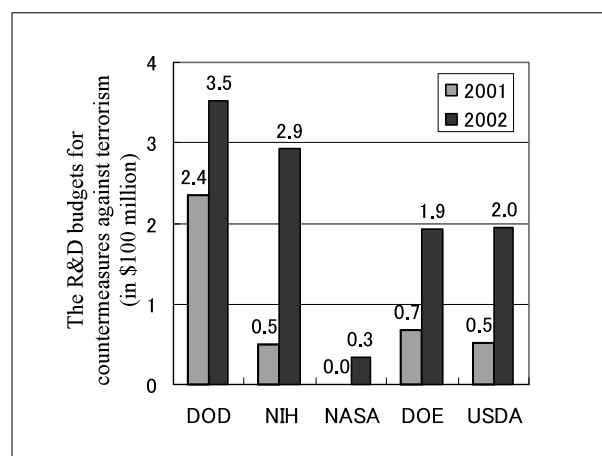
### 7.4.3 The R&D budget for countermeasures against terrorism

In this section, we analyze the R&D budget for countermeasures against terrorism, which strongly influenced the governmental R&D budget for fiscal 2002. While the R&D budget for countermeasures against terrorism for fiscal 2001 was \$580 million, the same budget in the President's Budget Message for fiscal 2002 decreased to \$560 million. However, after the simultaneous multiple terrorist attacks against the US., the President and Congress decided to disburse \$400 million of the budget for countermeasures against terrorism immediately. Consequently, a part of this budget was appropriated in the R&D budget for countermeasures against terrorism for fiscal 2002, and, as a result, the R&D budget for countermeasures against terrorism for 2002 increased significantly in the end to \$1.5 billion.

The R&D budgets for countermeasures against terrorism for fiscal 2001 and 2002 by institute are shown in Figure 4. In all institutes, the R&D budgets for countermeasures against terrorism for fiscal 2002 increased significantly from the budgets for fiscal 2001.

As for the R&D budgets for countermeasures against terrorism added to the budget for fiscal 2002, some of them are to be disbursed only for this year and the others will be disbursed

**Figure 4:** The R&D budgets for countermeasures against terrorism by institute



\* The R&D budget of NASA for countermeasures against terrorism for fiscal 2001 was zero. The R&D budgets of the NSF for countermeasures against terrorism for both fiscal 2001 and 2002 were zero.

Source: AAAS Special Report on Counter - Terrorism R&D.

continuously in the future. Although it was unknown whether the budget for countermeasures against terrorism would be disbursed continuously or not at the time when the budget for fiscal 2002 was approved, we can analogize the future directions of the budget for countermeasures against terrorism from the President's Budget Message for fiscal 2003 as mentioned below.

#### 7.4.4 Comparison with the President's Budget Message for fiscal 2002

The increasing rates of the governmental R&D budgets from the previous year, which the President submitted in the Budget Message before the simultaneous multiple terrorist attacks against the US, are shown in Figure 5.

In the Budget Message for fiscal 2002, the R&D budgets for both the DOD and the NIH increased by more than 10% from fiscal 2001, while the R&D budgets for other institutes were the same or decreased from fiscal 2001.

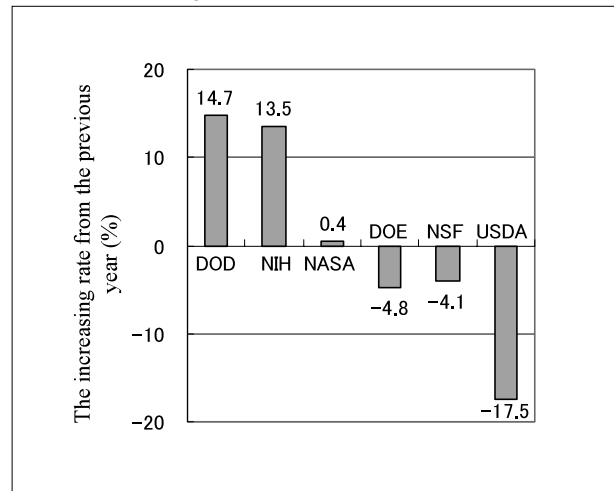
The budgets of the DOD and the NIH increased since President Bush publicly pledged to actively support these institutes during the presidential election.

On the other hand, the R&D budgets of institutes other than the DOD and the NIH decreased since the President, planning to strongly reduce taxes over 10 years, had no margin to increase the R&D budgets for these institutes. The stance of President Bush is in contrast to the stance of President Clinton, who actively increased the R&D budgets of the DOE, the NSF and the USDA.

#### 7.4.5 Influences of the simultaneous multiple terrorist attacks against the US on the governmental R&D budget for fiscal 2002

How did the simultaneous multiple terrorist attacks against the US influence the R&D budget of the U.S. government? The R&D budgets for other than countermeasures against terrorism have also increased as well as the budget for countermeasures against terrorism increased significantly. As an example of the former, we can cite the fact that the R&D budget of the NSF, not

**Figure 5:** The increasing rates from the previous year of the R&D budgets by institute in the Budget Message for fiscal 2002



Source: AAAS Analysis of R&D in the FY 2002 Budget.

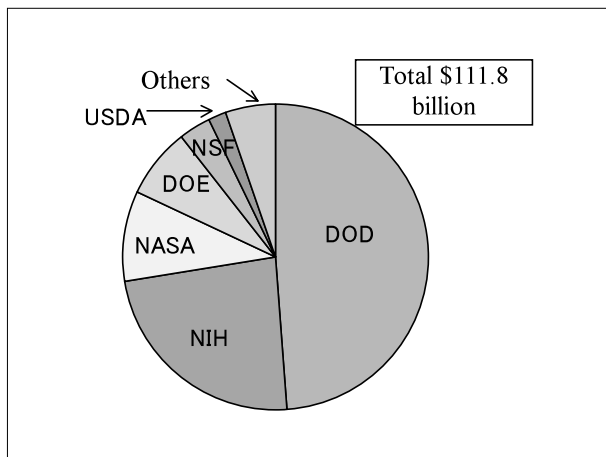
having an R&D budget for countermeasures against terrorism, finally increased.

The national finance of the US, which had been in the black for 4 years since 1998, will fall into the red in fiscal 2002. This is a big change because an accumulated black ink balance of \$5.6 trillion was expected for 10 years since 2002 in the Budget Message for fiscal 2002. However, both the President and Congress recognized that the nation will be in a state of emergency in fiscal 2002, suffering from the influences of the simultaneous multiple terrorist attacks against the U.S., and agreed to actively support R&D even if the national finance falls into the red.

### 7.5 The President's draft of the governmental R&D budget for fiscal 2003

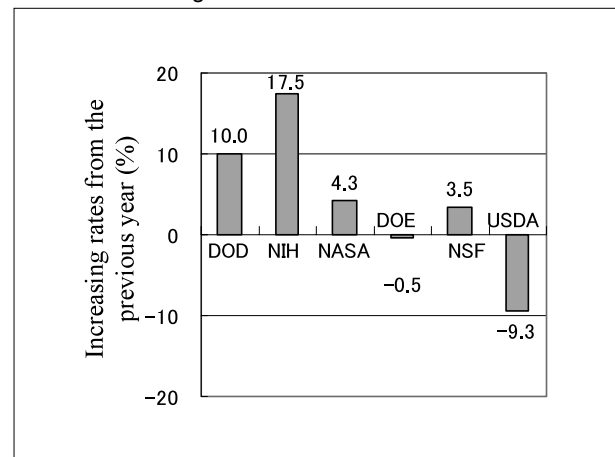
The R&D budgets by institute in the Budget Message for fiscal 2003 are shown in Figure 6, and the increasing rates of the budgets by institute from the previous year are shown in Figure 7, respectively. In the Budget Message for fiscal 2003, the R&D budget is \$111.8 billion, which is an increase of 8.7% from the approved budget of the previous year. As a background to this, there is an intention on the part of the President to accept a red ink balance in fiscal 2003, continuously from the budget for fiscal 2002, and to actively support R&D.

**Figure 6:** R&D budget by institute in the Budget Message for 2003



Source: Data provided by AAAS  
(R&D Budget and Policy Program)

**Figure 7:** Increasing rates from the previous year of the R&D budgets by institute in the Budget Message for 2003



Source: Data provided by AAAS  
(R&D Budget and Policy Program)

### 7.5.1 Characteristics of the R&D budgets by institute in the Budget Message for 2003

#### (1) DOD

The R&D budget of the DOD increased by 10.0% from the previous year in the Budget Message for fiscal 2003. The reason is because the budget for developing weapon systems has been drastically increased. On the other hand, the budgets for general researches and technology development for other than weapons decreased from the previous year.

#### (2) NIH

The R&D budget of the NIH increased by 17.5% from the previous year in the Budget Message for fiscal 2003. As a background to this, there is the fact that fiscal 2003 will be the last year of the 5-year campaign for doubling the NIH's budget, and the entire budget of the NIH has increased drastically in order to maintain the commitment to the public. Among the institutes under the NIH, the budgets of the NIAID (National Institute of Allergy and Infectious Diseases) and the NCI (National Cancer Institute) have increased drastically in particular.

Since the NIAID leads in the development of countermeasures against bio terrorism in the NIH, the R&D budget for countermeasures against bio terrorism of the NIAID increased by 57.3% from the previous year. The NIAID is also an institute leading research activities on AIDS, which the Bush Administration attaches importance to, and

the budget for researching on AIDS was also increased by 10%.

In the same way, for the research activities on cancer, which the Bush Administration also attaches importance to, the budget for researching on cancer of the NCI representing the NIH increased to \$4.7 billion, which represents an increase of 12.2% from the previous year.

#### (3) NASA

The R&D budget of NASA increased by 4.3% from the previous year in the Budget Message for fiscal 2003. As a background to this, there is the fact that the R&D budget of the SAT (Science, Aeronautics and Technology) program and the funds for space science research activities have increased drastically. The funds for the BPR (Biological and Physical Research) have increased in particular. On the other hand, the budget of the manned space flight programs including the ISS (International Space Station) plan decreased from the previous year.

#### (4) DOE

The R&D budget of the DOE decreased by 0.5% from the previous year in the Budget Message for fiscal 2003. There is the influence of the fact that the R&D budget related to national defense, which increased in fiscal 2002 due to the influence of the simultaneous multiple terrorist attacks against the U.S., decreased in the Budget Message for fiscal 2003. It influences significantly that the budget for developing weapons, which had been added to

the budget for 2002 as a budget for countermeasures against terrorism, has not been appropriated to the budget for fiscal 2003. However, among the R&D activities related to the national defense of the DOE, the R&D budgets for the advanced science-computing program and research activities related to nuclear weapons have increased.

For the R&D budgets related to science, the budgets for physics research, fundamental energy research and computing, etc., have increased. However the entire budget related to science is almost equivalent to the previous year in general, since the budget for the project developing the spallation neutron source facility was decreased.

The R&D budgets related to energy have decreased slightly. In these R&D budgets, the priority is shifting from natural gas or petroleum to clean coal. And it is also characteristic that the priorities in the DOE are shifting from the PNGV (Partnership for a New Generation of Vehicles) developing vehicles with high petrol consumption efficiencies, to the FreedomCAR project, which is the joint development of vehicles using fuel cells between the government and the automobile industry in the U.S.

#### **(5) NSF**

The R&D budget of the NSF increased by 3.5% from the previous year in the Budget Message for fiscal 2003. There is the significant influence of the fact that the NSF obtained the earth science research program from the DOC (Department of Commerce), the hydrology research program from the DOI (Department of Interior) and the environment science technology R&D from the EPA (Environmental Protection Agency), respectively.

In addition, drastic increases of the budgets for mathematic research and IT research also contribute to the increase of the R&D budget of the NSF.

#### **(6) USDA**

The R&D budget of the USDA decreased by 9.3% from the previous year in the Budget Message for fiscal 2003. The reason is because the budgets of research activities related to food security, which had been added to the budget for fiscal 2002 as an

influence of the simultaneous multiple terrorist attacks against the U. S., and countermeasures against terrorism targeting the food supply system are not appropriated in the Budget Message for fiscal 2003.

#### *7.5.2 Foresights of deliberations related to the governmental R&D budget for fiscal 2003 in Congress*

Since the importance of countermeasures against terrorism and territory defense has currently been raised as an influence of the simultaneous multiple terrorist attacks against the U. S., it is highly expected that the R&D budget of the DOD, which has increased from the previous year in the Budget Message for fiscal 2003, will be approved by Congress. Furthermore, since Congress will be going through elections races in November 2002, it is highly expected that Congress will approve increasing the budget of the NIH, for which national support can be easily obtained. Since the budgets of the DOD and the NIH account for about 3/4 of the governmental R&D budget, it is expected that the entire governmental R&D budget for fiscal 2003 will increase from the previous year.

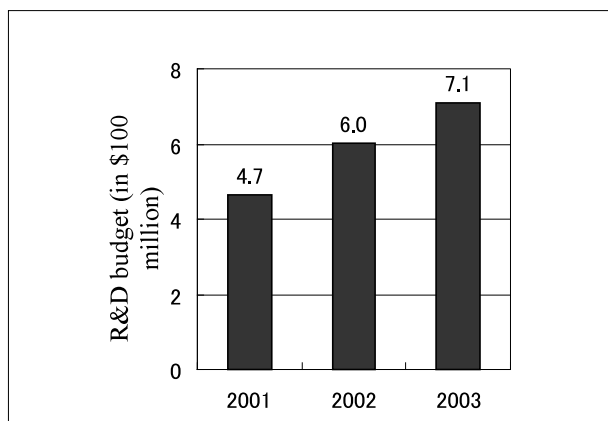
Many congressional members of the Democratic Party feel that the R&D budget in the Budget Message must be increased more and the R&D required for countermeasures against terrorism and boosting the economy must be properly executed. On the other hand, some the conservatives of the Republican Party have the opinion that the entire discretionary budget including the R&D budget must be squeezed in consideration of the large-scaled tax reduction and the economic recession.

Since Congress, with elections ahead, shows a marked trend toward increasing the budget, there is a high possibility that the governmental R&D budget for fiscal 2003 will exceed the Budget Message.

### **7.6 Interdepartment program**

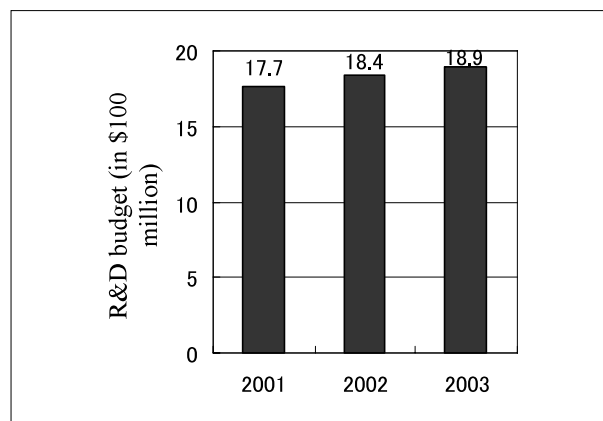
Transitions of the R&D budgets of the interdepartments type initiatives such as NNI (Nanoscale Science, Engineering, and Technology Initiative), NITR&D (Networking and Information

**Figure 8:** Transition of the budget of NNI



Source: Data provided by AAAS (R&D Budget and Policy Program)

**Figure 9:** Transition of the budget of NITR&D

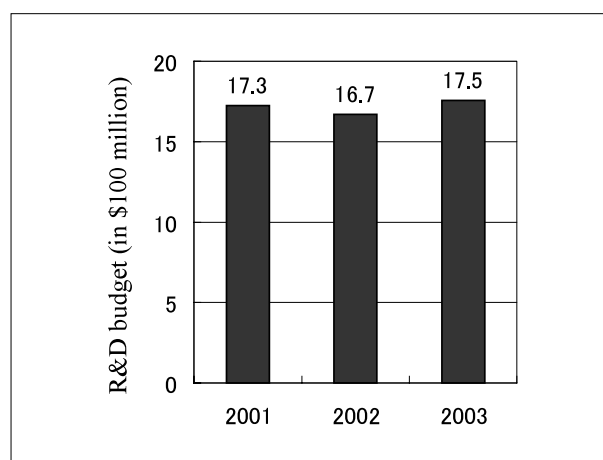


Source: Data provided by AAAS (R&D Budget and Policy Program)

Technology R&D initiative) and USGCRP (U. S. Global Change Research Program) are shown in Figure 8 to 10, respectively.

The R&D budget of NNI has increased constantly. The R&D budgets of NITR&D and USGCRP have showed a trend toward increasing. The reason why the R&D budget of USGCRP for fiscal 2002 decreased from the budget for fiscal 2001 is that the R&D budget of NASA, taking charge of a major part of the program, was decreased.

**Figure 10:** Transition of the budget of USGCRP



Source: Data provided by AAAS (R&D Budget and Policy Program)

## 7.7 Conclusion

The governmental R&D budget has showed a trend toward increasing. In particular, the R&D budgets of the DOD and the NIH, accounting for 3/4 of the entire budget, have increased significantly. It is expected that both the President and Congress will actively support R&D and accept a red ink balance in the national finance. The governmental R&D budget will in general continue to increase as importance is attached to R&D for countermeasures against terrorism and

R&D for boosting the economy.

## Acknowledgements

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