

JAPAN

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In December 2009, Japanese new cabinet led by Prime Minister Dr. Hatoyama decided the first budget (FY2010, governmental plan). The outline of FY2010 science and technology budget and the background of budget are described here. Finally, several implications, especially for Korean readers, are introduced.

1. Japan's Science and Technology Budget

1.1 Overview

1.1.1 FY2010 Governmental S&T Budget (planned)

In FY2010, the S&T budget of Japanese Government in FY2010 is 3,572 billion Yen (= 42,864 billion Won, when 1Yen=12Won). About two-thirds (65.0%) of the total S&T budget is allocated to *Ministry of Education, Culture, Sports, Science and Technology* (MEXT) which is mainly responsible for basic sciences, fundamental R&D and big sciences. Other than MEXT, 15.1% is allocated to *Ministry of Economy, Trade and Industry* (METI), 4.8% is to Ministry of Defense (MOD), 4.3% is to Ministry of Health, Labor and Welfare (MHLW), 3.5 % is to *Ministry of Agriculture, Forestry and Fisheries* (MAFF).

In Korea, at the same time, the R&D budget of Korean Government in FY2010 is 13,640 billion Won.

38.4% of them is allocated to *Ministry of Knowledge Economy* (MKE) and to *Small & Medium Business Administration* (SMBA) (the aggregated role of MKE and SMBA is similar to the role of METI). 31.9 % is allocated to *Ministry of Education, Science and Technology* (MEST), 13.2% is to *Defense Acquisition Program Administration* (DAPA).

Comparing to the R&D budget of Korea, you can easily find that Japanese budget has mainly three features; (1) basic and fundamental R&D is well funded, (2) governmental expenditure for industrial technology is small, (3) the portion of defense R&D budget is “very” small.

1.1.2 Time-trend of S&T budget

Japan's S&T budget in FY2010 shows 0.8% increase from FY2009. Over last 10 years, the total scale of S&T budget was quite stable in spite that the governmental budget was severely reduced in many areas other than S&T.

1.2 Highlights of FY2010 S&T Budget

1.2.1 MEXT Budget

MEXT's S&T budget in FY2010 focused on “green innovation” and “basic sciences”. While the total amount of S&T budget is stable, the budget in these areas rapidly increased based upon the “selection & focus” principle.

Table 1 FY2010 Governmental S&T Budget – Japan and Korea

JAPAN Ministries	FY2010 [bilYen](a)	portion [%]	FY2010 [bil Won]	portion [%]	KOREA Ministries
MEXT (Education, Culture, Sports, Science & Technology)	2,324	65.1%	4,356	31.9%	MEST (Education, Science & Tech)
METI (Economy, Trade & Industry)	539	15.1%	4,967	36.4%	MKE+SMBA (Economy)
Defence	171	4.8%	1,796	13.2%	DAPA (Defence)
Health, Welfare & Labor	154	4.3%	308	2.3%	Health & Welfare
Agriculture, Fishery & Forest	124	3.5%	236	1.7%	Agriculture, Fishery & Food
Others	260	7.3%	1,977	14.5%	Others
JPN Gov. Total	3,572	100%	13,640	100%	KOR Gov. Total

Source for Japan: “FY2010 Governmental S&T Budget (planned)”, Office of Science and Technology (S&T), Cabinet Office (CAO) (press release on Jan 07, 2010)

Source for Korea: Document of National S&T Committee on Nov 24, 2009

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Table 2 10-years trend of S&T Budget in Japan

Unit: billion Yen	Budget at the beginning of Fiscal Year									
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
S&T Budget Total	3,469	3,544	3,597	3,608	3,578	3,574	3,511	3,571	3,544	3,572
- S&T Promotion Cost	1,121	1,183	1,230	1,284	1,317	1,331	1,348	1,383	1,378	1,332

Note: S&T Promotion Cost is a part of S&T Budget. The cost is defined as “cost whose main objective is the promotion of S&T”

- R&D towards Green Innovation
 - Budget: 9.8 billion Yen in FY2010 (3.7 billion Yen in FY2009)
 - Major items: Low-carbon cutting-edge technology development (2.5 billion Yen, new), Research on climate change adaptation strategy (development of platform for the collection & analysis of observation data) (1.6 billion Yen, new), Research on social scenario towards low-carbon society (0.3 billion Yen, new)
- Basic Sciences
 - Budget: 341.1 billion Yen in FY2010 (293.8 billion Yen in FY2009)
 - Major items: High performance computing infrastructure (22.8 billion Yen in FY2010 ← 19.0 billion Yen in FY2009), Cutting-edge R&D strategic fund (incl. fund for female and young researchers) (40 billion Yen, new)

1.2.2 METI Budget

METI's S&T budget in FY2010 also focused on “green innovation” related items as following:

- Development of Energy-saving Semi-conductor
 - Budget: 2.0 billion Yen in FY2010 (new)
 - Major items: R&D on SiC semi-conductor (energy loss under 1/100, comparing with Si semi-conductor)
- Development of Super Light & High Tensile Strength Material
 - Budget: 1.5 billion Yen in FY2010 (new)
 - Major items: R&D on the fusion material combined by the carbon nano-tube (CNT) and the existing materials.

2. Situation around Japan's S&T Budget

In Japan, new government led by Prime Minister Dr. Yukio HATOYAMA (Democratic Party of Japan:

DPJ) launched on September 16, 2009. Hatoyama cabinet introduced new policy approaches different from the former Liberal Democratic Party (LDP)-led government. Major events which might affect on the FY2010 S&T budget was as following.

2.1 Key Ministers in Hatoyama Cabinet

At first, it is interesting to see that the key ministers in Hatoyama Cabinet, including Prime Minister himself, have S&T backgrounds. Dr. Hatoyama is the first doctor-holder Prime Minister from S&T field.

< Key ministers who have S&T background >

Dr. Yukio HATOYAMA, Prime Minister, graduated from Engineering Department, the University of Tokyo. He got the doctor degree from Stanford University in US. He had job experiences as researcher in Tokyo Institute of Technology and as associate professor in Sensyu University in Japan.

Mr. Naoto KAN, Vice Prime Minister and Minister of Finance, graduated from Physics Department in Tokyo Institute of Technology. He had worked as a patent lawyer (attorney). Until the beginning of January, 2010, his post was Vice Prime Minister, Minister of State for National Strategy and Minister of State for Science and Technology Policy.

Mr. Tatsuo KAWABATA, Minister of Education, Culture, Sports, Science and Technology and Minister of State for Science and Technology Policy, graduated from Engineering Department, Kyoto University. He had worked as a researcher in Toray Co.

Mr. Hirobumi HIRANO, Chief Cabinet Secretary, graduated from Engineering Department, Chuo University and had worked for Panasonic Co.

2.2 UN Summit on Climate Change

The first appearance of Prime Minister Hatoyama in

diplomatic circle was UN Summit on Climate Change on September 22, 2009, at the NY headquarter of UN. In his speech, he expressed the strong message to the rest of world, that is, “*Japan will aim to reduce its (green house gas) emissions by 25% by 2020, if compared to the 1990 level, consistent with what the science calls for in order to halt global warming.*” This target looks so ambitious, when we recall the target by Korean Government. Current Korean target is to reduce its emissions by 4% by 2020 if compared to the 2005 level, in other words, to permit 91% increase of its emission from 1990 to 2020. (Note: CO₂ emission per capita in 2007 [IEA, 2009] Japan: 9.68 ton-CO₂ (the 12th large among OECD 30 countries), Korea: 10.09 ton-CO₂ (the 9th large))

In order to realize this emission target, Hatoyama Cabinet put high priority on green innovation. Soon after the UN Summit, Vice Prime Minister and Minister of State for S&T Policy, Mr. Naoto KAN, expressed the vision of green innovation in STS *forum* in Kyoto on October 04. Concrete actions followed in “*New Growth Strategy*” as mentioned below.

2.3 Budget Screening by Cabinet Secretariat

Government Revitalization Unit in Cabinet Secretariat, which is newly established section in Hatoyama government, hold a series of “*Budget Screening*” (*jigyoushiwake* in Japanese) meetings from November 11 to November 27, 2009. All of the meetings were open to public and broadcasted on live. These meetings attracted huge public interests for its “open” approach.

S&T budget was also included in agenda items of “*Budget Screening*”, and was basically evaluated in a negative direction. For example, at the meeting on November 13, a mega science project (RIKEN’s next generation super-computer development project aiming at the world-fastest computing speed: FY2010 budget request was 27 billion Yen) was evaluated as “*significant budget cut, nearly equal to termination of budget*”. S&T related issues are not usually broadcasted in TV news in Japan, however, suddenly at this time, these negative evaluations on S&T budget were repeatedly broadcasted as top news.

This screening result invited huge reactions from

scientists, industries and public. Soon after the screening, Dr. Noyori, President of RIKEN and Nobel Laureate, began claiming the necessity of basic and fundamental R&D. On November 19, members of Council of S&T Policy (CSTP) of Cabinet Office published the joint statement to request to keep the S&T budget certainly. Science Council of Japan (SCJ) (on November 20), Japan Business Federation (*Keidanren*) (on November 24) and four Japanese Nobel Laureate scientists (on November 25) followed to claim the importance of S&T budget. Even public expressed the opinions supportive to S&T. For example, over 140 thousands opinions were sent to government on the screening result in MEXT fields [MEXT press release on Dec 16].

You may say that such a substantial debate on S&T budget at the level of public had never been done in the history of Japan. As a result, this process of screening became a good opportunity for public to think of the importance of S&T budget, and for scientists to think of the opinions of taxpayers.



Figure 1 Novel Laureate Dr. Tanaka (top, middle) watching Budget Screening meeting as an ordinary observer (Nov. 17, 2009) [source: Mainichi news]



Figure 2 Four Nobel Laureates and One Fields Laureate presenting joint statement on Budget Screening result. (Nov. 25, 2009) [source: Jiji news]

2.4 FY2010 S&T Budget

Responsible ministers discussed the direction of S&T budget after the Budget Screening, considering public opinions which was relatively supportive to S&T. As a result, in spite of the Budget Screening result, FY2010 S&T Budget was finally set to be 0.8% increase from FY2009. In the case of the supercomputing project which invited central concerns from public, the project was not terminated, but got 22.8 billion Yen (although the requested budget was 27 billion Yen). Furthermore, affected by the Prime Minister's speech in UN Summit on Climate Change, green innovation related R&D budget showed a sharp increase in FY2010.

2.5 New Growth Strategy

Soon after FY2010 Budget was finalized by Cabinet, "New Growth Strategy (outline)" was also decided by Cabinet on December 30, 2009. "New Growth Strategy" is currently discussed in the government and is to be fixed in June 2010.

"New Growth Strategy (outline)" determined

six strategic areas: (1) green innovation, (2) life/health innovation, (3) Asian economic collaboration, (4) Tourism and rural revitalization, (5) Science and Technology, (6) Employment and Education. Innovation, S&T occupied three national strategic areas among six. In detail, in the section of S&T, Cabinet set the target to enlarge the R&D expenditure to 4% of GDP by 2020.

"New Growth Strategy" would determine the direction of S&T budget in the mid-long term. Now, S&T people in Japan are seriously paying attention on "New Growth Strategy" to be fixed this June.

3. Implications

Based on the above description, it can be said that Japan's S&T Budget would have several implications for Korean readers.

(i) Japan's S&T Budget is intensively allocated to basic sciences, while Korean budget is rather allocated to industrial technology and to military use.

(ii) Even in the severe recession of Japan, S&T budget keeps 0.8% increase in FY2010. Especially, the budget on "green innovation" and "basic science"

substantially increased.

(iii) In the process of deciding FY2010 budget, public paid huge attention on S&T budget, with stimulated by the relatively negative evaluation on S&T at the Budget Screening meetings. It would be the first time in Japanese history that public and media have daily debated on the direction of S&T budget.

(iv) Soon after the Budget Screening finished, Cabinet decided “*New Growth Strategy* (outline)” which emphasize the importance of S&T. The strategy

to be fixed this June will include the mid-long term strategy of S&T.

(v) In the “*New Growth Strategy* (outline)”, Asian economic collaboration is also one of six priority areas, as well as S&T. From this, we can expect that S&T cooperation in Asia would become a key policy for Japanese government. If Korea goes in the same direction, Japan and Korea would become two leading engines for establishing Asian S&T Area.