

PL-1 (Plenary)

Our Challenges to Archive an Advanced Science and Technology-Oriented Nation

Masanobu Ohyama

Council for Science and Technology Policy, Cabinet Office, Japan
3-1-1 Kasumigaseki, Chiyoda-ku, Tokyo 100-8970, Japan

1. Introduction

During the last decade of the 20th century, the world underwent an accelerating globalization such as rapid increase of the cross-border movement of information, capital, human resources and so on. That in turn has intensified economic competition among advanced countries and has resulted in the advent of global competition. As the basis of such competition, technologies have advanced remarkably, and governments of various countries have made more efforts on implementation of science and technology policies, recognizing them as one of key policies among others.

Under such international environments, Japan has experienced a serious depression since the collapse of the bubble economy at early part of 1990s. The ongoing asset deflation and the hollowing out of industry have led to a decline in research and development (R&D) investment of private companies, which used to account for approximately 80 percent of the investment in Japan. And R&D environment in universities and national research institutes have been remained in insufficient condition, resulting the deterioration of competitiveness of Japanese science and technologies.

2. Structural Reform of Japan

To overcome this situation, in 1995, the government of Japan, enacted the Science and Technology Basic Law, aiming to be an advanced science- and technology-oriented nation. Based on the law, in 1996, the first Science and Technology Basic Plan (1996-2000) was adopted. The plan described implementing policies to achieve the principle as structuring new R&D systems, realizing desirable R&D basis, promoting education, and forming a national consensus on science and technology. In the plan, governmental expenditure on R&D was estimated as around 17 trillion yen for the five-year period. Due to the impact of the First Plan, R&D level in Japan has been elevated. However recovery of industrial competitiveness is not yet sufficient and economic growth of Japan is not promising. It is further important, therefore, to reinforce industrial technology leading new industry generation and to restore strong international competitiveness.

In 2001, the government of Japan has been reorganized; which includes transformation of major national research institutes into independent administrative institutions. As a part of this reform, the Council for Science and Technology Policy was established. The council serves as a locus of knowledge that assists the Prime Minister and the Cabinet

on overarching matters relating to science and technology for Japan as a whole by formulating plans and performing overall coordination for comprehensive and basic science and technology policy from a perspective one level higher than the ministries. In 2001, the Council formulated the overall strategy that served as the basis for the second Science and Technology Basic Plan (2001-2005).

3. Comprehensive and Strategic Science and Technology Policies

According to the second Science and Technology Basic Plan, the Council for Science and Technology Policy will formulate promotion strategies on prioritized areas, principles of resource allocation, guidelines for project evaluation, R&D system reform, and will strive to promote science and technology activities.

3.1 Overview of the second Science and Technology Plan

(1) Basic principles

In order to enable Japan to become a nation it aims, Japan will promote science and technology pursuant to the following policies:

- Creation of new knowledge; Japan as a country that contributes to the world by creation of knowledge
- Creation of vital energy through knowledge; Japan as a country that is internationally competitive and capable of sustainable growth
- Creation of a prosperous society through knowledge; Japan as a country where people can live safe, peace and high quality lives

(2) Objectives

To pursue science and technology systems which create world-class excellent achievements, the objectives of the plan is set as follows:

- Produce excellent scientific achievement (about 30 Nobel Prize winners in a 50-year period)
- Assure total government R&D investment of approximately 24 trillion yen (1% of GDP; on a level with major European countries)

3.2 Strategic priority setting in science and technology

Japan will promote necessary R&D activities in accordance with priorities on resolving nationally important problem such as enhancement of international competitiveness. Also Japan will deal with newly emerging fields that rapid development is expected with foresight and mo-

bility. The prioritized areas were set as follows:

(1) Four prioritized subjects:

- Life sciences
- Information and telecommunications
- Environmental sciences
- Nanotechnology and materials

(2) Other fundamental four areas;

- Energy
- Manufacturing technology
- Infrastructure
- Frontiers

Science and technology is developing rapidly, and knowledge is becoming specialized. And because new science and technology fields are born in combination or mergence of different fields, in R&D promoting, border or irrelevant areas should be paid attention to.

3.3 Resource allocation

The Council for Science and Technology Policy decided the FY2004 Guidelines on Budgetary/Personnel Resource Allocation. Based on these guidelines, the Council assigned priorities (SABC) to the budget requests involving science and technology measures from the relevant ministries and agencies and arrived at ordered views of the outlooks regarding the primary operations of independent administrative institutions and other such organizations.

(1) Assignment of priorities regarding science and technology-related budget requests

Priority codes (SABC) were assigned to a total of 198 items in order to eliminate unnecessary duplication and the harmful effects of vertical divisions among ministries and agencies, and to secure science and technology-related budgets that prioritize the allocation of R&D resources to programs that are truly important.

S: 32 items (16%) [Previous year was 29%]

A: 91 items (46%) [Previous year was 41%]

B: 59 items (30%) [Previous year was 21%]

C: 16 items (08%) [Previous year was 09%]

(2) Science and technology-related budget draft for FY2004

The total size of the science and technology-related budget in the FY2004 budget draft is 3.6255 trillion yen. This is a 0.8% increase over that for FY2003 (3.5974 trillion yen). Out of the total, general account expenditures for science and technology promotion account for 1.2841 trillion yen, which is a 4.4% increase over FY2003 (1.2298 trillion yen).

According to the priorities assigned to the science and technology-related budget in the FY2004 budget draft, rate of the growth from initial budget in FY2003 is:

S: +16.7%

A: +5.9%

B: -2.8%

C: -20.5% [source: Ministry of Finance]

3.4 R&D evaluation

In FY2003, the Council for Science and Technology Policy conducted evaluations of competitive research fund

systems (evaluation of seven grant systems in terms of results, etc.) and of large-scale R&D, as evaluations of R&D of national importance. The results of these activities were reflected in the FY2004 budget. The examples of large-scale R&D projects evaluated in FY2003 is the Genomic Network Research Project, the Japanese Antarctic Research Program, the Atacama Large Millimeter/sub-millimeter Array (ALMA) Project, the Development Project of Forefront Technology/Instrument for Measuring and Analyzing, and the R&D based on the Third Comprehensive Strategy against Cancer.

3.4 Science and technology system reform

The Council for Science and Technology Policy has established the Expert Panel on R&D system reform to put together basic guidelines for measures related to system reform, as well as conducting comprehensive coordination of measure being taken by relevant government agencies. In order to upgrade science and technology activities and to accelerate restoration to society, Japan will reform the science and technology system as follows:

(1) Competitive research funding system reform

(2) Strategic promotion of business-academia-government collaboration

(3) Creation and promotion of R&D-oriented ventures

(4) Protection and utilization of intellectual property

(5) Regional promotion of science and technology

4. Conclusion

In consideration of the foregoing, based on the view that science and technology in the 21st century, called the “century of knowledge”, should generate new knowledge, maintain sustainable development of both people’s life and economic activities in Japan, and contribute to the world. Therefore Japan, taking into account the experiences of the 20th century and the outlook regarding the 21st century as described above, should have a clear vision as a basis for policies that has three characteristics as:

· A nation contributing the world by creation and utilization of scientific knowledge

· A nation with international competitiveness and ability of sustainable development

· A nation securing safety and quality of life

Japan has to promote science and technology through implementation of practical policies based on the comprehensive strategy, standing on the primary principle to realize “an advanced science- and technology-oriented nation”.