

Chapter 3

Demands on Science and Technology in the Future

Section 1 ■ Formulation of the Third Science and Technology Basic Plan

1 Context and Basic Ideas

● Formulation of the First and Second Science and Technology Basic Plans and Status of Completion

In order to achieve the goal of “becoming an advanced science- and technology- oriented nation” the Science and Technology Basic Law was promulgated in November 1995. The following year the First Science and Technology Basic Plan based on the stipulations of the above Act was established for the period from FY1996-2000. During that period government investment in research and development was over 17 trillion yen. The Second Science and Technology Basic Plan was established for the period from FY2001-2005, with government investment in research and development of over 21 trillion yen. In addition to a focus on four priority fields (life sciences, information and telecommunications, environmental sciences, nanotechnology/materials) for prioritized investment, there was also progress on renewal and upgrades to the science and technology system (Figure 35).

● Basic stances, ideas and goals of the Third Science and Technology Basic Plan

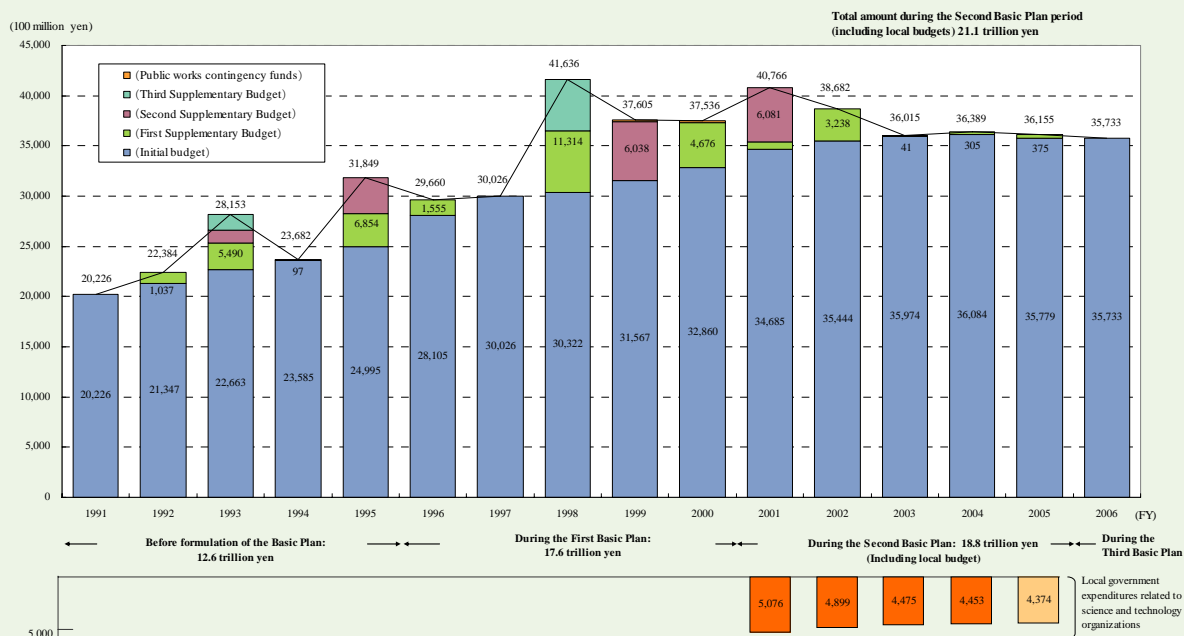
In light of intensifying science and technology competition in the world, the progression of the aging of society with fewer children, safety and security issues, the high expectations of the people regarding the role of science and technology for global problems like environmental problems, and the decline in interest in science and technology apparent among citizens, the Third Science and Technology Basic Plan enacted in March 2006 adopted two basic stances: “Science and technology to be supported by the public and to benefit society,” and “Emphasis on fostering human resources and competitive research environments—Shift of emphasis from hard to soft such as human resources; greater significance of individuals at institutions.”

Furthermore, continuing with the three basic ideas from the Second Science and Technology Basic Plan (create human wisdom, maximize national potential, protect nation’s health and security), six main targets were announced as the concrete policy goals (quantum jump in knowledge, discovery, and creation; breakthroughs in advanced science and technology; economic growth and environmental protection; innovator Japan; nation’s good health over lifetime; and the world’s safest country). In addition to implementation of policies to achieve these aims, evaluations of the policy results are also being conducted.

Additionally, the financial restructuring through the integrated reform of expenditure and revenue is becoming a crucial issue. Under these circumstances, there is a need to ensure that the

percentage of governmental research and development expenditure to GDP in the period of the third basic plan should be raised up to at least the same level as in the U.S. and major European countries from the viewpoint of continuing the effort of S&T promotion made during the period of the previous basic plans. To achieve this, the total amount of the governmental research and development expenditure is estimated about 25 trillion yen.

Figure 35 ▶ Government R&D expenditure (on a Budget Basis)



Note: Includes the science and technology related expenditures of local governments (FY2005 budget numbers are the initial budget)

Source: Created by the Ministry of Education, Culture, Sports, Science and Technology

2 Aims of the Third Science and Technology Basic Plan

A summary of the concrete measures mentioned in the Third Basic Plan is presented below.

(1) Strategic priority setting in science and technology

● Promotion of basic research

Basic research producing diverse wisdom and innovation will be steadily promoted with a certain amount of investment. Research based on the free ideas of researchers as well as research based on policies aimed at developing new understanding for renewal in the economy and society, and for future applications are all being advanced with due consideration to their respective significance.

● Priority setting in R&D for policy-oriented subjects

For the Third Basic Plan, the priority for resource allocation continues to be assigned to four fields to be promoted (life sciences, information and telecommunications, environmental sciences, nanotechnology/materials). In addition, the Council for Science and Technology Policy

establishes the priorities for the “field-specific promotion strategies” and selects “Strategic Prioritized Science and Technology” as the target for focused investment during the period of the Basic Plan including “Key Technology of National Importance.”

(2) Reforming the Science and technology system

● **Developing, securing and activating human resources**

An environment will be developed where human resources with diverse talents, including the young, female, foreign and senior researchers can demonstrate their motivation and abilities to the fullest, while consistent and comprehensive measures for human resources development will be taken, right from the elementary and lower secondary education stages through to the level of full-fledged researchers/engineers. In this way, the quality and quantity of human resources will be secured even as society continues to age.

● **Creating scientific development and persistent innovation**

In order to realize the social and economic value of the results of research and development through innovation and to find the intellectual and cultural value form scientific progress, the goal is to effectively utilize resources for science and technology and to promote science and technology that returns results to society and the people.

● **Reinforcing the foundation for promoting science and technology**

In order to develop and train talented personnel and promote creative, cutting-edge research and development, progress will be made on the preparation of equipment and facilities of universities and public research institutes that form the foundation for research and development activities.

● **Strategically promoting international activities**

For strategic promotion of international science and technology activities, science and technology alliances with other Asian nations will be strengthened, in addition to the promotion of collaborative research and formation of multi-layered networks within bilateral and multilateral frameworks. In addition, the environment to enhance international activities will continue to be developed and efforts will be made to promote the welcoming of talented foreign researchers.

(3) Science and technology to be supported by society and the public

In addition to returning the fruits of science and technology to the people, research institutes and researchers have a basic responsibility to publicize the research activities as much as possible and to explain the content and results in an understandable way to society. In order to enable researchers to understand peoples’ needs, dialogue between researchers and the public will be promoted. In addition, to promote interest in science and technology among the public, there should be thorough education in math and science in primary and secondary education levels, and widespread distribution of easy-to-understand documents on knowledge, techniques, and viewpoints related to science and technology in order to increase the understanding and ability of adults regarding science and technology.

(4) Dealing with a declining population and an aging society with fewer children

In the Third Science and Technology Basic Plan it is crucial to maintain and promote science and technology as a source of power for the country, to make it possible to sustain development and overcome population declines and an aging society with fewer children. It is a goal to overcome diseases afflicting the public, from children to the elderly, and to achieve a society in which everyone can stay healthy. By achieving this goal, science and technology will make a greater contribution to the people, society and the world.

Section 2 ■ Japan and Science and Technology in the Future

1 Science and technology as a source of vitality

Although the Japanese economy has shown signs to shift to a sustainable growth process, there are many problems that Japan needs to handle, including the rapid aging of society and decline in the number of children, the fear of a shrinking labor force, intensifying international competition, large-scale natural disasters, terrorism and global problems like environmental problems. To solve these problems, there are greater and greater expectations placed on science and technology. Indeed, many of the issues that society faces are those that should be addressed by approaches other than science and technology, such as improving the social system, but there are also problems that can only be resolved by introducing new science and technology innovations that go beyond the level of the existing technology. The scope of such societal issues is widening further with the expanding needs of people and society. Science and technology is expected to contribute to realizing a society in which people can act freely and comfortably, bringing economic benefits through innovation, and building a social environment in which people can enjoy spiritual and material ease.

To build the society that people desire, it is not sufficient to simply improve safety and convenience through science and technology; there must also be social systems and mechanisms prepared to deal with the changes. Science and technology alone cannot provide the solutions to all problems, but through a shared understanding of the issues, and solutions to each of the problems that can be addressed, science and technology will be a force that provides enormous benefits to the society of man, and can be a source of social, economic and cultural vitality for the nation.

2 Becoming a problem-solving leader

In order to become a country of significance in the world, Japan needs to become a nation that can actively propose solutions for problem of the sustainable society.

By achieving an abundant and vigorous society even with an aging society with fewer children, Japan should show the world effective solutions and aim to be a leading problem-solver for the world, and science and technology is expected to make a large contribution.