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# **National Guidelines for Evaluating Government Funded R&D**

**October 31, 2008**

**The Prime Minister of Japan**

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The National Guidelines for Evaluating Government Funded R&D are specified in the attached supplement.

These guidelines replace the National Guidelines for Evaluating Government Funded R&D (Determined by the Prime Minister on March 29, 2005).

Supplement

National Guidelines for Evaluating  
Government Funded R&D

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## Introduction

### **(The Place of Evaluation within the Science and Technology Basic Plan)**

Japan enacted the Science and Technology Basic Law (Law No. 130 of 1995), which aims to establish Japan as a nation built on the creativity of science and technology. Based on this law, the first Science and Technology Basic Plan (Cabinet decision, July 1996), the second Science and Technology Basic Plan (Cabinet decision, March 2001) and the third Science and Technology Basic Plan (Cabinet decision, March 2006) were adopted in succession.

Reform of the evaluation system was included in the third Science and Technology Basic Plan as a part of efforts to reform the science and technology system for creating intellectual and cultural value through the development of science and for passing on the benefits of R&D to society and the Japanese public through innovation.

### **(Process for Reforming R&D Evaluation)**

Based on the first Science and Technology Basic Plan, the National Guideline on the Method of Evaluation for Government Funded R&D (by decision of the Prime Minister in August 1996) was adopted to promote R&D evaluation efforts. Based on the second Science and Technology Basic Plan, the National Guidelines for Evaluating Government Funded R&D (by decision of the Prime Minister in November 2001) were adopted to promote strict evaluation. Additionally, the guidelines were revised (by decision of the Prime Minister in March 2005) to promote reform of the evaluation system by, for example, proposing evaluation that motivates researchers and looks at the outcome of research.

### **(Accelerating Efforts to Improve R&D Evaluation)**

To appropriately respond to increasing expectations for R&D in our economy and society in recent years, the Law Regarding R&D Capacity Strengthening and Efficient Promotion of R&D through R&D System Reform (Law No. 63 of June 2008) (hereinafter referred to as the R&D Capacity Strengthening Law) was enacted as a part of efforts to improve R&D activities. To address this issue, there is an urgent need to reinforce efforts to conduct more effective R&D evaluation.

For that purpose, it is necessary to:

- 1) conduct appropriate and effective evaluation that helps to create excellent R&D results, to continuously connect those results to further R&D, and to pass on the results to the Japanese public and society more quickly;
- 2) conduct functional and efficient evaluation that encourages researchers to aggressively and boldly carry out R&D and eliminate excessive evaluation work; and
- 3) conduct evaluation from an international perspective in order to promote results that lead to stronger international competitiveness and the creation of knowledge for the benefit of the world community toward the improvement of international significance of Japanese R&D.

From these considerations, it is essential to accelerate efforts to improve R&D evaluation that takes place at the ministries and elsewhere. The national guidelines were revised to address this situation.

### **(Nature of these Guidelines)**

These guidelines set basic policies concerning evaluation of government-funded R&D. The goal is for evaluating organizations to conduct efficient and high-quality evaluation by appropriately following these guidelines depending on the characteristics of the organization and the nature of the R&D and for such evaluation to lead to excellent R&D in an effective and efficient manner.

These guidelines apply to evaluation conducted by R&D implementation/promotion organizations\*<sup>1)</sup> and by third-party evaluating organizations\*<sup>2)</sup> (for R&D that these guidelines cover).

### **(Relationship between Policy Evaluation and Evaluation of Independent Administrative Institutions, Universities, etc.)**

The R&D evaluation referred to in these guidelines has a different scope of subjects from those subject to policy evaluation under the “Law Concerning Policy Evaluation by Administrative Organizations” (Law No. 86 of 2001) but is in principle conducted with the same goals. These guidelines consider various factors required for policy evaluation and take into account the unique characteristics of R&D activities. Evaluation activities based on these guidelines should be approached in the same manner as policy evaluation according to the law. Evaluation of R&D institutions should be conducted in accordance with the “Law on the General Rules of Incorporate Administrative Agencies” (Law No. 103 of 1999). Evaluation of national universities and inter-university research institutions should be conducted in accordance with the “National University Corporation Law” (Law No. 112 of 2003).

### **(Follow-up on the Implementation of these Guidelines, etc.)**

The Council for Science and Technology Policy follows up on the status of evaluation in accordance with these guidelines to make sure that strict evaluation and appropriate utilization of evaluation results take place. The council also provides advice to related ministries and, if necessary, provides advice concerning revisions to these guidelines.

\*1) R&D implementation/promotion organizations are envisaged as follows:

- Ministries
- Universities (including national, public, and private universities), inter-university research institutes, R&D institutions (R&D institutions prescribed in Article 2, paragraph 8 of the R&D Capacity Strengthening Law and independent administrative institutions conducting R&D other than those prescribed in Article 2, paragraph 8), national research institutions, etc.

\*2) Third-party evaluating organizations are envisaged as follows:

- The Council for Science and Technology Policy
- Incorporated Administrative Agency Evaluation Committee, National University Corporation Evaluation Committee, National Institution for Academic Degrees and University Evaluation, etc.

# Chapter 1 Basic Concept and Framework of R&D Evaluation

## 1. Significance of Evaluation

R&D Evaluation is conducted to effectively and efficiently promote outstanding R&D, including R&D meeting high international standards, R&D that can contribute to society and the economy, and pioneering R&D in new fields.

The significance of evaluation is as follows:

- 1) By continuing to connect R&D results to further R&D activities through appropriate resource distribution based on R&D evaluation results, the benefits of R&D results can be passed on to the Japanese public and society efficiently and quickly.
- 2) Appropriate and fair evaluation will help with the formulation of better measures and policies, leading to, for example, creation of a flexible, competitive, and open R&D environment in which researchers can fully exercise their creativity.
- 3) Conducting supportive evaluation will promote R&D effectively and efficiently by, for example, helping advance R&D and improving its quality, identifying outstanding, innovative, and promising R&D and researchers, and encouraging researchers to be more highly motivated.
- 4) Publicizing outstanding R&D through active disclosure of the evaluation results will help the government fulfill its accountability to the Japanese public and win broad-based understanding and support for the injection of government funds into R&D.
- 5) Reflecting evaluation results appropriately in the allocation of resources, such as the budget and human resources, will help prioritize R&D and make it more efficient.

## 2. Scope of Application of these Guidelines

These guidelines apply to evaluation of (1) R&D themes, (2) researcher performance, (3) R&D organizations, and (4) R&D measures.

The scope of R&D extends to all government-funded R&D. More specifically, subjects are R&D implemented/promoted by organizations such as ministries, universities (including national, public and private universities), inter-university research institutes (hereafter “universities, etc.”), and national research institutions. Also subject to the guidelines are government-funded R&D conducted by private organizations and public testing and research institutions as well as other government-funded R&D carried out overseas.

The ministries should set their guidelines by determining, in accordance with these guidelines, concrete policies concerning the implementation of R&D evaluation including the subject and purpose of evaluation, the utilization and handling of evaluation results, the selection of evaluators, and the timing and methods of evaluation. R&D organizations and third-party evaluation organizations should also determine clear rules in accordance with these and the ministries’ guidelines.

Such guidelines and rules should also be determined in accordance with the basic plan and the ex post facto evaluation implementation plan concerning policy evaluation and the evaluation standards concerning independent administrative institutions, etc.



### **3. Responsibilities of Parties Involved in Evaluation**

#### **(1) Responsibilities of R&D Implementation/Promotion Organizations**

R&D implementation/promotion organizations are responsible for developing, in accordance with these guidelines, specific evaluation mechanisms (development of evaluation guidelines and establishment of an evaluation committee, etc.) that are fair, transparent, and flexible enough to respond to the changing characteristics and progress of R&D and that can steadily connect outstanding results to the next development stage of R&D. These organizations are also responsible for conducting strict evaluation, appropriately utilizing the results, and providing the Japanese people with easy-to-understand information about evaluation results and how such evaluation is reflected in R&D activities. In this process, researchers should be encouraged to bring their abilities into full play by setting challenging, high goals so as to improve the quality and efficiency of R&D. At the same time, thought should be given to how to reduce researchers' evaluation-related workload and time away from their R&D activities. Additionally, related ministries should be responsible as the presiding ministries for ensuring appropriate and responsible evaluation and utilization of evaluation results.

#### **(2) Responsibilities of Evaluators**

Evaluators should always strive to have a proper understanding of the evaluation subject, be aware of their responsibility to conduct impartial, fair and strict evaluation, and maintain an attitude of strict inquiry into the researchers' responsibility for implementing R&D. At the same time, evaluators must try to identify innovative, promising and outstanding researchers and R&D and provide appropriate advice to improve and enhance such R&D.

#### **(3) Responsibilities of Evaluated Parties**

It is extremely important for evaluated parties such as researchers, when conducting government funded R&D, to be fully aware of their responsibility to aggressively take on ambitious R&D themes, to produce R&D results, and to strive to ultimately pass on the benefits of such results to the Japanese public (the taxpayers) and society. Moreover, in the absence of results, researchers must take a serious view of their required accountability and responsibility to produce results.

Researchers must also be fully aware of the importance of evaluation as part of R&D activities, and actively cooperate with evaluation procedures to enable evaluators to gain a full understanding of the content of their R&D by providing comprehensive and correct explanations and other relevant information.

### **4. Conducting Effective and Efficient Evaluation**

When conducting evaluation of R&D targeted by these guidelines, specific and clear goals should be predetermined for different subjects. The goals, the degree to which they have been met, and the results of R&D should be taken into account in the light of international standards.

R&D evaluation varies widely with regard to implementing organizations, subjects being evaluated, evaluation timing, etc. That is why R&D implementation/promotion organizations should develop a concrete evaluation system and conduct evaluation effectively and efficiently to implement high-quality and effective evaluations that suit the particular nature and role of the

organization and to reduce excessive evaluation-related burden on researchers and other related parties.

Additionally, evaluating organizations should examine their evaluation process at appropriate intervals for the purpose of improving the effectiveness and efficiency of evaluation and, if necessary, improve its implementation.

#### (1) Conducting Efficient Evaluation within a Multilayered Structure

Government-funded R&D takes place within a multilayered structure from the viewpoints of both the implementing/promoting organizations and R&D subject to evaluation. The same R&D often becomes the subject of evaluation multiple times because evaluation is conducted at multiple levels in such a multilayered structure.

Thus, in order to eliminate overlapping evaluation of the same R&D, evaluating organizations should effectively and efficiently conduct evaluation by cooperating with other related organizations, sharing evaluation results, and making adjustments to evaluation methods.

#### (2) Clarifying the Organizations Responsible for Evaluation, Utilization of Evaluation, etc.

R&D evaluation should not be conducted for its own sake. It is essential to make sure that evaluation is properly conducted and the results are used properly so that evaluation becomes an effective part of R&D management.

Thus, evaluating organizations should clarify the roles and responsibilities of related organizations (who conducts evaluation and for what purposes, who uses the evaluation results and how, what effects will be produced, etc.) and inform those organizations of such roles and responsibilities before conducting evaluation.

#### (3) Introduction of Electronic Systems for Promoting Inter-Organizational Utilization of Evaluation-Related Information and for Conducting Evaluation

To efficiently select evaluators and conduct evaluation, evaluating organizations should store evaluation-related information such as R&D results, evaluators, and evaluation results in a standardized format and, so that such information can be shared with other related organizations, introduce easy-to-use electronic systems.

Additionally, to conduct evaluation efficiently, electronic systems should be introduced for accepting applications, screening applications, disclosing evaluation results, etc.

### **5. Establishment of Evaluation System**

#### (1) Improvement of Evaluation System

Evaluating organizations should establish a system to appropriately administer effective and efficient evaluation and to improve evaluation to be in line with international standards by, for example, creating divisions devoted to evaluation activities and appointing appropriate persons (from Japan or abroad) with research experience.

To secure the budget required for administering evaluation, conducting investigations and analyses (that are necessary for carrying out evaluation), developing an evaluation system, etc., organizations should consider partially allocating research funds to evaluation duties if necessary.

## (2) Developing and Securing Evaluators

Evaluating organizations should strive to develop and secure people who can, working as evaluators or conducting evaluation-related duties, identify and nurture innovative and outstanding researchers and R&D.

To that end, efforts should be made to introduce and promote an excellent evaluation system, conduct research for the improvement of evaluation methods, etc., create a personnel system for the accumulation of expertise in evaluation divisions, enhance the social standing of evaluators, examine incentives for evaluators to participate in evaluation, develop a system to evaluate evaluators, and develop a comprehensive support system for evaluation.

Evaluation by a specialist plays a key role in the development of R&D. Thus, it is desired that researchers actively participate as evaluators in evaluation. However, if the same researchers are repeatedly asked to engage in evaluation, it becomes a huge burden on the researchers and it also becomes difficult to develop and secure a wider range of evaluators. Thus, evaluating organizations should try to broaden the base of researchers who can participate in evaluation by, for example, having younger researchers and researchers from abroad actively participate in evaluation. It is important for R&D organizations such as universities and R&D institutions to secure outstanding evaluators by increasing incentives, for example, by recognizing such work as an important part of the researchers' careers.

## **6. Improvement of Evaluation to International Standards**

As the globalization of the economy progresses, it is essential that government-funded R&D be conducted from an international perspective to improve the international significance of Japanese R&D, strengthen the international competitiveness of our industries, and promote international cooperation for solving global problems. To respond to the globalization of R&D, efforts should be made, for example, to conduct high-level evaluation that is compatible with international standards by improving the system and the methods of implementation through, for instance, having researchers and authorities related to R&D from abroad participate as evaluators and actively including international benchmarks in the evaluation items.

## Chapter 2 Conducting Evaluation by Subject

Evaluating organizations should determine clear and specific subjects for evaluation and, in advance, clearly determine the strategic positioning of each subject in R&D efforts, who should utilize such evaluation, and how. Then, clear and specific objectives of evaluation should be determined and communicated to the parties to be evaluated prior to the evaluation.

The principles of implementing evaluation by subject are as follows.

### I. Evaluation of R&D Themes

An R&D theme is an individual unit for implementing specific R&D, which is conducted to achieve clear objectives set by the ministries or after being selected for its excellence among other candidate topics applied for competitive funds, etc.

Evaluation should be conducted after appropriately determining evaluation objectives, how evaluation results will be used, evaluation items and standards, etc. and after developing the necessary implementation system and so forth in accordance with the nature of the R&D (fundamental, applied, developmental, or provisional research, etc.), its field, objective, positioning in the policy, and size.

#### 1. Evaluating Organizations

Evaluation of R&D themes is conducted by organizations such as the ministries that set the themes and the ministries or the R&D institutions that administer competitive funds.

#### 2. Selection of Evaluators

External specialists, etc. should conduct evaluation.

To keep evaluation fully objective, evaluating organizations should select specialists, etc. who can appropriately evaluate R&D to be evaluators for each evaluation subject without regard to their ages, organizations, genders, etc. Such specialists, in particular from industry, should be actively selected with a view towards quickly passing on the benefits of R&D to the Japanese public and society through innovation.

Additionally, to ensure fairness, persons with a stake in the R&D being evaluated should not be selected as evaluators and the names of evaluators should be disclosed. Flexibility of the evaluation system and consistency of evaluation should also be ensured by, for example, including both new and previous evaluators throughout a series of evaluation.

Evaluators must keep evaluation contents absolutely confidential, so as to avoid having any new conflicts emerge between researchers.

#### 3. Timing of Evaluation

Evaluation should be conducted prior to the implementation of the R&D to understand the necessity of the theme, the validity of the objective and the plan, etc. and to determine the resource allocation including the budget. Evaluation should be conducted also around the time of the

completion of the R&D to understand the degree to which goals have been met and to use such results for further development of the theme.

The evaluation at term should be conducted at an appropriate time prior to the completion of R&D so that promising and outstanding results of R&D can be followed up seamlessly by next R&D. In this case, the results of the second evaluation should be referred to when evaluating a different but follow-up R&D theme prior to its implementation. Additionally, R&D using competitive funds has a short implementation period, so the evaluation for a continuing theme should be conducted at the same time that the results of the previous R&D are evaluated. Effective evaluation should be administered in this manner.

In addition, interim evaluation for long-term R&D should be conducted approximately every three years to evaluate progress and understand any changes in the environment in order to determine whether the R&D needs to be suspended, discontinued, or changed. However, an interim evaluation is not necessarily required for R&D with implementation periods of about five years if evaluation of the results of such R&D is planned prior to the completion of the R&D and if there are no major changes in the plan, etc. In this case, the progress should be properly managed by providing a progress report every year.

Additionally, after a certain period of time from the completion of R&D, a follow-up evaluation should be conducted to understand if there are any secondary or ripple effects, to verify the validity of the past evaluation, and to use the results for examining future R&D themes and improving evaluation, etc. Follow-up evaluation should be aimed at major, high-priority R&D themes involving substantial government funding.

Such series of evaluations should be conducted to maintain continuity and consistency in a coordinated fashion by determining, prior to the start of R&D, the timing, the objective, and the methods of evaluation, how to use the previous evaluation results, etc.

#### **4. Method of Evaluation**

To ensure fairness, reliability, and continuity, and to conduct effective evaluation, evaluating organizations should clearly and specifically define methods of evaluation (evaluation technique, evaluation perspectives, evaluation items and criteria, evaluation process, etc.) in advance and communicate these methods to the parties to be evaluated. According to the evaluation objectives, the evaluation subject, the timing of evaluation, the nature of R&D, etc., flexibility in evaluation must be ensured by, for example, determining appropriate evaluation items, criteria, and techniques. Additionally, to respond to the rapid advancement of science and technology and great changes in society and the economy, evaluation items, criteria, etc. should be appropriately revised.

##### **(1) Evaluation Technique**

When conducting evaluation, appropriate investigation/analysis and evaluation techniques should be selected depending on the subject, timing, objective, and available information to be evaluated.

Evaluation of the results of R&D, in particular, must be attached to importance to the quality, showing the level of such results because the ultimate objective of R&D is to yield outstanding results.

In this case, to ensure objectivity in evaluation, every effort should be made to apply evaluation methods using specific indicators and numerical values. However, uniformly using

quantitative evaluation techniques inhibit efforts to conduct challenging R&D in some cases of fundamental research, etc. Thus, evaluation should not depend excessively on quantitative techniques and it is critical to use qualitative techniques at the same time, by, for example, introducing international benchmarks and asking specialists in the field about the impact of R&D on the advancement of science and the possibility of new developments in the field.

Evaluation of R&D results must be based on the degree to which its objectives have been met. At the same time, it is important to appreciate promising results from a wider perspective, taking into account the validity of the process, the secondary effects, the promotion of better understanding, the improvement of the research base, etc. At this time, factors for the success or failure of the outcome should be clarified for the improvement of any follow-up R&D, etc.

## (2) Evaluation Perspectives, Items and Criteria

Evaluation should be conducted in accordance with the perspective on policy evaluation set out in the “Law Concerning Policy Evaluation by Administrative Organizations” as well as with a view towards necessity, efficiency, effectiveness, and improvement of the international significance of R&D. Based on these perspectives, when conducting evaluation, appropriate evaluation items and criteria should be set depending on the characteristics of R&D, the objective of evaluation, etc.

## (3) Utilization of Self-inspection

Evaluated parties should be encouraged to take the initiative in evaluation and evaluation should be conducted more efficiently. To that end, evaluated parties, etc. (including the ministries, R&D institutions and researchers) should, when planning for R&D, specify concrete and clear objectives for their R&D and indicators to mark their progress and, after starting R&D, self-evaluate the results and prospects for further development. At the same time, evaluators should conduct evaluation by checking such self-evaluation among other things.

# 5. Utilization and Handling of Evaluation Results

## (1) Utilization of Evaluation Results

To make evaluation work effectively, it is necessary to utilize the evaluation results properly in accordance with clearly predefined evaluation objectives and utilization methods. Evaluating organizations and R&D institutions should, according to the characteristics of the organization, use evaluation results to determine the allocation of resources including budgets and human resources, to provide advice for the improvement of the quality of R&D, etc. Additionally, such results should be used when making R&D-related policies and measures and to effectively and efficiently promote such policies and measures.

In addition, to continuously connect past R&D to future R&D through the appropriate allocation of resources based on evaluation results, such results should be shared with other organizations and systems. To facilitate such efforts, the Cabinet Office and other offices should develop a system in which related ministries can cooperate with each other.

## (2) Active Dissemination of Evaluation Information to the Japanese Public

Evaluating organizations should actively release evaluation results to the Japanese public to be accountable for government funding of R&D, etc., to ensure fairness and transparency of R&D evaluation, and to promote the wide use of the results of R&D and its evaluation in society and

industry. When releasing such information, the privacy of personal information, intellectual property, and national security must be protected. Additionally, not only the results of evaluation but also the following information should be released in an easy-to-understand manner: the objective of the R&D, its contents, the outcome, the results of self-evaluation, and how the evaluation results may influence the development of new R&D and policies.

### (3) Disclosing Evaluation Results to Evaluated Parties, etc.

Evaluating organizations must disclose evaluation results upon request to applicants and other evaluated parties.

While evaluators are responsible for finalizing evaluation results and evaluated parties must take such results seriously, it is necessary to develop a system in which evaluated parties can request an explanation of the evaluation results.

It is also desirable to create a system in which, if the evaluated parties disagree with the evaluation, they can communicate substantive reasons for disagreement to the evaluating organizations concerning the evaluation results.

### **(Reference) Evaluation Method for Major Types of R&D Themes**

The principles for evaluating R&D themes are prescribed in Chapter 2-I. Examples of evaluation items, criteria, etc., for major types of R&D themes are provided for reference to make the implementation easier.

Evaluation items should include:

- 1) from the perspective of necessity: the scientific, technological, social, and economic significance, the validity as government-funded R&D, etc.;
- 2) from the perspective of efficiency: the validity of the planning, implementation procedure, cost structure, cost-effectiveness, methods and approaches of R&D, etc.;
- 3) from the perspective of effectiveness: the setting of objectives and the degree of progress with a focus on (prospective) results, the (prospective) outcome, the (prospective) effects, ripple effects, etc.

In addition to evaluation prior to the implementation of and at the time of the completion of R&D, in cases of long-term R&D, evaluation should be also be conducted regularly or when entering new phases of R&D, to check whether the R&D needs to be changed (including suspension and cancellation) based on current progress or changes to the environment, etc.

#### (1) Evaluation of Fundamental Research

- 1) Prior to the implementation of R&D, the originality of the theme's objectives, the techniques used to accomplish such objectives and the possibility of creating new knowledge should be evaluated, taking into account both the contents of the plan and the past accomplishments of the evaluated party.

The evaluated party should provide self-evaluation results for the evaluation items and criteria that are most appropriate for the theme. Evaluation should be conducted taking into consideration the self-evaluation results.

- 2) At the time of the completion of R&D, evaluation should be conducted emphasizing how the results contribute to the creation of new knowledge and what scientific value the

results hold at an international level as well as taking into account the self-evaluation results of the evaluated party.

Even if the results are different from the direction presented in the original plan, self-evaluation, etc. should be used to acknowledge such results if they are scientifically remarkable.

Additionally, the prospects for further development of the R&D should be fully examined from an interdisciplinary and industrial perspective and evaluation should be conducted to determine if continuing support, revision of the direction, etc. are necessary to link the results to future R&D efforts.

## (2) Evaluation of Project Research (Applied Research and Development Research)

- 1) Prior to the implementation of R&D, based on whether policy goals have been met and on international benchmarks, the appropriateness of the quantitative goals (aiming for an achievement within a certain period of time) and of the level of such goals should be evaluated.

In addition, the techniques to achieve the goal, the validity of the system, etc., the possibility of achieving the objective, and the prospect of putting the results to practical use (when the goal is accomplished) and so forth need to be evaluated.

- 2) At the time R&D is completed, evaluation should be conducted to help determine its future direction. Primarily, evaluation needs to be based on the degree to which the objective and the quantitative goal have been met. At the same time, the outcome and the factors for that outcome should also be analyzed and the evaluation should emphasize whether the R&D is expected to develop further.

## (3) Evaluation of National Projects including Key Technology of National Importance

- 1) Prior to the implementation of R&D, the mission to be achieved should be clarified including the positioning of the R&D in the policy, the quantitative objective, the functions, etc. Then, the validity and feasibility of the plan, the implementation system, the management of the implementation, cost-effectiveness, etc. should be examined.
- 2) At the time of the completion of R&D, evaluation should be conducted to see if the policy objective was achieved. Primarily, evaluation should be based on the degree to which such a goal has been met. At the same time, the evaluation should also emphasize whether the results (achieved technology) are internationally significant, whether such results create ripple effects (by, for example, contributing to the development of science, improving the international competitiveness of industry, etc.), whether such results were appropriately cost-effective, etc.



## II. Evaluation of Performance by Researchers, etc.

As part of efforts to reform the science and technology system, the Third Science and Technology Basic Plan prescribes, concerning the treatment of researchers, the thorough implementation of a fair and transparent personnel system by, for example, actively rewarding outstanding efforts based on researcher performance and ability.

To that end, the heads of R&D organizations such as R&D institutions and universities should develop appropriate and efficient evaluation rules in accordance with the objectives of the organizations, etc. and responsibly evaluate their researchers' performance. The results of performance evaluations of researchers, etc. should be reflected positively in the treatment of researchers, the allocation of research funding, etc.

Evaluation should be conducted taking into account the planning and the management of R&D, evaluation activities, contribution to international standardization, and other related activities in addition to the results of the R&D. Both research and educational aspects should be considered when evaluating R&D at universities, etc. Additionally, researchers should self-evaluate and the results should be taken into consideration. At the same time, it is also necessary to avoid intimidating researchers but rather encourage them to boldly take on challenges by, for example, taking into account the difficulty of the themes they are tackling. Evaluation of the results by researchers, etc. should be efficiently conducted by appropriately taking advantage of the evaluation results on the themes of such researchers for competitive funds and of the evaluation results on project research by the government.

Additionally, it is essential to get research assistants' cooperation for the promotion of R&D. The specialized abilities of research assistants and their contributions to the promotion of R&D need to be appropriately assessed.

### III. Evaluation of R&D Organizations, etc.

#### 1. Evaluating Organizations

The heads of R&D organizations, etc. should self-evaluate their activities according to the objectives of the organizations, their medium-term targets, etc. When conducting self-evaluation, both the management of the organizations and the implementation and promotion of R&D should be considered.

#### 2. Selection of Evaluators

Outside specialists, etc. should evaluate the implementation and promotion of R&D. The names of evaluators should be disclosed to make evaluation more objective and fair.

Other matters regarding the selection of evaluators are specified in I-2.

#### 3. Timing of Evaluation

Evaluation of the implementation and promotion of R&D should be conducted regularly, taking into account the interval set for the achievement of medium-term targets, etc. (roughly between three to six years).

#### 4. Method of Evaluation

##### (1) Evaluation of the Implementation and Promotion of R&D

Primarily, the degree to which goals (that were set specifically and clearly) have been met should be evaluated for the total R&D that R&D organizations, etc. implemented and promoted. In this case, specific goals should be determined for individual themes and so forth in medium-term plans based on policy objectives and international benchmarks. Then, in accordance with the evaluation methods, etc. specified in I and IV, progress (among other things) should be self-inspected by appropriately using the evaluation results for R&D conducted through competitive funding systems, funding systems commissioned by the government, etc. Then, taking into account the self-inspection results, evaluation should be finalized.

##### (2) Evaluation of Organizational Administration

When evaluating what kind of administrative activities have been done to achieve the goals of R&D, to create a suitable environment for R&D, etc., evaluation items should be appropriately chosen in accordance with the R&D organizations' founding objectives, the medium-term targets, etc. Efficiency should also be emphasized.

#### 5. Utilization and Handling of Evaluation Results

##### (1) Utilization of Evaluation Results

Evaluation results should be reflected in the allocation of resources at the organizations

such as the budget for the administration of the organization and human resources.

Additionally, since the heads of the R&D organizations are responsible for the organizations' administration, the evaluation results should be reflected in the evaluation of the heads of such organizations.

#### (2) Active Dissemination of Evaluation Information to the Japanese Public

The heads of R&D organizations should actively release evaluation results to the Japanese public in order to be accountable to the Japanese public concerning their use of government funding for R&D, etc., to ensure fairness and transparency of R&D evaluation, and to promote the wide use of the results of R&D and its evaluation in society and industry.

When releasing such information, the privacy of personal information, intellectual property, and national security must be protected. Additionally, not only the results of the evaluation but also the following information should be released in an easy-to-understand manner: the objective of the R&D, its contents, the outcome, the results of self-inspection, how the evaluation results may influence the development of new R&D and policies, and so forth.

### **6. Conducting Evaluation Based on Characteristics of R&D Organizations, etc.**

In addition, evaluation should be conducted based on the characteristics of R&D organizations, etc.

#### (1) Evaluation of Universities, etc.

Universities, etc. should strictly self-inspect and self-evaluate their activities as specified in the School Education Law, etc. Their initiatives should be respected and the comprehensive promotion of education and research and other characteristics should be taken into consideration. Additionally, the National University Corporation Evaluation Committee should evaluate, based on the National University Corporation Law, the performance (the degree to which medium-term targets have been achieved, etc.) of national university corporations and inter-university research institute corporations during the interval set for the achievement of medium-term targets. (The National Institution for Academic Degrees and University Evaluation should evaluate educational research and the results should be respected accordingly.) Then, the Ministry of Education, Culture, Sports, Science and Technology should reflect such evaluation results in the adequate allocation of management expenses grants, etc. As for private universities, the evaluation of research, etc. conducted by the National Institution for Academic Degrees and University Evaluation should be used.

#### (2) Evaluation of R&D Institutions, etc.

R&D institutions should strictly self-evaluate their performance (the degree to which medium-term targets have been achieved, etc.) during the interval set for the achievement of medium-term targets based on the Law on the General Rules of Incorporated Administrative Agencies. In addition, the Evaluation Committee for Independent Administrative Organizations should conduct evaluation by fully taking advantage of the self-evaluation results by R&D institutions. Then, related ministries should reflect such evaluation results by the Incorporated Administrative Agency Evaluation Committee into the appropriate allocation of management expenses grants, etc. Additionally, R&D institutions, etc. should make sure that their self-evaluation results and the evaluation results from the Incorporated Administrative Agency

Evaluation Committee are reflected in their organizational administration.

When the Incorporated Administrative Agency Evaluation Committee evaluates the implementation and promotion of R&D, the emphasis should be placed on whether R&D institutions appropriately conducted self-evaluation in accordance with these guidelines and whether such evaluation results were appropriately reflected in the administration, among other things.

### (3) Evaluation of other Organizations Conducting R&D with Government Funding

When evaluating organizations evaluate the R&D themes, etc. of private organizations, public testing and research institutions and other organizations that carry out R&D with government funding (commissioned R&D, joint research, etc.), they should do so as necessary considering the effective and efficient use of government funds in relation to the administration of these organizations.

## IV. Evaluation of R&D Measures

National policies are, in general, hierarchically-structured. Thus, different themes, etc. of government-funded R&D are, according to specific policy objectives and goals, systemized into groups of measures, the competitive funding system, and research promotion policies, strategies, plans, etc. by field. Evaluation should be aimed at each of these measures and systems that include goals.

### 1. Evaluating Organizations

The ministries, R&D institutions, etc. that implement such R&D measures are the ones to evaluate their measures.

### 2. Selection of Evaluators

Outside specialists, etc. should conduct evaluation.

To fully maintain the objectivity of evaluation, evaluating organizations should select specialists, etc. who can sufficiently evaluate each subject without regard to age, affiliation, gender, etc. For evaluation of R&D measures, in particular, evaluators should be actively selected from a wide range of specialists in industry, the humanities, the social sciences, etc. to make sure that the needs of society and the economy are appropriately reflected in the evaluation.

In addition, to secure fairness, persons with a stake in the outcome should not be selected and the names of evaluators should be disclosed. Flexibility of the evaluation system and consistency of evaluation should also be ensured by, for example, including both new and previous evaluators in a series of evaluations (from evaluation prior to R&D to follow-up evaluation).

### 3. Timing of Evaluation

Evaluation should be conducted prior to the implementation of measures, to understand the necessity, the validity of the objective and the plan, etc. in the light of the national policies and to determine resource allocation including the budget. Evaluation should be conducted also around the time of the completion to understand the results including the degree to which goals were met and to use such results for further development of the theme.

The evaluation at term should be conducted prior to the completion of R&D if it is necessary to reflect such results in further R&D measures. The results should be used accordingly to make plans, etc. for future R&D measures.

In addition, an interim evaluation should be conducted approximately every five years for R&D measures that do not have specific implementation periods to understand any changes in the environment and the degree to which goals have been met and to determine if such measures need to be suspended, discontinued, or changed.

Additionally, after a certain period of time from the completion of R&D measures, a follow-up evaluation should be conducted to understand if there are any secondary or ripple effects, to verify the validity of the past evaluation, and to use the results for forming further R&D measures and improving evaluation, etc.

These evaluations should be conducted to maintain continuity and consistency by relating them in a coordinated fashion. Efficient evaluation should also be conducted by correlating to policy evaluation.

#### **4. Method of Evaluation**

To ensure the reliability, continuity, and efficacy of evaluation, evaluating organizations should clearly and specifically define methods of evaluation (evaluation techniques, evaluation perspectives, evaluation items and criteria, evaluation process, etc.) in advance. Depending on the evaluation objective, the evaluation subject, the timing of evaluation, the nature of R&D, etc., the flexibility of the evaluation process must be ensured by, for example, determining appropriate evaluation items, criteria, and techniques.

Additionally, to respond to the rapid advancement of science and technology and great changes to society and the economy, evaluation items, criteria, etc. should be properly revised.

##### **(1) Evaluation Technique**

For each evaluation, appropriate investigation/analysis and evaluation techniques should be selected depending on the evaluation subject, timing, objective, and available information. In this case, to ensure objectivity, every effort should be made to apply evaluation methods using specific indicators and numerical values.

When evaluating the results of R&D measures, the degree to which the objective has been met should be the basis for determining whether such measures were successful or not. At the same time, it is important to look at promising results from a wider perspective, taking into account the validity of the process, secondary effects, improved understanding of the subject, improvement of research fundamentals, etc. At this time, factors for the success or failure of the outcome should be clarified and, to prevent overlapping evaluation of the same results, evaluation should be conducted efficiently by, for example, using evaluation results of individual themes, etc.

##### **(2) Evaluation Perspectives, Items and Criteria**

Evaluation should be conducted in accordance with the perspective on policy evaluation as set out in the “Law Concerning Policy Evaluation by Administrative Organizations” as well as with a view towards necessity, efficiency, effectiveness, and improving the international significance of Japanese R&D. In particular, the emphasis should be placed on consistency with policy goals. To that end, necessary evaluation items and criteria should be set.

As for R&D measures that are made up of multiple individual R&D themes, etc., particular emphasis should be placed on whether the accomplishment of the objectives of individual themes is clearly connected to the achievement of the objectives of the R&D measures, whether such measures are coordinated with other related measures and effectively and efficiently promoted, etc.

##### **(3) Utilization of Self-Evaluation**

The ministries and other evaluated parties, etc. should, when planning for measures, specify concrete and clear objectives and indicators to mark progress, etc. and, after starting such measures, self-evaluate their progress and the prospects of further development, etc. Then, evaluators should conduct their evaluation by checking such self-evaluation among other things.

## **5. Utilization and Handling of Evaluation Results**

### **(1) Utilization of Evaluation Results**

To make evaluation work effectively, it is necessary to utilize the evaluation results properly and in accordance with clearly predefined evaluation objectives and utilization methods.

Organizations conducting R&D measures should, according to the characteristics of the organization, use evaluation results to determine the allocation of resources including budgets and human resources and to improve such measures. Additionally, these organizations should monitor how such evaluation results are used and release the results in order to be accountable to the Japanese public. Additionally, such results should be used to make plans for R&D-related policies, etc. and to effectively and efficiently promote such policies.

### **(2) Active Dissemination of Evaluation Information to the Japanese Public**

Evaluating organizations should actively release evaluation results to the Japanese public in order to be accountable for the use of government funding for R&D, etc., to ensure fairness and transparency of R&D evaluation, and to promote the wide use of the results of R&D and its evaluation in society and industry. When releasing such information, the privacy of personal information, intellectual property, and national security must be protected. Additionally, not only the results of evaluation but also the following information should be released in an easy-to-understand manner: the objective of R&D, its contents, the outcome, the results of self-evaluation, how the evaluation results can influence the development of new R&D and policies, etc.