



Analysis of the Planning, Selection, and Evaluation System of National R&D Projects

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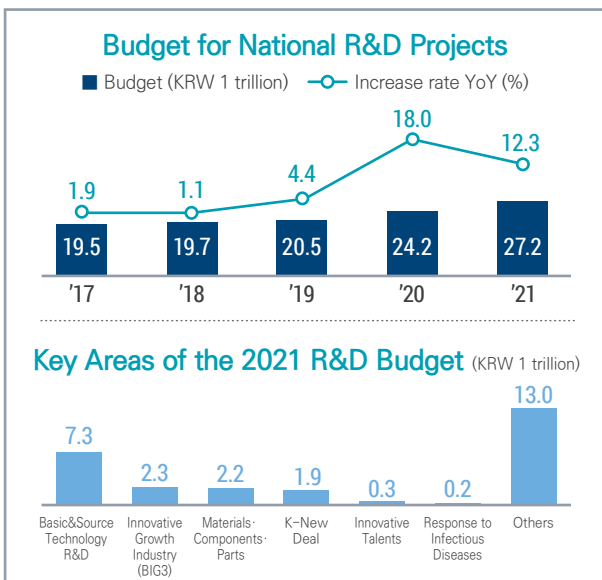


The Korean government is expanding the budget for national R&D projects to secure core technologies for promising industries and improve technological competitiveness in key industries. However, some experts have pointed out the lack of creativity and achievements saying that national R&D projects must seek new and inventive tasks and utilize strategic task planning.

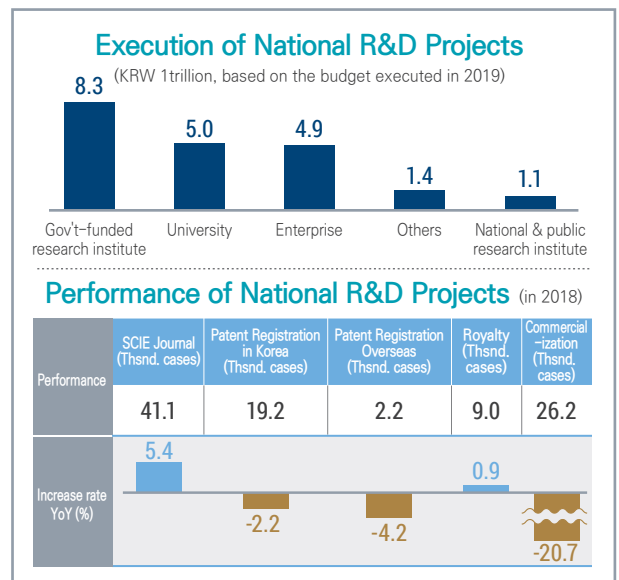
Following the analysis of the national R&D project published in 2019, we reviewed the current issues and improvements to be made, focusing on the project planning, selection, and evaluation stage in the national R&D project system. We determined from the analysis the need for establishing an R&D investment strategy for all ministries, creating an R&D task planning system based on technology and market demand, strengthening expertise and fairness in R&D task selection and evaluation processes, designing an effective industrial technology R&D planning system, and expanding support for SMEs to strengthen their capabilities in R&D innovation.



I. National R&D Projects



Source: Ministry of Economy and Finance

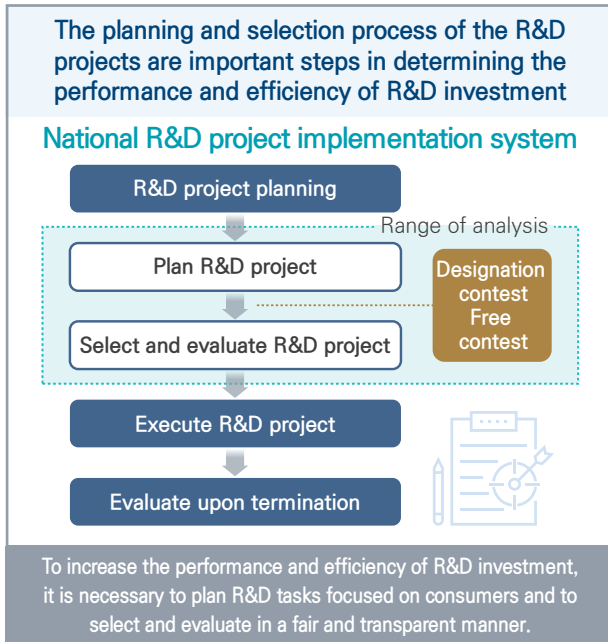


Source: Ministry of Science and ICT

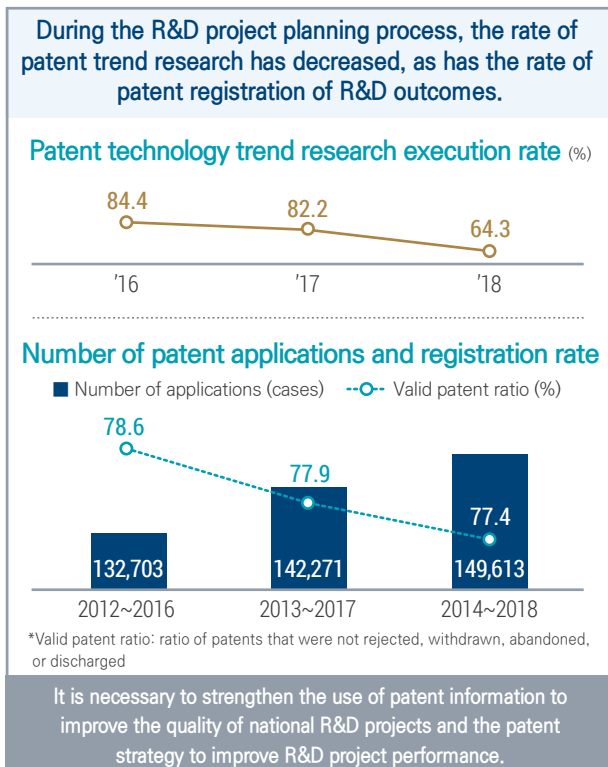
II. Analysis of Key Issues

1. National R&D project planning system

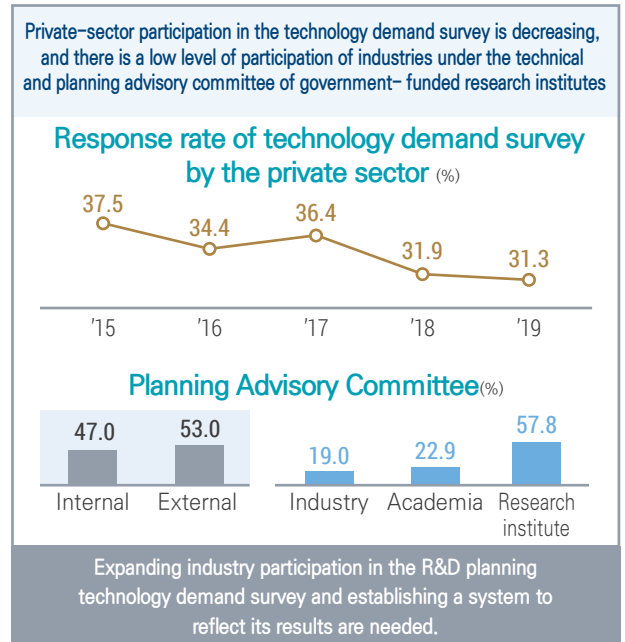
- National R&D project implementation system



- R&D strategy planning using patent information

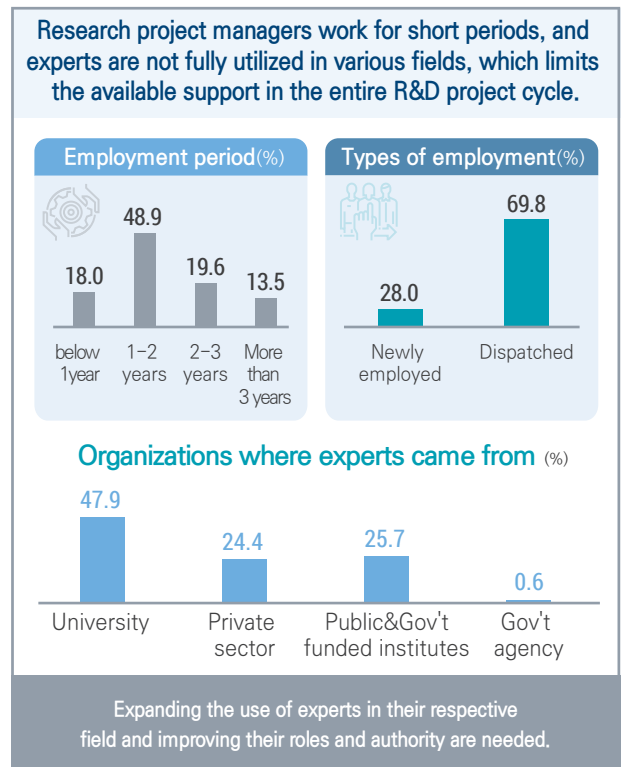


- Technology demand survey system



Note: As of June 2020

- Use of R&D planning experts



2. The evaluation system of the National R&D project selection process

- The management system for R&D project evaluators

The participation of evaluators from special research management institutes is generally low compared to the total number of potential evaluators. There is no system allowing joint use of evaluators from different ministries.

Participation rate of evaluators from the specialized research management institutes

Institutes	No. of evaluators	Participation rate (%)	No. of evaluators who took part in over 20 cases annually
National Research Foundation of Korea	104,677	9.2	1
Korea Institute of Industrial Technology	31,230	11.2	0
Korea Technology and information Promotion Agency for SMEs	24,952	13.8	274
Defense Agency for Technology and Quality	23,225	5.1	0
Institute of Information&Communications Technology Planning&Evaluation	12,175	23.4	0
Korea Institute of Planning and Evaluation for Technology in Food, Agriculture, and Forestry	9,473	18.3	160
Korea Environmental Industry & Technology Institute	9,280	9.2	0
Korea Health Industry Development Institute	8,571	10.0	0
Korea Agency for Infrastructure Technology Advancement	6,614	19.2	0

It is necessary to establish an integrated management system for evaluators across ministries and to strengthen expertise and fairness when forming the evaluation committee for the selection process.

Note: For institutes with more than 5,000 evaluators, as of 2019

- R&D project selection process

Some areas are insufficiently managed: Project managers participate in the R&D project, and standards for evaluation items, and the scoring system in the selection process by R&D project type are insufficient.

- (1) Concerns about fairness arise as project managers participate in national R&D projects while employed or immediately after their retirement.

Research project managers participating in R&D projects during their employment period

Institutes	No. of managers	No. of R&D projects per person
Korea Health Industry Development Institute	16	2.56
National Research Foundation of Korea	118	1.66
Korea Energy Technology Evaluation and Planning	35	1.62

- (2) Lack of transparency in selection process: bonus points were given to projects irrelevant to original purpose
 * Examples of additional points given to irrelevant R&D: Best family friendly management companies, Onnuri voucher campaign participating company, StartupMarket registered companies, etc.

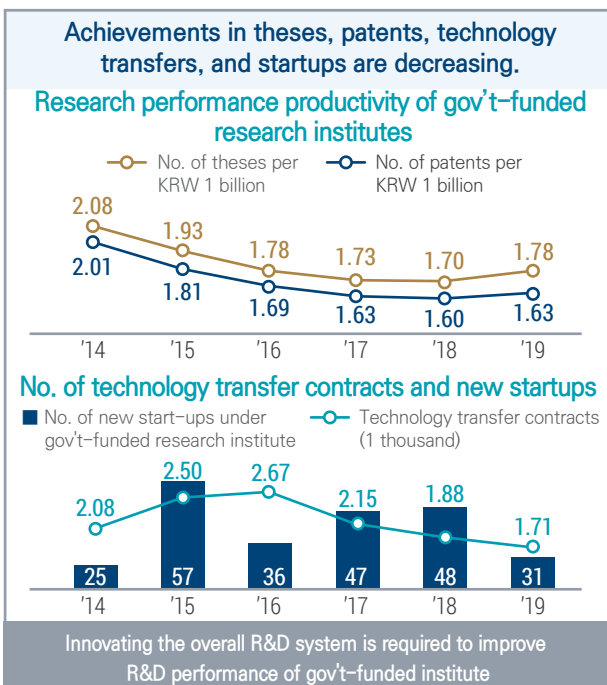
To avoid concerns about fairness and equity in the R&D selection and evaluation process, research project managers should not participate in R&D project selections, and reasonable selection and evaluation guidelines must be in place.

Note: As of June, 2020

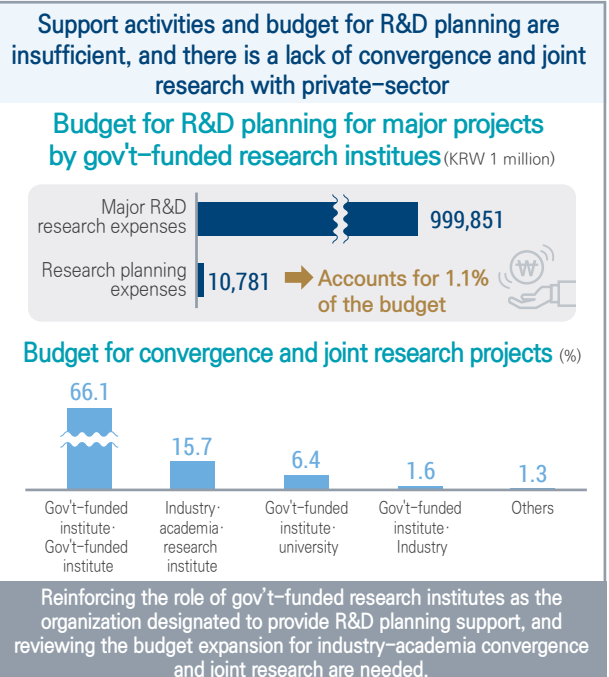
3. Analysis of project planning and selection of key national R&D projects

(1) R&D of gov't-funded research institutes under the National Research Council of Science & Technology

- R&D performance of gov't-funded research institutes



- Gov't-funded research institutes' R&D project planning and support for SMEs



Source: National Research Council of Science & Technology (As of 2020 budget)

(2) Industrial technology R&D

- Technology demand survey results were insufficiently reflected in R&D project planning

A system to effectively reflect the results of the technology demand survey in R&D task planning is needed.

No. of technology demand surveys of material & competent technology development projects (cases)

Year	No. of surveys
'15	1,076
'16	606
'17	867
'18	624
'19	2,036

No. of cases reflected technology demand survey results (cases)

	Registered	Reflected	Partially reflected	Not reflected
Design innovation promotion projects	94	17	24	53
National standard technology improvement projects	165	63		102

* The technology demand survey of material&component technology development project expanded after the Japanese export regulations in 2019.

It is necessary to establish standards to systematically reflect the results of the technology demand survey in project

- Improving the industrial technology R&D planning and management system

The Office of Strategic R&D Planning and KEIT are being operated in an integrated manner, but there are concerns about overlapping functions between them.

Comparison of key functions of KEIT and the Office of Strategic R&D Planning

	KEIT	Office of Strategic R&D Planning
Strategic Planning	Establishes technical roadmap by industry	Establishes directions for industrial R&D investment plan and policies
Planning	Supports the discovery of new business and projects	Supervises the discovery and management of new projects and tasks, verifies feasibility and redundancy
Performance management	Performance management including performance analysis	Performance evaluation

※ KEIT: Korea Evaluation Institute of Industrial Technology

There is a need for continuous efforts to coordinate the roles and responsibilities between the Office of Strategic R&D Planning and the KEIT.

(3) Support R&D planning for SMEs

- Expand support for R&D planning SMEs

Despite the demand for R&D planning from SMEs, policy support from the Ministry of SMEs and Startups is insufficient.

Ratio of R&D budget spent on planning (%)

Ministry of SMEs and Startups

1.71
98.29

■ Planning support
■ R&D and commercialization support

US SBIR

21.9
78.1

■ Step 1 (Planning support)
■ Step 2 (R&D support)

※ As of 2020 for the Ministry of SMEs, and as of 2018 for the US SBIR

To support SME innovation and growth, it is necessary to expand R&D planning support to explore technological values and improve planning capacity before technology development.

- Improving performance management and finding ways to support them are required.

Follow-up tasks for R&D planning projects are rarely selected, and companies that are not suitable for the purpose of the project are selected as beneficiaries.

Selection rate of follow-up tasks of R&D planning projects (%)

Year	Selection rate (%)
'15	34.3
'16	42.1
'17	12.3
'18	13.8

Benefit rate of SMEs in the Network Technology Development (planning support) Project (%)

Year	Benefit rate (%)
'17	24.6
'18	30.3
'19	14.5

○ Rate of R&D first-step companies

Strengthening SMEs' planning capabilities is necessary to increase the rate of linkage with R&D projects. It is also important to increase support for small businesses suitable for the project purpose as well as companies taking their first steps in R&D