

Research and Development Project of the Enhanced Infrastructures for Post-5G Information and Communication Systems

NEDO dept. in charge: Semiconductor and Information Infrastructure Department
Artificial Intelligence and Robotics Department
METI dept. in charge: Innovation and Environment Policy Bureau Innovation
Policy, Division, Commerce and Information Policy Bureau IT
Industry Division, Manufacturing Industries Bureau Industrial
Machinery Division

Project Overview

1) Project Objectives

This project aims to develop core technologies for post-5G information and communication systems and enhance Japan's R&D and manufacturing infrastructure for post-5G information and communication systems.

2) Project Details

1) Development of post-5G information and communication systems (Entrustment, Subsidy)

This item aims to support the development of systems that are particularly important for achieving the levels of performance required in the post-5G era, as well as related technologies, including semiconductors and edge devices used in these systems. (Entrustment, Subsidy)

2) Development of manufacturing technologies for advanced semiconductors (Subsidy, Entrustment)

Through the creation of pre-commercial manufacturing pilot lines and related activities, this item aims to support the development of front-end and back-end manufacturing technologies for leading-edge logic semiconductors that are not currently available in Japan. (Subsidy)
This item also supports the development of system design technologies for advanced semiconductors and core technologies in which Japan has a competitive advantage, such as packaging and miniaturization technologies required for manufacturing. (Entrustment, Subsidy)

3) Feasibility study (Entrustment, Subsidy)

This item supports 1) feasibility studies related to post-5G information and communication systems and 2) feasibility studies related to advanced semiconductor manufacturing technologies. (Entrustment, Subsidy)

4) Human resource development (Entrustment)

In addition to research and development initiatives, this item aims to ensure the sustainable development of the overall industry in which the developed results will be disseminated. To this end, the project will undertake human resource development initiatives to develop human resources in this field who possess practical skills, problem-solving capabilities, and the ability to create markets. (Entrustment)

3) Project Structure

Project period: FY2020 to FY2029

Budget amount: 3.5887 trillion yen (total budget)

Support type: Entrustment; subsidies of 1/2 or 2/3

Legal basis under the NEDO Act: Article 15, Item 2, Item 3, and Item 9

Connections to Policies and Other Projects

- Act on Revitalization of Science, Technology, and the Creation of Innovation
- Semiconductor and Digital Industry Strategy
- Artificial Intelligence Basic Plan
- Promotion Measures for the Development of a Quantum Ecosystem
- Research and Development Project of the Enhanced Infrastructures for Post-5G Information and Communication System

Targets

1) Output Targets

Interim Target

Achieve the interim milestones established for each theme to achieve the final targets

*The theme "(g3) Development of Competitive Generative AI Foundation Models (GENIAC) (Subsidy)" under R&D Item 1 is not subject to the interim targets because its project period is short. Human resource development under Item 4 is also not subject to the interim targets because it is not itself a research and development item.

Final Target

For each component of post-5G information and communication systems, as well as manufacturing technologies, materials technologies, and other technologies for advanced semiconductors required for post-5G information and communication systems, the target is for at least 80% of themes to achieve the targets established for each development theme based on the opinions of experts.

*Number of themes that have achieved the targets established for each development theme/number of themes for which research and development has been completed by that point, excluding feasibility studies and human resource development

2) Outcome Targets

Practical application rate of technologies developed under this project: at least 50% (approx. 3 years after the completion of each adopted theme)

*Number of themes in which the developed technologies have reached practical application/number of adopted themes excluding feasibility studies and human resource development

Ministry of Economy, Trade and Industry

NEDO

Private Sector Entities

R&D Item 1 Development of Post-5G information and communication systems (Entrustment, Subsidy)

- (a) Core network
- (b) Transmission network
- (c) Base stations
- (d) MEC
- (e) Terminals
(including projects under the AI and Robotics Dep.)
- (f) Highly distributed computing
- (g) Fundamental computing technologies for expanding the computable domain
(including projects under the AI and Robotics Dep.)

R&D Item 2 Development of manufacturing technologies for advanced semiconductors (Subsidy, Entrustment)

- (a) Front-end process technologies for advanced semiconductors (More Moore technologies)
- (b) Back-end process technologies for advanced semiconductors (More than Moore technologies)
- (c) Lithography-related technologies
- (d) Next-generation semiconductor manufacturing technologies through international collaboration
- (e) Next-generation memory technologies
- (f) Next-generation semiconductor design technologies
- (g) Peripheral device design and manufacturing technologies for advanced semiconductors
- (h) Development of Advanced Semiconductor Measurement and Analysis Technologies

R&D Item 3 Feasibility study (Entrustment, Subsidy) Items Related to R&D Item 1 (Entrustment)

- (a) Network-related technologies
- (b) Transmission-related technologies
- (c) Base station-related technologies
- (d) Innovative application system technologies
- (e) MEC-related technologies

Items Related to R&D Item 2) (Subsidy)

- (a) Advanced semiconductor manufacturing technologies (front-end processes)
- (b) Advanced semiconductor manufacturing technologies (back-end processes)

R&D Item 4 Human resource development (Entrustment)

- (a) Human resource development for advanced semiconductor design
- (b) Human resource development for the industrialization of quantum computing
(including projects under the AI and Robotics Dep.)

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Research and Development Project of the Enhanced Infrastructures for Post-5G Information and Communication Systems*1			For each R&D theme, a Technical Steering Committee is held approximately once per year, as well as a Stage Gate Review Committee at the mid-term stage and other key points, and a Final Evaluation Committee after project completion*2								

*1: Interim evaluations are conducted by METI approx. every 3 years after the start of the project.
Ex-post evaluation is conducted by METI after the completion of the project.
*2: Start and end fiscal years vary by R&D theme