

The Evolution of Project Management at NEDO

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1 Introduction

- 1.1. The Act on the New Energy and Industrial Technology Development Organization (NEDO Act) states in Article 4 that the purpose of NEDO is:

to strengthen industrial technology and to promote the commercialization thereof by comprehensively performing operations such as promoting R&D carried out using skills of the private sector; promoting R&D done by the private sector with regard to technology for non-fossil energies, combustible natural gas, and coal; promoting the technology required for the rational use of energy and technology in mining and industry; and promoting the utilization of such technology in cooperation with the international community; thereby contribute to ensuring a stable and efficient energy supply in accordance with the changes in the domestic and foreign economic and social environments and to the development of the economy and industry.

- 1.2. NEDO's mission is to support the development of value-added technologies that are likely to strengthen the Japanese economy after their commercialization and real-world social implementation. NEDO does this by meticulously gathering and checking data from companies, universities, and research institutions who are working on these technologies. In addition, in response to policy directives set by the government, including from the Ministry of Economy, Trade and Industry (METI), NEDO plans and designs projects to solicit R&D frameworks for pressing challenges that require public backing. Proposals from business and academia are chosen and supported from the completion of their development stage through to commercialization. The forms NEDO's support takes are laid out in Article 4, namely: the use of entrustment contracts and the like to secure R&D that takes advantage of private sector capabilities; and the promotion of private sector R&D through grants and subsidies. Encouraging the use of the developed technologies may be carried out jointly or individually, depending on

the situation.

- 1.3. Under Article 19 of the Basic Act on Science, Technology, and Innovation, it stipulates:

The national government is to implement the necessary policies to popularize research and development results, such as appropriately protecting and disclosing research and development results and providing information about research and development, and is also to implement the necessary policies to encourage appropriate practical application and developing innovation through the practical application, in order to ensure the utilization of research and development results.

This is exactly the mission with which NEDO has been tasked; at NEDO, these activities collectively fall within the scope of project management; and NEDO has been consciously working to develop and evolve this.

- 1.4. NEDO is an innovation accelerator, nurturing the seeds of new technologies until they grow into market-ready products and services, and while this core mission remains unchanged, the scale and scope of NEDO's support have expanded significantly in the last five years. 2021 saw the establishment of the Green Innovation Fund, with eight funds overseen by NEDO for a total budget allocation of more than 10 trillion yen (65 billion USD). 1.4 trillion yen was executed in 2024, and in contrast, NEDO's execution budget totaled around 160 billion yen prior to taking over these funds. The magnitude of this change is enormous. Support has also shifted; whereas in the past, large corporations were the primary beneficiaries, it now extends to startups, small and medium-sized enterprises (SMEs), and early-career researchers.
- 1.5. At the same time, Japan has seen the development of legal frameworks such as 2023's Act on Promoting the Transition to a Decarbonized Growth Economic Structure (GX Transformation Act) and the Act on the Facilitation of Information Processing, which relate directly to NEDO's activities. Meanwhile, international changes and developments such as continuing conflicts and the trend toward protectionist attitudes by major

powers are injecting uncertainty into Japan's economic security outlook.

- 1.6. NEDO has responded to these challenges by broadening recruitment and hiring practices within the bounds of employment law in order to strengthen its organizational structure. The promotion of operational efficiency and best practices like the adoption of IT tools has meant that NEDO has thus far been able to fulfill its mission without hitting major stumbling blocks.
- 1.7. The domestic and international changes and the resulting organizational transformations should be viewed as the new normal. This means NEDO must go beyond mere reliable fulfillment of the mission it was originally tasked with and evolve its project management system to provide above and beyond added value. The midpoint of NEDO's Fifth Five-Year Plan was reached last October. In concurrence with this milestone, we would like to use this document to identify and examine the challenges NEDO faces in evolving its project management system and offer appropriate solutions.

2 Purpose of NEDO's Project Management

- 1.8. As stated above, NEDO's overarching purpose is "to strengthen industrial technology and to promote the commercialization thereof." Accordingly, project management at NEDO must be conducted with a broad perspective that encompasses industry–academia collaboration to enhance industrial competitiveness, promote the creation of innovation, and provide support for the real-world social implementation of the technology arising from each project.
- 1.9. Identifying new technological concepts that contribute to this purpose requires establishing ongoing networks with universities, companies, and research institutions in Japan and abroad. It also requires continuously gathering information on development trends in global technology. However, even when high-quality technological concepts are selected through public solicitation processes, successful commercialization after R&D is by no means guaranteed. Projects face numerous obstacles, including the uncertainty of the R&D phase, often referred to as the Devil's River; the difficulty of securing the procurement, production, distribution, and financing systems necessary for commercialization, known as the Valley of Death; and the intense competition for market acquisition, described as the Darwinian Sea.

Since NEDO's project management aims to promote commercialization, it must be carried out with a clear understanding of the necessary support to overcome these difficulties.

2. Planning and Designing Projects That Support the Innovation Ecosystem

- 2.1. There are many pitfalls which need to be avoided when it comes to planning and funding projects. For example, understanding the policy needs of individual technologies and industries is essential when designing support measures and allocating budgets, but if project planning is based solely on those understandings,

other important technological fields or industries may be overlooked and miss out on assistance, thereby undermining the effectiveness of the support measures. Another danger lies in the fact that fundamental procedures for project implementation remain the same regardless of budget. Therefore, executing projects with smaller overall funding may result in relatively higher administrative costs compared to larger projects. Moreover, if the number of applications exceeds expectations, even proposals that merit support may go unfunded due to budget limitations. Therefore, as stipulated in Article 18 of the Basic Act on Science, Technology, and Innovation, it is necessary to design policy measures that ensure R&D funds are used both effectively and efficiently.

- 2.2. When supporting innovation across different technological fields and industries, relying solely on project schemes that allocate narrowly segmented funding ceilings can result in missed opportunities for support, because once these field-specific caps are reached, worthy proposals may no longer be eligible for assistance, creating gaps in coverage. To fully leverage its capacity to support a broad spectrum of industrial technologies, including those related to energy, and to accelerate innovation as a funding agency, NEDO must ensure that fruitful research and development outcomes generated in Japan are delivered to the world in a timely manner. This requires offering a variety of project schemes that are not excessively constrained by specific fields or industries, and examining mechanisms that allow projects to be implemented efficiently.
- 2.3. As a funding agency, NEDO provides funding for entrustments and allocates subsidies, and in recent years, has also begun holding prize competitions. It additionally offers services such as consultations and advisory support. When planning and designing efficient, effective projects, we need to consider the most appropriate use of these different funding instruments.
- 2.4. Entrustment funds were originally established as expenditures for the national government to outsource administrative work or public projects to external parties, and they are paid under quasi-mandate contracts as defined in the Civil Code. They are unlike subsidies in that NEDO, as the entrusting party, bears the full cost of the necessary expenses, and any equipment or facilities purchased belong to NEDO. Because NEDO does not serve as the implementing body for research, development, or

business activities, entrustment is an appropriate instrument for certain types of work, like market trend surveys that can be referenced by many businesses, demonstration experiments conducted to review regulations, and research aimed at proposing standards or certifications. Entrustment is also suitable for the development of foundational technologies that are commonly used across an industry.

- 2.5. When it comes to subsidies, NEDO has generally covered two-thirds of eligible expenses for SMEs and startups and one-half for large corporations. Several subsidized projects are implemented through public-private collaboration, such as the Program for the Discovery and Support of Young Researchers, which aims to identify and nurture the next generation of innovators. These projects provide full funding for necessary expenses within a set ceiling.

Looking ahead, there may be cases where economic security concerns justify support beyond what private enterprises would consider rational on their own. In addition, the degree of government support may vary depending on the outlook for commercialization. In such cases, NEDO will work with METI to explore appropriate methods of providing support.

- 2.6. The final type of funding NEDO provides is in the form of challenge prizes, and the “NEDO Challenge” program has recently been launched in earnest. Challenge prizes are designed with clearly defined achievement goals, but do not specify technologies or methods. The program offers predetermined monetary awards to those who successfully meet these goals in an outstanding manner. Unlike entrustment or subsidy projects, which require reporting and auditing of actual expenditures, these awards do not require recipients to declare or verify their spending. If the cost of R&D is less than the prize amount, the recipient is free to use the surplus for future research or other purposes.

However, universities and startups may not have sufficient capital to participate in challenges that involve significant upfront investment, such as prototyping physical products or acquiring new equipment. In such cases, complementary measures like additional funding or access to shared equipment may be necessary. Recognizing these unique characteristics not found in traditional entrustment or subsidy contracts, NEDO

will continue to explore the broader use of challenge prizes as a means of identifying those with promising ideas and technologies and unlocking the commercialization potential of technologies embedded within companies.

- 2.7. The required amount of funding for each selected project, whether provided through entrustment funding or subsidies, varies depending on the industry and technological field. The types of support needed also differ accordingly. To ensure that businesses aiming to carry out technology development projects are not left without the support they require, it is important that each business can flexibly choose from a cafeteria-style menu of support options according to its specific circumstances. With this in mind, NEDO continues to refine how it solicits project proposals.
- 2.8. NEDO's public solicitation for subsidy and entrustment projects is broadly divided into two categories, depending on the particular intent of the policy program or project: the challenge-driven type, which sets out specific development issues in advance, and the open-theme type, which invites a wide range of proposals without predefined constraints. In both cases, minimizing the burden on those preparing submissions ensures that proposals with potential economic and social benefits can be gathered swiftly from a wide range of applicants.

To enhance transparency in the screening process and build greater confidence among applicants, NEDO is currently piloting a staged project formation approach. Inspired by mechanisms such as DARPA and ARPA-E in the United States, this approach begins with a public solicitation for concise proposals in the form of a Request for Information, followed by invitations for full proposals from those with the most promising ideas. Looking ahead, NEDO will take into account the results of these trials and consider expanding such initiatives in line with the nature of each project.

- 2.9. NEDO's support is not limited to the allocation of financial resources in the form of subsidies, entrustments, or challenge prizes. The goal of NEDO's project management mission is to promote the commercialization of R&D outcomes. In order to achieve this, NEDO seeks to enhance its support activities beyond simple progress monitoring during the implementation of each selected project. For example, after project completion, NEDO aims to strengthen its commercialization support beyond

conventional follow-up surveys. This will allow us to explore ways to clarify and streamline budget execution procedures in response to requests from project participants.

- 2.10. The government employs varied mechanisms to allocate budgets to NEDO for each project; they may come in the form of operational grants or funds, or through the initial or supplementary national budget, but even when the budgetary classifications differ, the challenges outlined above remain the same. Therefore, NEDO will work with METI to ensure that its support is delivered based on a coherent policy approach.

3. Enhancing Project Management During Project Implementation

- 3.1. NEDO must remain especially mindful that the funding it distributes comes from taxes and other valuable public resources, as stipulated in Article 3 of the Act on Regulation of the Execution of Budget Pertaining to Subsidies. NEDO is therefore obligated to ensure that such funds are used fairly and efficiently in accordance with relevant laws and budgetary provisions.
- 3.2. However, NEDO's support does not have to stop at keeping projects on track and managing budgets. For innovative technologies to reach commercialization, novelty and quality are not the only ingredients. It is also essential to have sound marketing strategies that anticipate future revenue, well-developed business plans, and capable management structures driven by committed leadership. In many cases, some or all of these factors may be underdeveloped, and companies may face challenges that they cannot overcome on their own. It is precisely in such situations that the value of NEDO's public funding becomes evident, even while expecting companies to take responsibility for establishing internal systems that ensure allocated funds are properly used for research and development.
- 3.3. For example, commercially viable technologies must survive mass production and cost reduction without compromising the performance demonstrated at the lab scale. Even

the most innovative technology will not reach the market unless there is a clear business model that defines how products or services that use it will be delivered and who will use them. Furthermore, for new technology to be incorporated into a product or service and brought to market, companies must plan production systems, distribution chains, sales networks, and customer support. Company leadership must also clearly express their determination to commercialize the technology, even in the face of risk, and reflect that commitment in their management policies and business plans.

- 3.4. NEDO must work closely with project participants to help them overcome these challenges. We need to partner with them to address R&D issues, share concerns, and facilitate problem-solving. At times, NEDO must also be prepared to recommend difficult decisions, such as course corrections or even project cancelation, and we may need to provide guidance on intellectual property strategies and standardization. These efforts help companies build ecosystems and partnerships that allow them to leverage their strengths while taking into account open and closed innovation strategies. When regulatory or institutional barriers hinder progress, or when new markets need to be created through policy mechanisms, NEDO may even make proposals or coordinate with relevant government ministries and agencies.
- 3.5. There may be cases where NEDO's support is needed even before funding is provided. For instance, this could include market research to assess demand and strategize, or capacity building to strengthen leadership and organizational management.
- 3.6. More often than not, NEDO possesses less technical expertise than the project participants themselves, and there are also inherent limitations in fully understanding their internal management conditions. In light of these challenges, NEDO is considering adopting an approach known as process consultation to strengthen the ability of its project managers to provide hands-on support. Process consultation, originally developed by Edgar H. Schein, has experienced a recent surge in popularity, because it is a support method that focuses on "active listening" and "humble inquiry." This approach emphasizes building a relationship of trust in which the supported party feels comfortable sharing all necessary information. Rather than offering direct solutions, the

role of the supporter is to guide the supported party in discovering their own answers. Process consultation is also considered effective for expanding support activities after project implementation.

- 3.7. In the future, NEDO's project management must seamlessly cross domestic and international boundaries and be conducted with a truly global perspective. With Japan's ongoing population decline the domestic market is expected to shrink across many sectors, but targeting global markets from the outset through the R&D activities it funds can enhance the impact of NEDO's support. Moreover, as it becomes increasingly difficult for any single country to achieve innovation on its own, it is essential to pursue international collaborative R&D that integrates advanced technologies and expertise from around the world. Conversely, it is equally important to support international expansion of Japanese technologies that demonstrate a competitive advantage and strong potential for deployment in specific countries or regions.

4. Strengthening Post-Project Commercialization Support

- 4.1. To fulfill NEDO's project management objectives, it is essential to bolster efforts that go beyond project completion, ensuring that project outcomes are successfully commercialized and deliver tangible benefits to society and the economy. In the past, post-project activities have focused primarily on follow-up surveys to track commercialization progress. Going forward, however, NEDO will take a more proactive role in facilitating the transition to market.
- 4.2. Achieving commercialization requires a wide range of efforts that go beyond the scope of R&D, such as securing human resources, establishing production and sales systems through capital investment, conducting public relations activities, leveraging policy frameworks for support, and raising the necessary funds. In recent years NEDO itself has undertaken initiatives to support commercialization, such as providing subsidies for capital investment in semiconductor manufacturing equipment, strengthening supply chains for economic security, and supporting startups with capital investments.

In addition to these efforts, it is important to provide SMEs and startups with information on capital investments, loans, and equity investment programs offered by other public institutions and to connect them with the appropriate points of contact. Depending on the size of the business and the characteristics of the target market, it may also be necessary to engage with relevant policy authorities to advocate for regulatory clarification or reform. NEDO should also consider actively leveraging the expertise of specialized institutions and professionals to conduct research on technology trends and needs, support human resource development, provide guidance on intellectual property and standardization systems, and introduce support measures offered by other public institutions.

- 4.3. Attracting private investment in startups and SMEs requires expanding NEDO's activities to communicate R&D outcomes to investors and large corporations and promote business matchmaking.
- 4.4. To encourage national and local governments to become the first customers to procure new technologies, NEDO should strengthen its communication with public institutions that are exploring their use. It is also important to organize and present R&D outcomes by application area so that these institutions can easily identify technologies that meet their needs. In addition, NEDO should actively listen to the challenges faced by the public sector and help connect organizations with companies capable of providing practical solutions.

5. Enhancing Service Quality Initiatives

- 5.1. NEDO's project management can only move forward if we actively solicit and carefully listen to feedback from project participants and if this feedback is reflected in ongoing improvements. To this end, surveys should be reviewed in terms of their scope and content, and participants' requests should be promptly considered and addressed. Once improvement measures are determined they should be implemented without delay, and efforts should be made to shorten the PDCA cycle for more responsive service enhancement.

6. Organizational and Human Resource Development to Advance NEDO's Project Management

- 6.1. As outlined above, advancing NEDO's project management requires significant expansion in terms of both scope and quality. This means going beyond conventional project execution oversight to include project planning and design, hands-on support during implementation, and post-project commercialization assistance. In light of this broader role, it is necessary to reconsider whether staffing levels based solely on the size of subsidies and entrustments are sufficient. Taking into account current employment conditions, NEDO will work with METI to assess and enhance our human resource structure where necessary. NEDO and METI share the view that the true added value of NEDO lies in its ability to allocate funding under this evolved project management framework, and we will translate this shared understanding into concrete actions.
- 6.2. NEDO's human resource development programs have traditionally treated project management as a single domain. These will have to be strengthened in line with the diversification of activities. Personnel responsible for project planning and design will need not only a broad understanding of NEDO's operations but also a solid grasp of budgetary rules and procedures including the Public Finance Act and the Act on the Regulation of the Execution of Budgets Pertaining to Subsidies. In particular, NEDO must ensure that its tenured staff gain broad experience across various project management activities and back-office operations as part of their career development.

For commercialization support, NEDO will draw on examples such as ARPA-E, where personnel with expertise in business and market analysis, known as Technology-to-Market (T2M) specialists, work in collaboration with R&D staff to provide companies with insights into investor perspectives and potential markets. Building on such models, NEDO will seek to secure personnel dedicated to commercialization support, including by engaging external experts.
- 6.3. In addition to using external service providers for back-office operations, NEDO will

consider deploying them for parts of project management where greater efficiency and effectiveness can be achieved. NEDO also plans to make active use of external experts with specialized knowledge and experience in key areas of project management, such as process consultation, intellectual property rights, and standardization.

7. Ongoing Reform of Project Management Operations

7.1. While applications for subsidies and entrustments have already been fully digitalized, NEDO will continue to streamline administrative processes to further reduce burdens on applicants. As part of this effort, NEDO plans to introduce the G Biz ID system, a unified digital identification platform commonly used for national and local government support programs in Japan. Applicants only need to enter their basic information once under this system, simplifying the application process. A dedicated app from NEDO will lead to further streamlining and improve the delivery of notifications. Looking ahead, the use of generative AI to support application procedures is also under consideration. Online meetings will continue to be actively used for consultations and expert reviews to reduce the burden on supported businesses and avoid delays. Furthermore, to make effective use of data obtained through support activities, NEDO will develop an integrated database with strong information security measures to allow for the analysis of accumulated data in combination with external datasets.

8. Strengthening Back-Office Capacity

8.1. In parallel with the advancement of project management, NEDO will also enhance the structure and human resource development of its back-office functions. So that project staff can focus fully on frontline activities, administrative procedures will be consolidated within the relevant management departments wherever possible. Efforts to reduce administrative costs will continue through further digitalization, automation, and the use of outsourcing.

3 In Conclusion

- 8.2. Based on the above policies, NEDO will work with METI to develop and implement specific measures under a new initiative, tentatively titled the Project Management Advancement Plan. NEDO will at the same time formulate new project management guidelines to serve as a practical reference for staff engaged in various project management activities.
- 8.3. As further changes in the external environment arise and new insights are gained through data analysis, this document will be subject to continuous review and updating as necessary, and the same applies to the Project Management Advancement Plan and project management guidelines. NEDO will continue to draw on the diverse backgrounds, experiences, and creativity of its staff to ensure these materials remain relevant and effective.
- 8.4. Through the advancement of project management, NEDO aims to provide seamless support from research and development to commercialization, and to establish itself as a truly unique and indispensable funding agency.