

Establishment of the Moonshot Research and Development Program

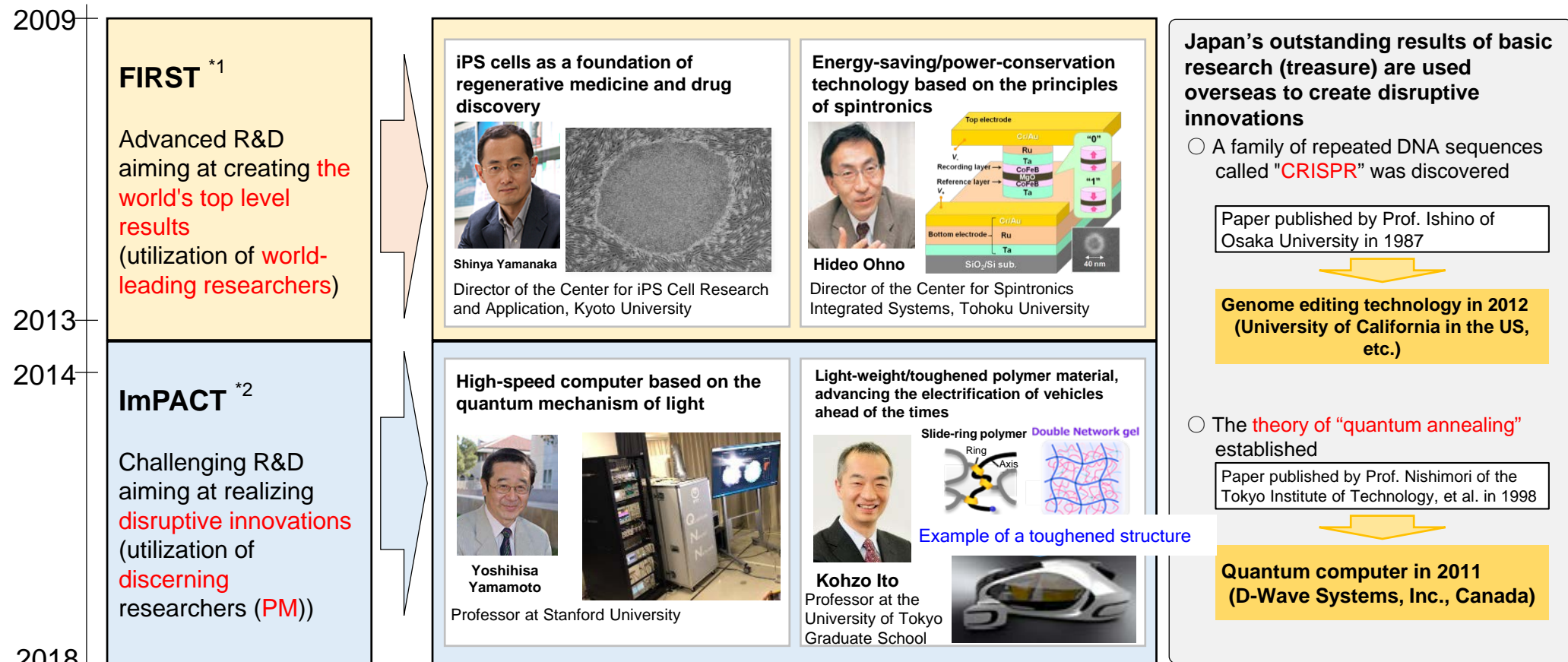
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Director General for Science, Technology and Innovation,
Cabinet Office



Challenge to Create Disruptive Innovations

- In Japan, there have been **numerous creative research results produced in basic research areas**, which have potential to transform future industries and society (**creation of disruptive innovations**).
- However, a research and development system to swiftly implement such research results for industries and society, and globally deploy them has yet to be developed.



*1: Funding Program for World-Leading Innovative R&D on Science and Technology (from 2009 to 2013)

*2: Impulsing Paradigm Change through Disruptive Technologies Program (from 2013 to 2018)

Rapidly-Evolving R&D Trends Overseas

- With an aim at becoming the leader of disruptive innovations, other countries are drawing in top researchers from around the world and **increasing their investment in challenging R&D**, targeting ambitious concepts and difficult social issues. In addition, **private investment** leading the results of their research to business startups and business creation has been **stimulated**. Under clear open & close strategies, **international cooperation has also been promoted**.

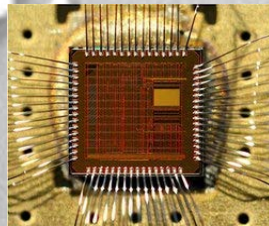
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- ✓ **Expanding public investment in high-risk research, etc.** (€2.7B [350 billion yen] in 3 years)
- ✓ Oriented to **international collaboration and interdisciplinary research** under Horizon 2020
- ✓ **Planning the next project, Horizon Europe (€100B [approx. 12 trillion yen] during 2021 to 2027)**

Fuel from the Sun
(artificial photosynthesis technology)



Prediction of future spread of infectious diseases
(**pandemic prediction**)



Neuro-computer
that imitates the cranial nerve system

<China>

- ✓ Accelerating the development of its AI industry by laying out the innovation policy "**Made in China 2025**," etc.
- ✓ **Expanding investment in basic research**

Communications satellite "Mozi" using **quantum encryption technology**



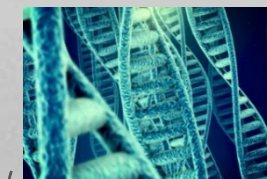
<US>

- ✓ Sequentially developing key technologies for disruptive innovations, such as **AI and genome editing technology**
- ✓ **Investment in challenging development by such big tech companies as GAFA** (so-called platformers)
- ✓ **Developing business by utilizing results produced by the DARPA**
(voice recognition software "Siri," robotic surgical system "Da Vinci")
- ✓ **Enhancing support for challenging basic research with a focus on important national issues**
(NSF 2050 Fund)

The Apollo Project of the Brain
(Brain Initiative)



Immediately available **space transportation vehicle**



Shedding light on the complex and mutual mechanism between **living organisms (genes) and the environment**



Creation of future work by utilizing **AI and robotics**

Outline of the Moonshot Research and Development Program

- With this situation taken into consideration, the **newly established Moonshot Research and Development Program** is to develop a **mechanism to gather the wisdom of scientists all over the world and enable relevant administrative organs to work in a unified manner on implementing challenging R&D**, with an aim at resolving various difficult issues that Japan faces, including the progress of aging of society with a low birth rate, preparations for large-scale natural disasters, and global warming.
- In particular, rather than research that merely combines existing technologies, challenging R&D that incorporates **creative knowledge and ideas at their basic research stages** (moonshot) will be actively promoted in order to **unearth innovative research results** while tolerating failures and thereby create disruptive innovations.

<Key Points of the Program>

1. Aims at realizing **fascinating and ambitious concepts** and **gathering the wisdom of researchers all over the world**

→ *Creates innovations in a global environment!*

2. **Maximizes the basic research capability** of Japan, and discovers and cultivates innovative research results while **tolerating failures**

→ *Japan's original basic research produces innovations and thereby aims at achieving a virtuous cycle to attract further investment in basic research!*

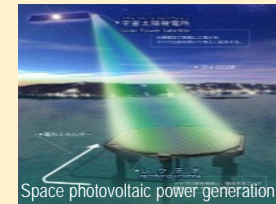
3. **Renovates research management techniques**, constructs a **leading-edge research support system, thoroughly implements the open & close strategy**, etc.

→ *Switches to speedy and aggressive research management with global trends constantly taken into account!*

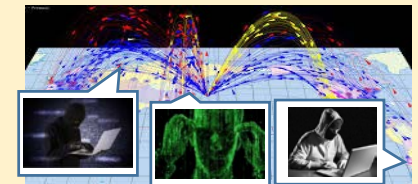
Under the leadership of the CSTI as the control tower, relevant administrative organs work in unity on implementing the Program

For example...

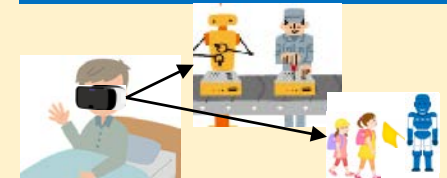
Stop global warming



Neutralize cyberterrorism



Extend the "social participation lifespan"



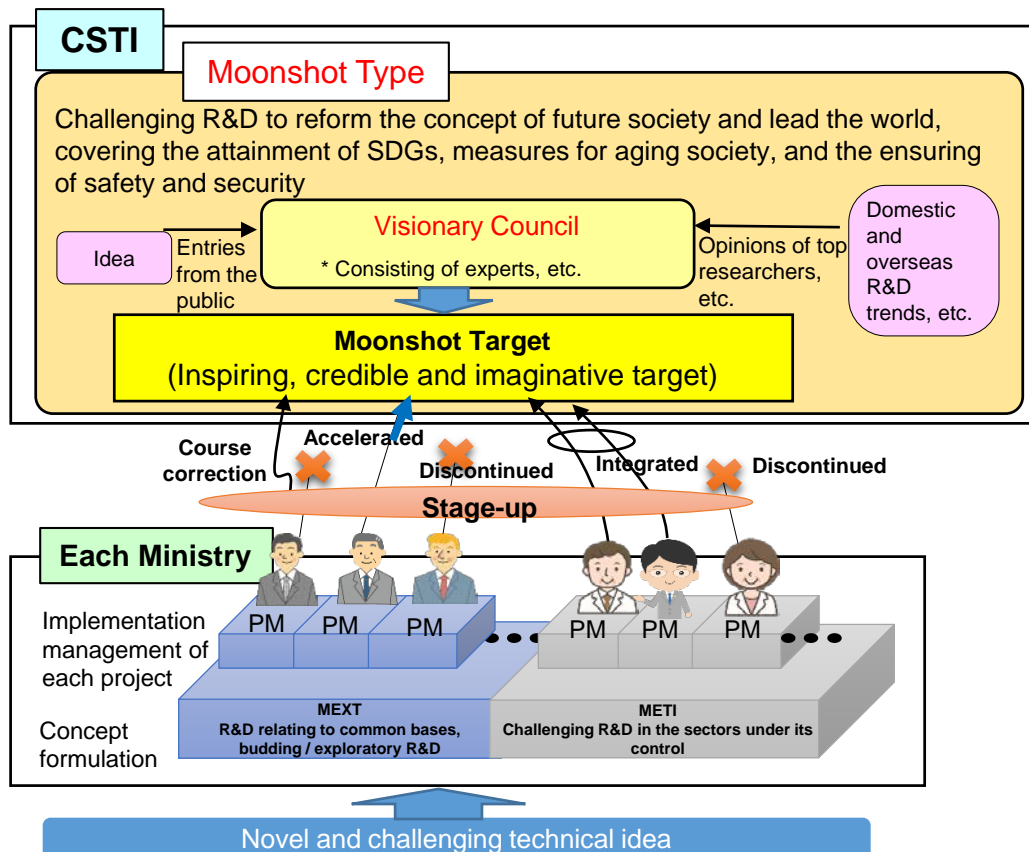
Enabling bedridden elderly people to participate in social activities

Allocation of Relevant Budget

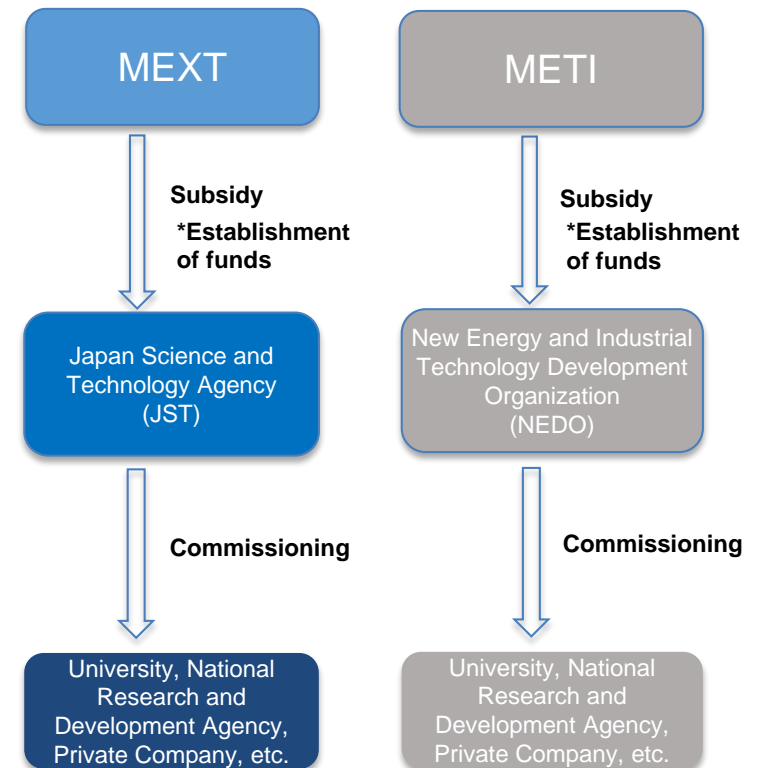
○ The budget required for the promotion of this Program is allocated to the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and the Ministry of Economy, Trade and Industry (METI) as follows:

- (1) 100 billion yen from the second supplementary budget for FY 2018 (80 billion yen for the MEXT, 20 billion yen for the METI)*¹
- (2) 2 billion yen from the budget for FY 2019(1.6 billion yen for the MEXT, 400 million yen for the METI)*²

[Framework of the Program]



[Fund Flow]



*1 (MEXT) Moonshot Research and Development Program (METI) Moonshot Research and Development Project

*2 (MEXT) Moonshot Research and Development Program (METI) New Technology Pioneering Research Program for New Industry Creation

Implementation Structure

- With regard to a social issue that is expected to lead to a significant impact if it is, albeit difficult, overcome, the **CSTI** **draws** an image of future society (**moonshot target**), and the JST/NEDO **widely advertises** for novel research ideas (**programs**) for attaining the target **from domestic and overseas researchers, etc.**
- For the implementation management of an individual program, **a top researcher, etc. is appointed as the Program Manager (PM) to manage the program flexibly** according to its progress and overseas trends. At the same time, **cooperation is sought from external experts, and relevant administrative organs provide support for the program in an integrated manner.**

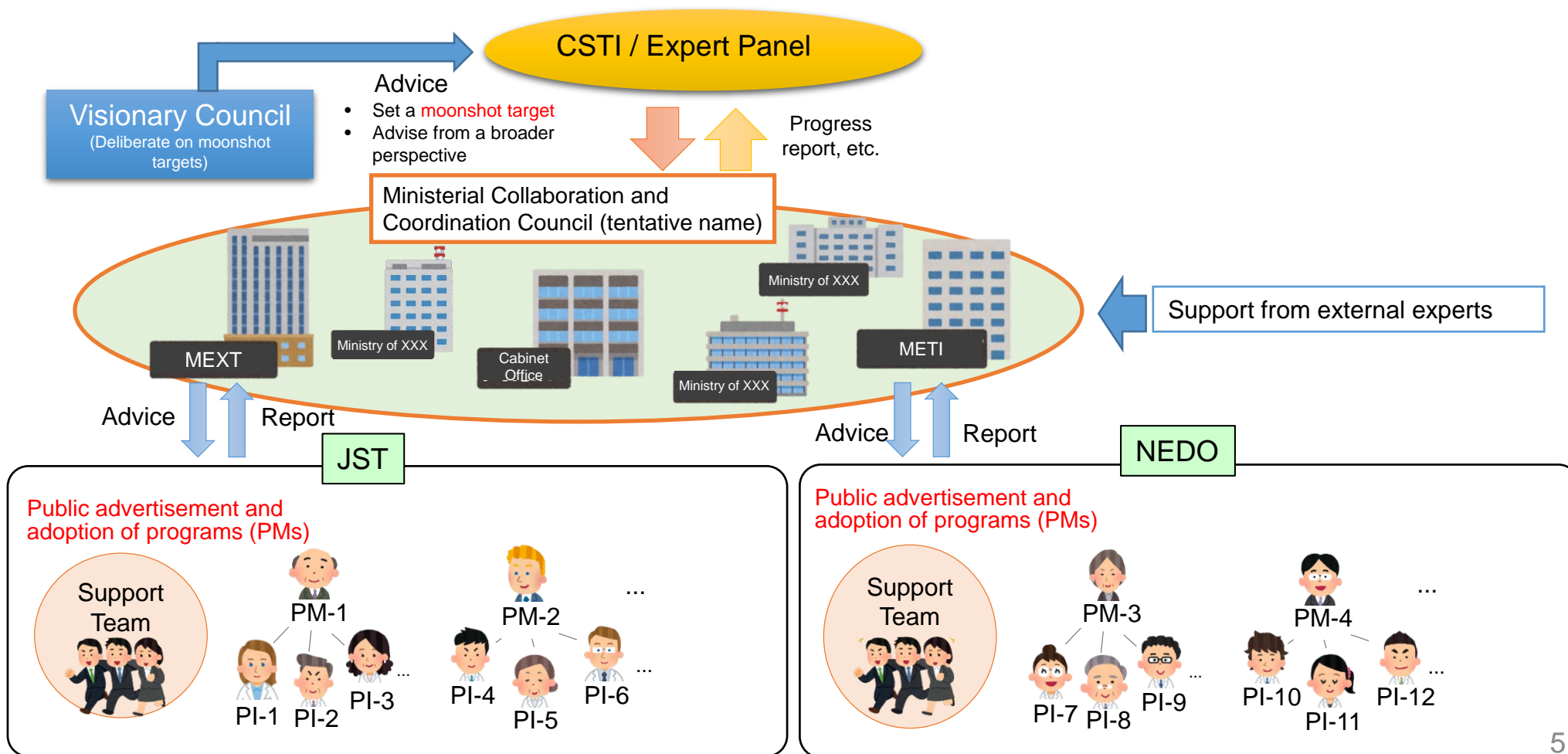
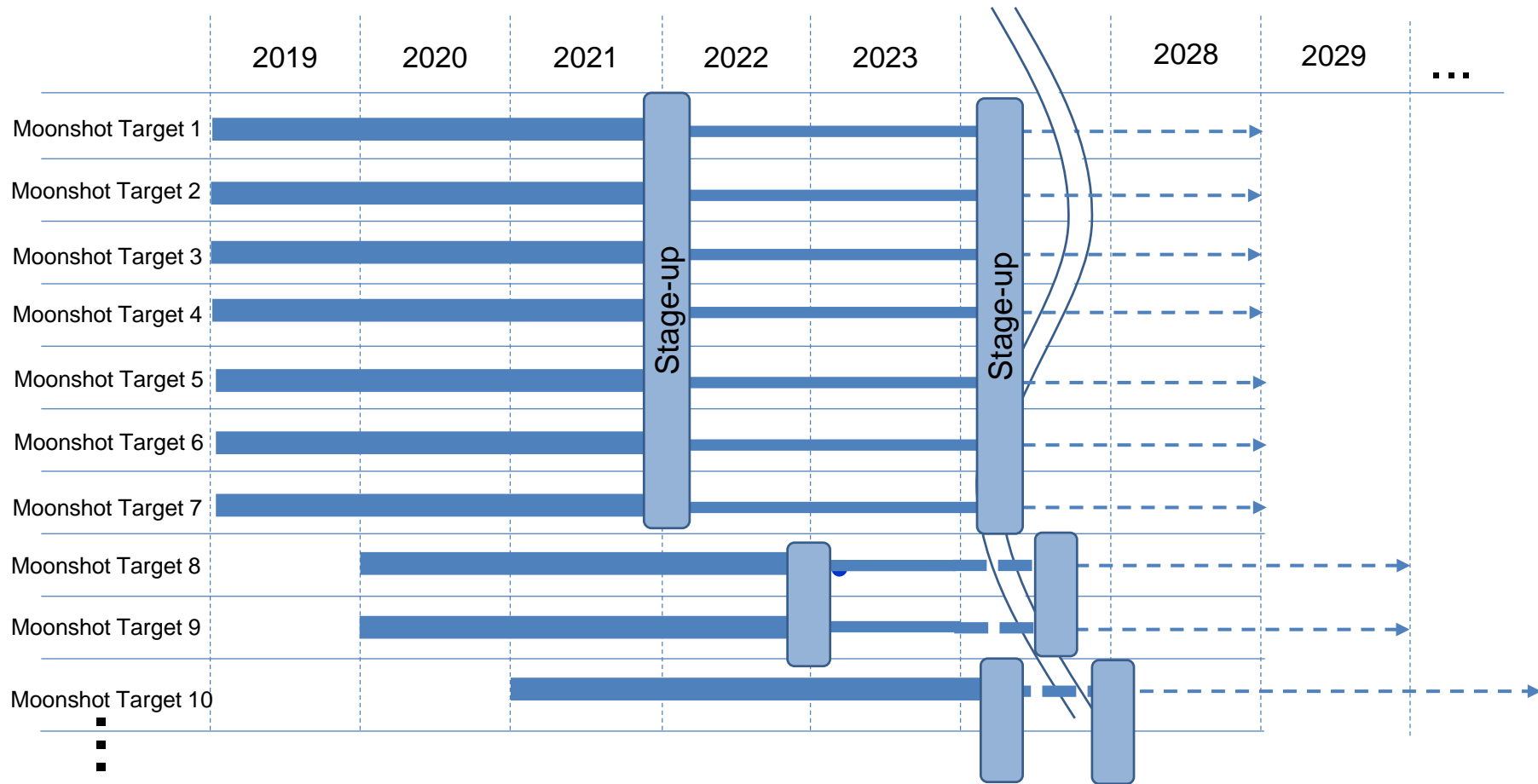


Image of Moonshot Research Implementation

- Moonshot targets are **set on the basis of ideas offered through public advertisement, and on a continuous basis**. Government-wide R&D systems can be transformed into more open, global and aggressive systems by **relevant administrative organs continuously working in unity on open initiatives each year under the leadership of the CSTI**. Taking on challenges without fear of failure will produce social momentum.
- In addition, by taking advantage of the funding system based on the recently enacted “Act on the Activation of Science, Technology and Innovation Creation,” **robust programs, for which support is available for a maximum of 10 years, will be implemented**.



Incorporation of Diverse Knowledge and Ideas from Basic Research

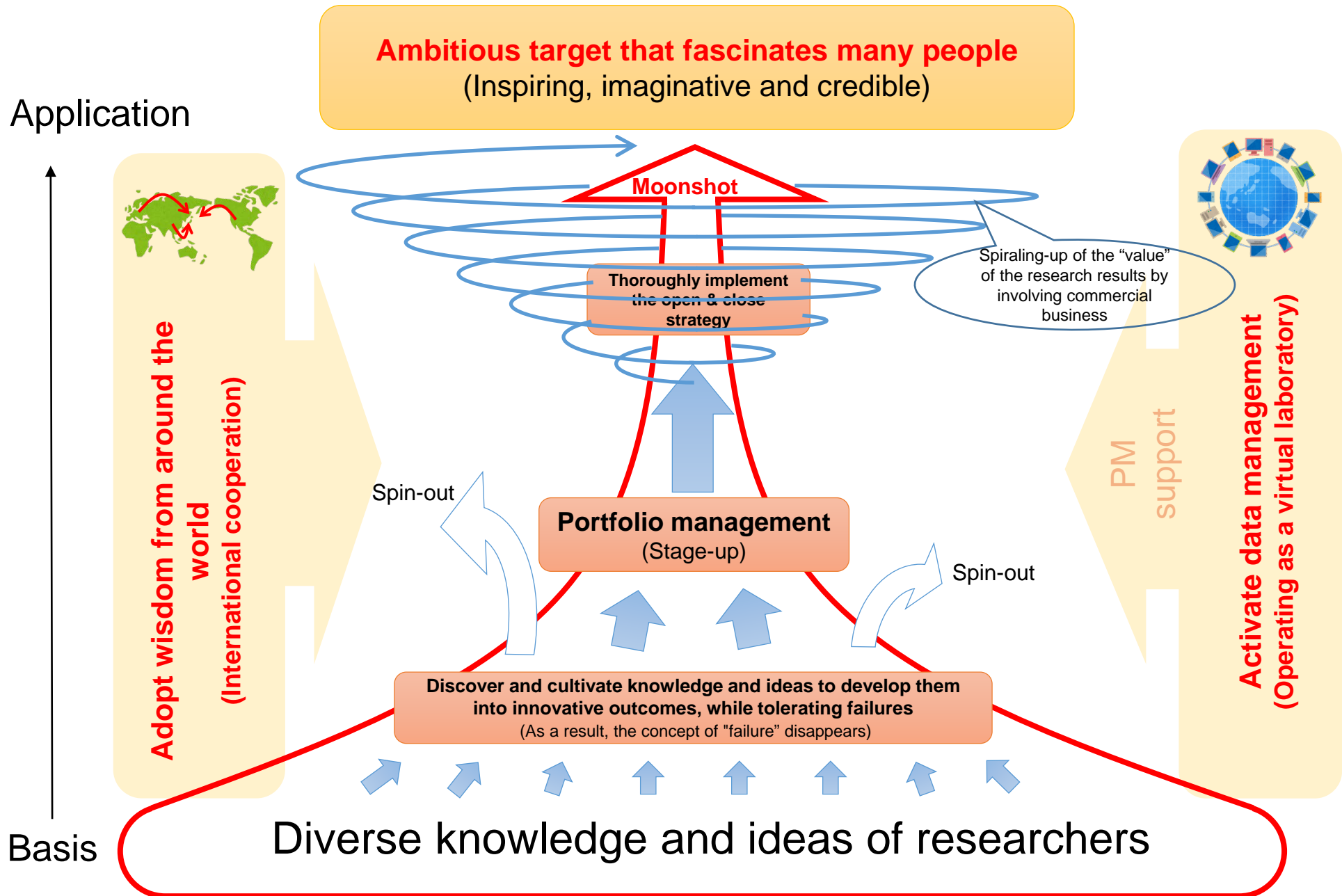
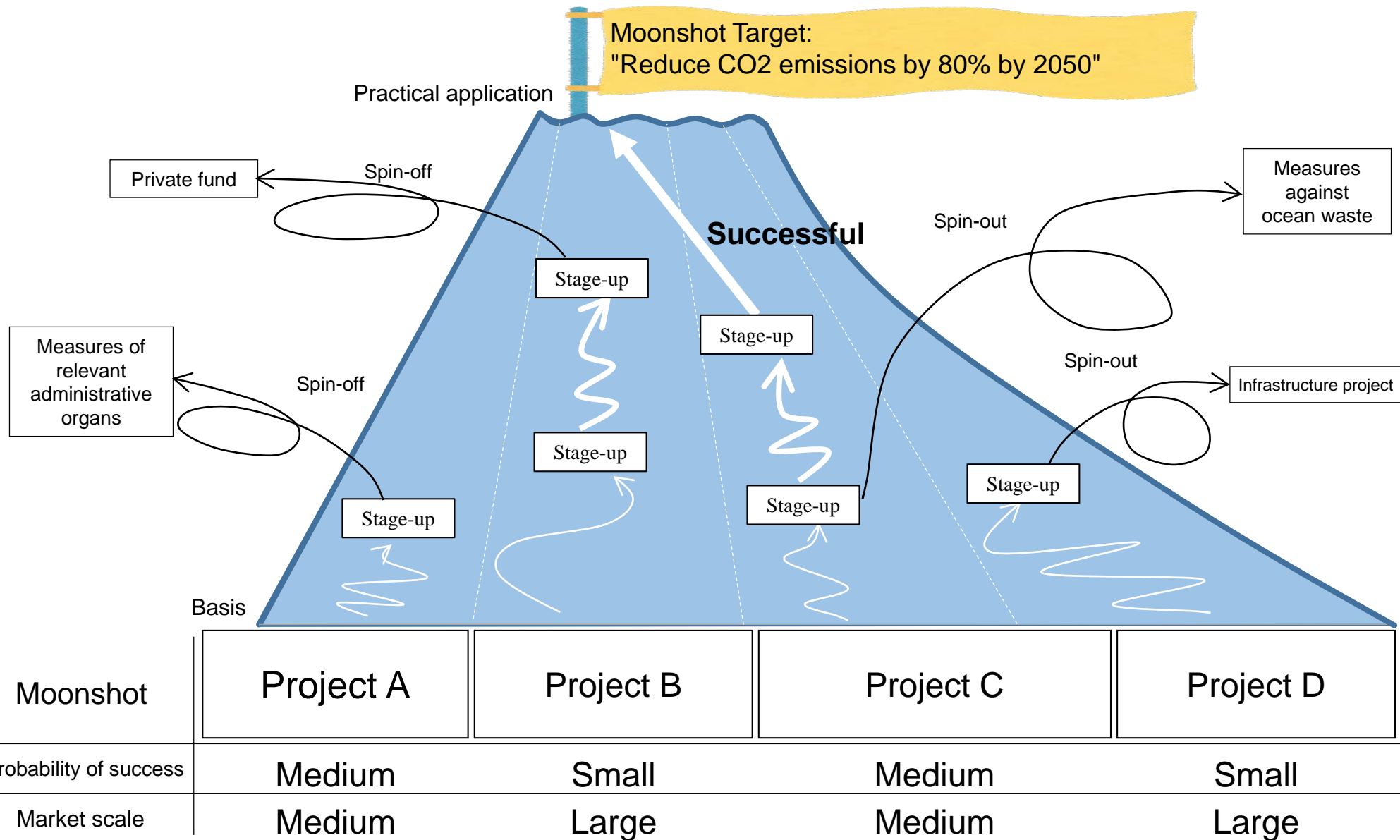


Image of a Portfolio for Attainment of a Moonshot Target



Note: The Moonshot Research and Development Program targets challenging R&D based on ventures ideas that are not regarded as an extension of conventional technologies. Furthermore, relevant administrative organs implement the Program in an integrated manner and according to the progress of R&D, for example, by acting as a mediator between the Program and measures under the jurisdiction of relevant headquarters or administrative organs, where necessary.