

NEDO's activities toward expansion of floating offshore wind power generation

New Energy and Industrial Technology Development Organization (NEDO)

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1-1 About NEDO

New Energy and Industrial Technology Development Organization

156.8 Billion yen

NEDO aims to address energy and global environmental problems and raise the level of industrial technology through the integrated management of technological development. This ranges from the discovery of technology seeds to the promotion of mid- to long-term projects and support for practical application.

(FY2022 tentative budget) ※As only an outline of NEDO's activities is given below, individual budget amounts do not add up to the total.

Energy Systems

57.7 Billion yen

Energy Conservation and Environment

41.7 Billion yen

Industrial Technology

42.7 Billion yen

New Industry Creation and Discovery of Technology Seeds

7 Billion yen

Areas of focus

- System provision technology
- Energy storage technology, such as batteries
- Technology related to hydrogen production, storage, transport, and use
- **Renewable energy technology**

※In addition to the above, the following programs will be funded and conducted as publicly solicited research and development projects.

- Moonshot Research and Development
- Research and Development Project for Enhancement of the Bases for Post-5G Information and Communication Systems
- **Green Innovation Fund Projects**
- Program for Developing Important Economic Security Technologies
- Programs for Specified Semiconductor Production-Related Development

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2-1 Vision for Offshore Wind Power Industry (1st)



Significance & challenges in offshore wind power generation

- Offshore wind power generation is expected to be **(1) introduced on a large-scale, (2) reduce costs, and have (3) economic ripple effects**, and holds the key to making renewable energy a main power source.
- As introduction of wind power gains momentum worldwide**, with a focus on Europe, **rapid growth is expected in the Asian market in the future**, especially in China, Taiwan, and South Korea.
(**Total global capacity** is expected to **increase from 23GW in 2018 to 562GW in 2040 (24-fold increase)**)
- Currently, most **offshore wind power manufacturers are located overseas, but there are potential suppliers in Japan as well.**

Basic Strategy on the Enhancement of Industrial Competitiveness for Offshore Wind Power Generation

1. Attractive domestic market creation

2. Investment promotion and supply chain establishment

3. Next-generation technology development and cross-border collaboration

Target setting by public and private sectors

(1) Clear introduction of targets set by GOJ

- 10GW by 2030
- 30-45GW by 2040

(2) Acceleration of offshore wind project development

- Introduce a GOJ-led push-type project scheme (Japan Centralization)

(3) Systematic establishment of infrastructure

- Detail-out first draft of Grid Master Plan
- Consider options for DC power transmission
- Systematically develop ports and harbors

(1) Setting of targets by the Industry

- Increase Japan content to 60% by 2040
- Reduce cost of fixed-bottom offshore wind turbine-generated power to 8-9 yen/kWh by 2030-2035

(2) Strengthening of supplier competitiveness

- Evaluate initiatives that contribute to stable power supply in public tender
- Support capital investment through subsidies, tax breaks, etc. (under review)
- Promote matching of overseas and domestic companies (via JETRO, etc.)

(3) Establishment of business infrastructure (review regulations/standards)

(4) Offshore wind power talent development program

(1) Development of next-generation

technologies for floating offshore wind, etc.

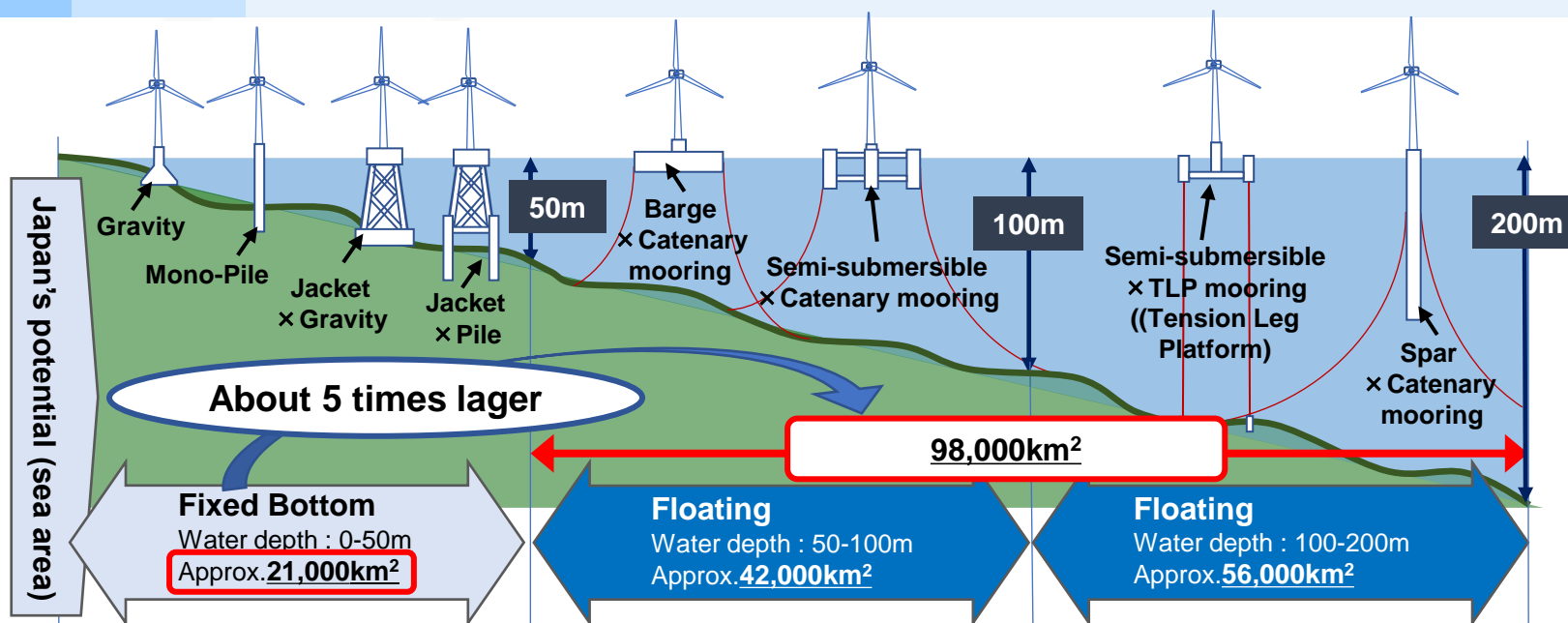
- Formulate "Technology Development Roadmap"
- Support technological development through use of a fund

(2) International standardization, bilateral dialogue, etc.

- Standardize rules globally
- Engage in bilateral dialogue for future markets
- Provide public financial support

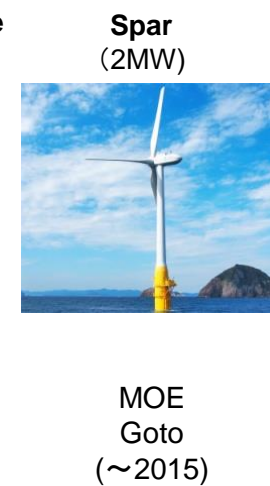
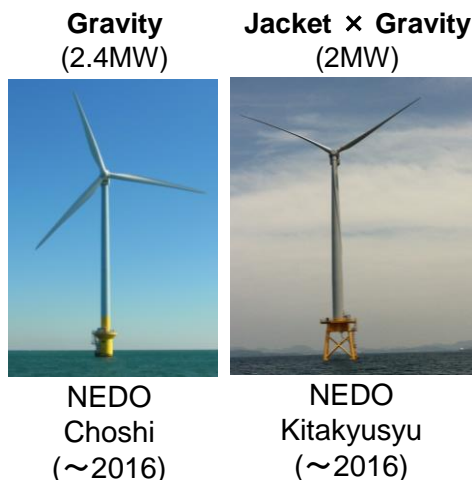
Source: Public-Private Council on Enhancement of Industrial Competitiveness for Offshore Wind Power Generation

2-2 Offshore Wind Power Foundations type and Potential(Area) in Japan



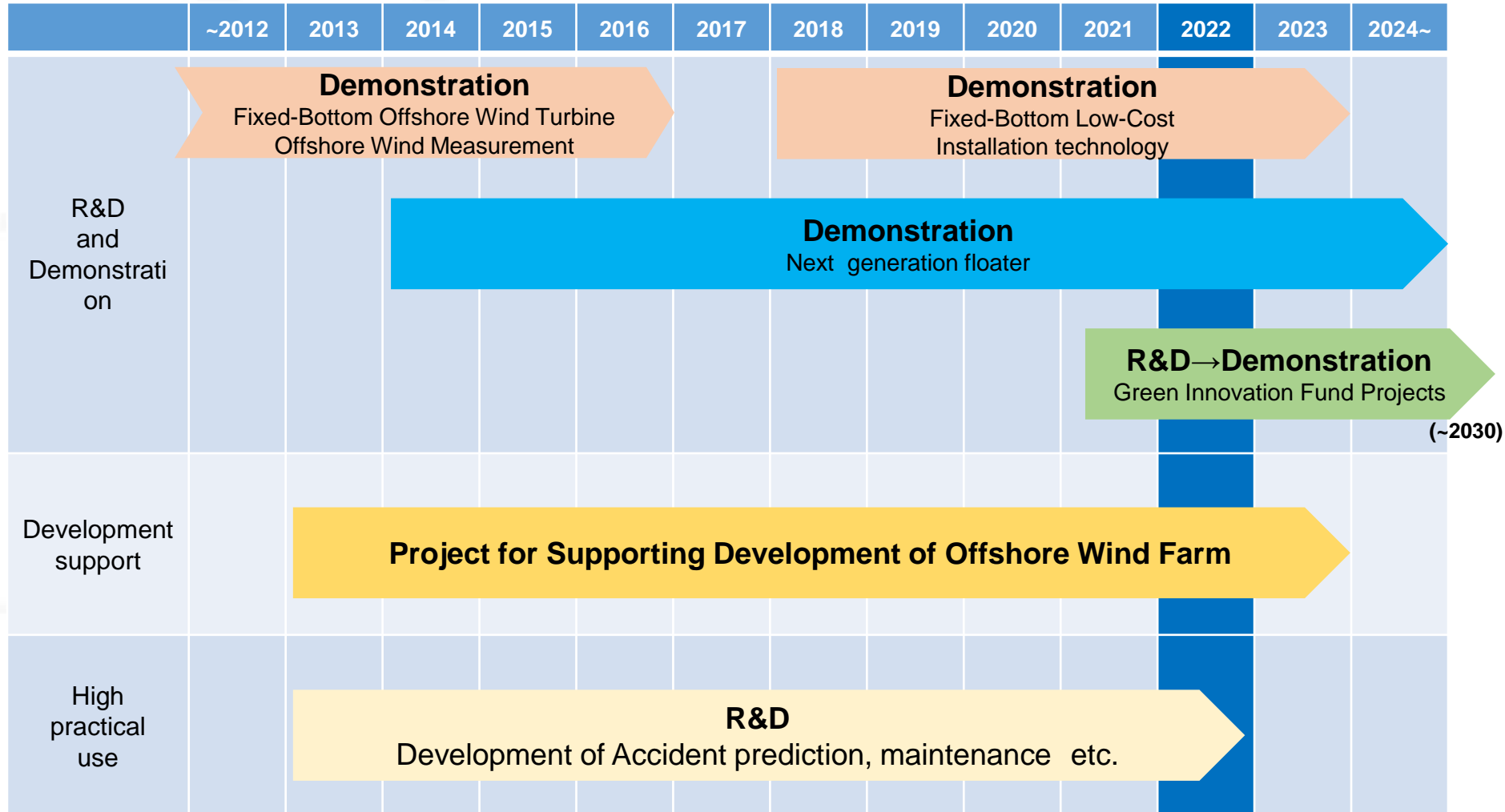
※1 The sea area is estimated based on the offshore distance of less than 30km, excluding social constraints, and an annual average wind speed of 7m/s or higher.

※2 The position shown in the figure for the floating type is not the applicable range or the optimal water depth.

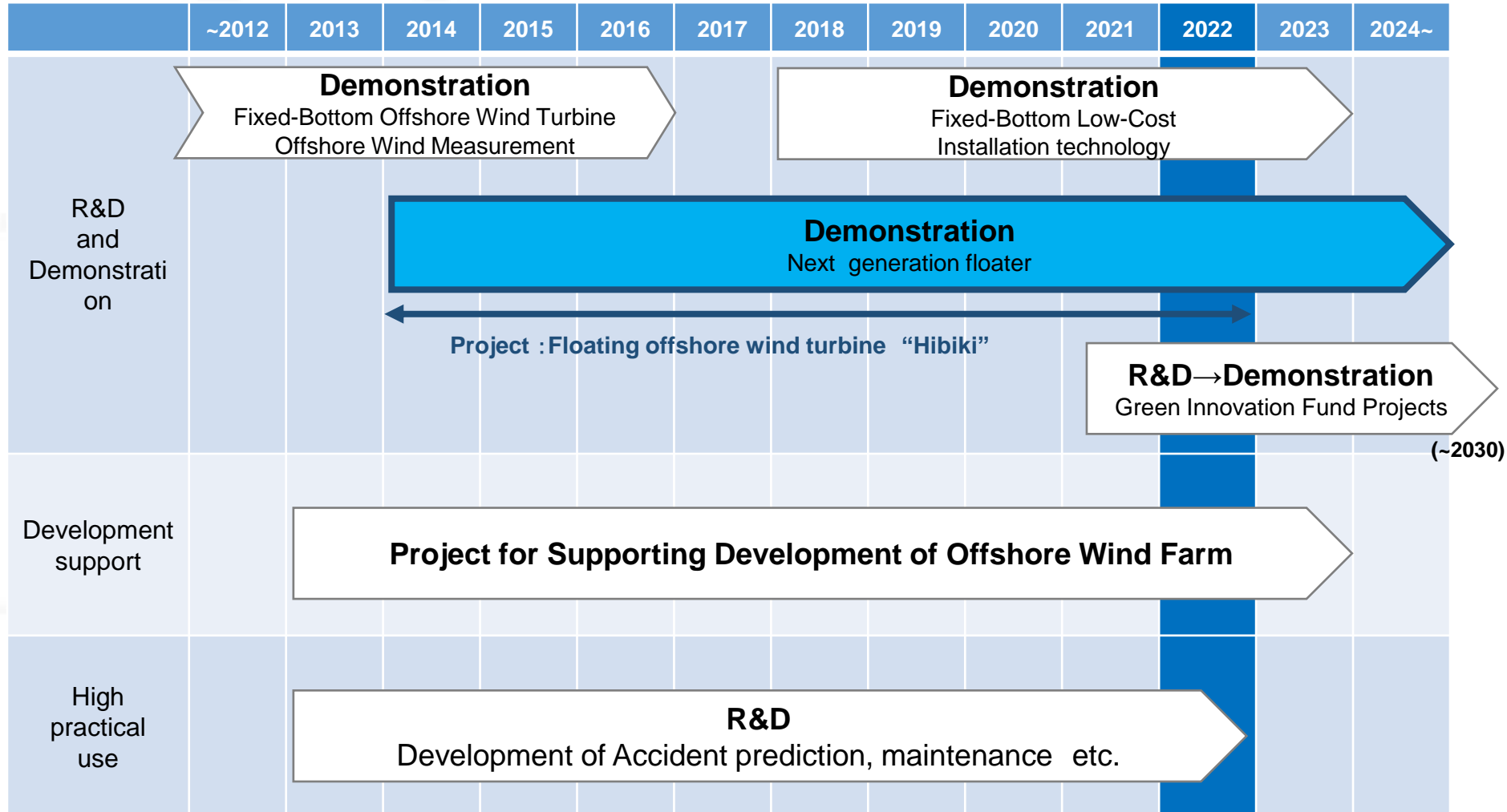


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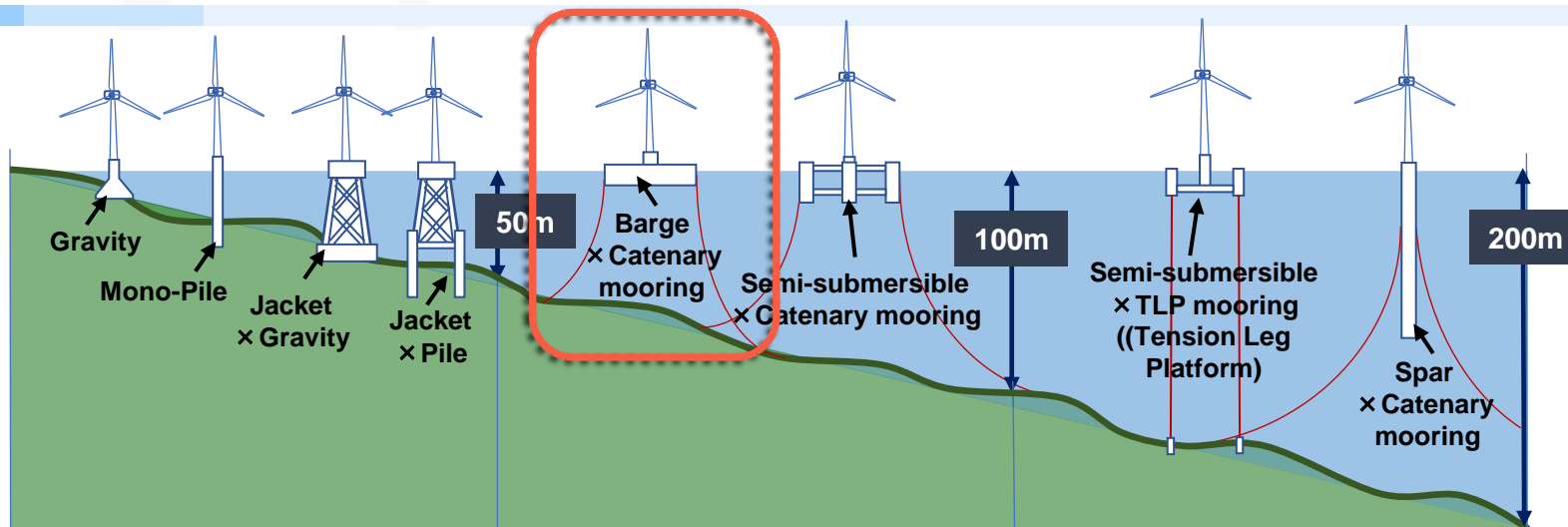
3-1 NEDO's Offshore Wind Development Projects



3-2 NEDO's Offshore Wind Development Projects



3-2 Floating offshore wind turbine: Hibiki ~Offshore Wind Power Foundations type ~



Gravity
(2.4MW)



NEDO
Choshi
(~2016)

Jacket x Gravity
(2MW)



NEDO
Kitakyusyu
(~2016)



**NEDO Project (Barge Type)
Hibiki**

Semi-submersible
(2MW等)



METI
Fukushima
(~2020)

Spar
(2MW)



MOE
Goto
(~2015)

3-2 Floating offshore wind turbine: Hibiki (Barge Type)



【Project member】

Marubeni Corporation

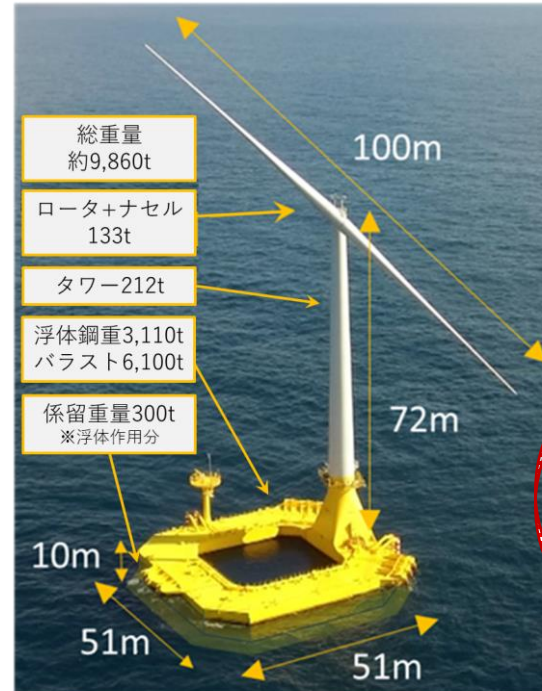
Hitachi Zosen Corporation

The University of Tokyo

GLOCAL INC.

Kyuden Mirai Energy Company, Incorporated

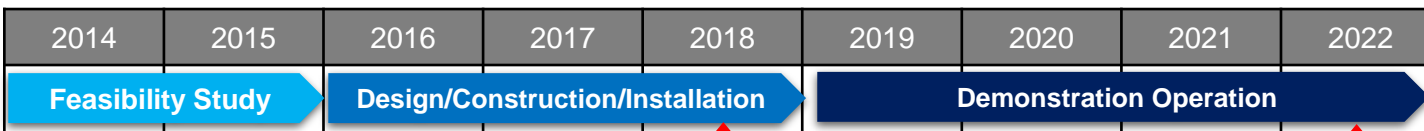
Cosmo Eco Power Co., Ltd.



【Installing site】



Fig.Google

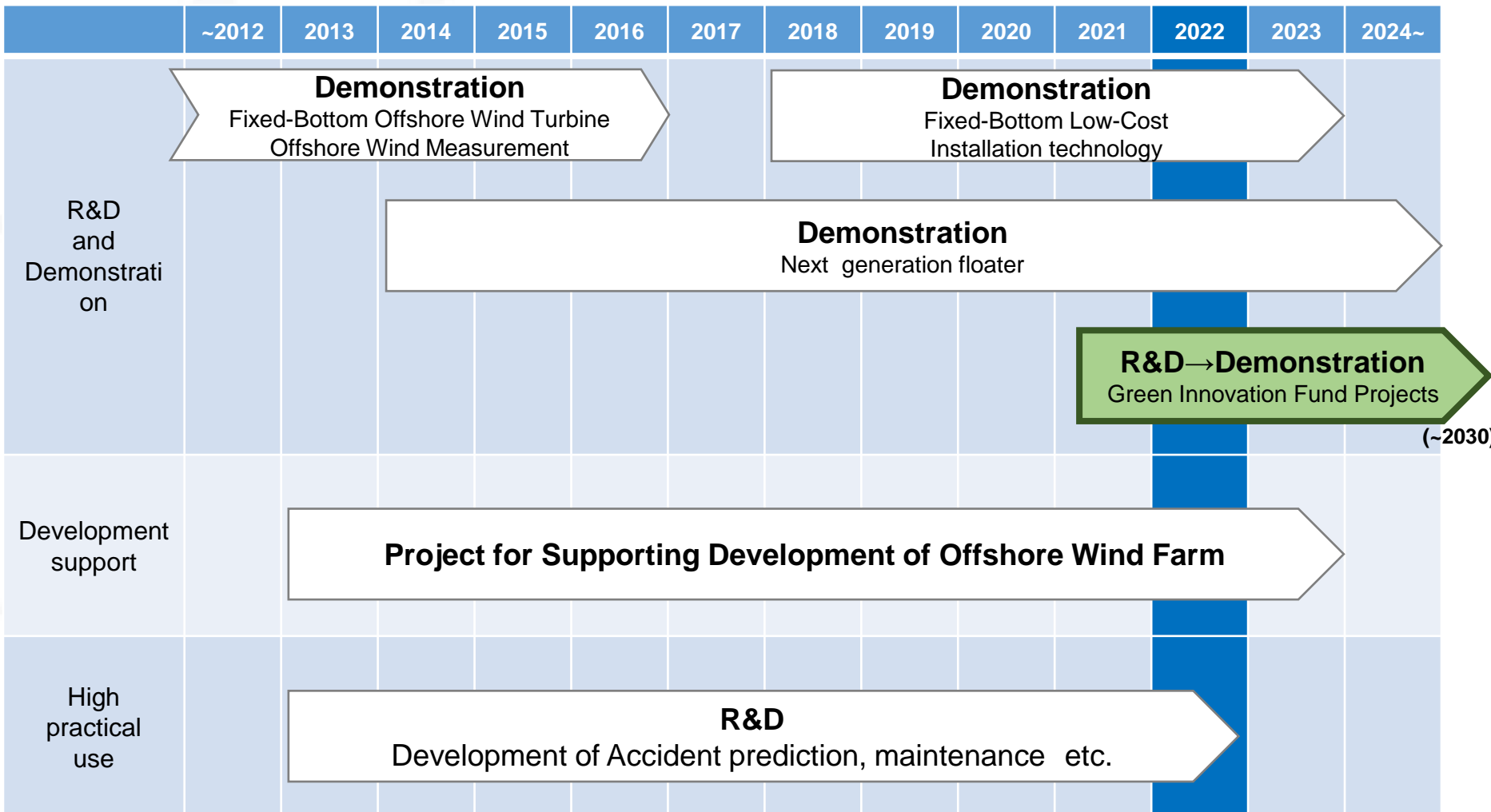


June: Floater manufacturing complete

August: Turbine Assembly complete

September: Installation complete

3-3 NEDO's Offshore Wind Development Projects



3-3 Green Innovation Fund

／Project to Achieve Lower Costs for Offshore Wind Power

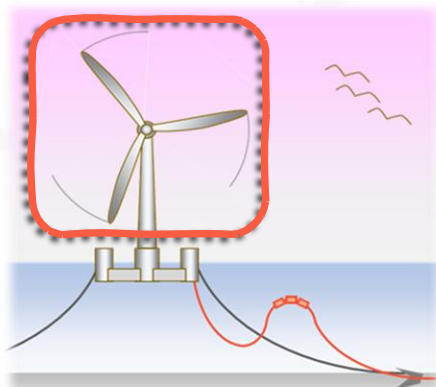


	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
Theme: Phase1-① Project for the development of next-generation wind turbine technology	<ul style="list-style-type: none"> high-quality mass production technology for large wind turbines development of elemental technologies for next-generation wind turbines etc. 					<p>Demonstration Phase integrated design of wind turbine, floating structure, cable, mooring, etc.</p>				
Theme: Phase1-② Development of low-cost technology for manufacturing and installing floating foundations	<ul style="list-style-type: none"> Optimization of wind turbine foundations Mass production of floats Hybrid mooring systems Development of low-cost construction technology etc. 									
Theme: Phase1-③ Development of offshore wind-related electrical system technology	<ul style="list-style-type: none"> High-voltage dynamic cables Floating offshore substations etc. 									
Theme: Phase1-④ Project for upgrading offshore wind power operation and maintenance	<ul style="list-style-type: none"> Development of Operation Maintenance and Repair Technologies Advancement of preventative measures and maintenance using digital technologies Advancement of monitoring and inspection technology etc. 									
Theme: Phase2 Demonstration project for floating offshore wind										
	Phase1 : 34.5 billion yen					Phase2: 85.0 billion yen				

3-3 Green Innovation Fund ／Project to Achieve Lower Costs for Offshore Wind Power

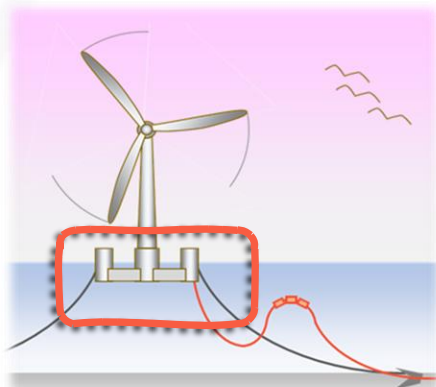


As Phase 1, Elemental technology research and development is being conducted in four areas.



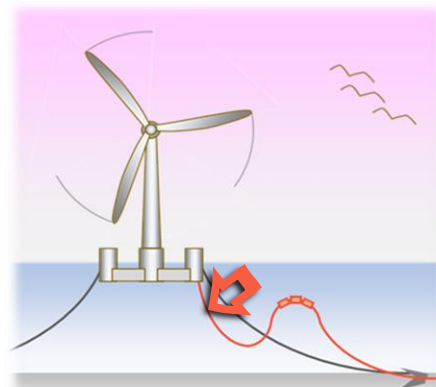
Theme 1-①
Project for the development of next-generation wind turbine technology

Wind turbine manufacturer
Parts manufacturer etc.



Theme 1-②
Development of low-cost technology for manufacturing and installing floating foundations

Energy company
Construction company etc.



Theme 1-③
Development of offshore wind-related electrical system technology

Energy company
Metal manufacturer etc.



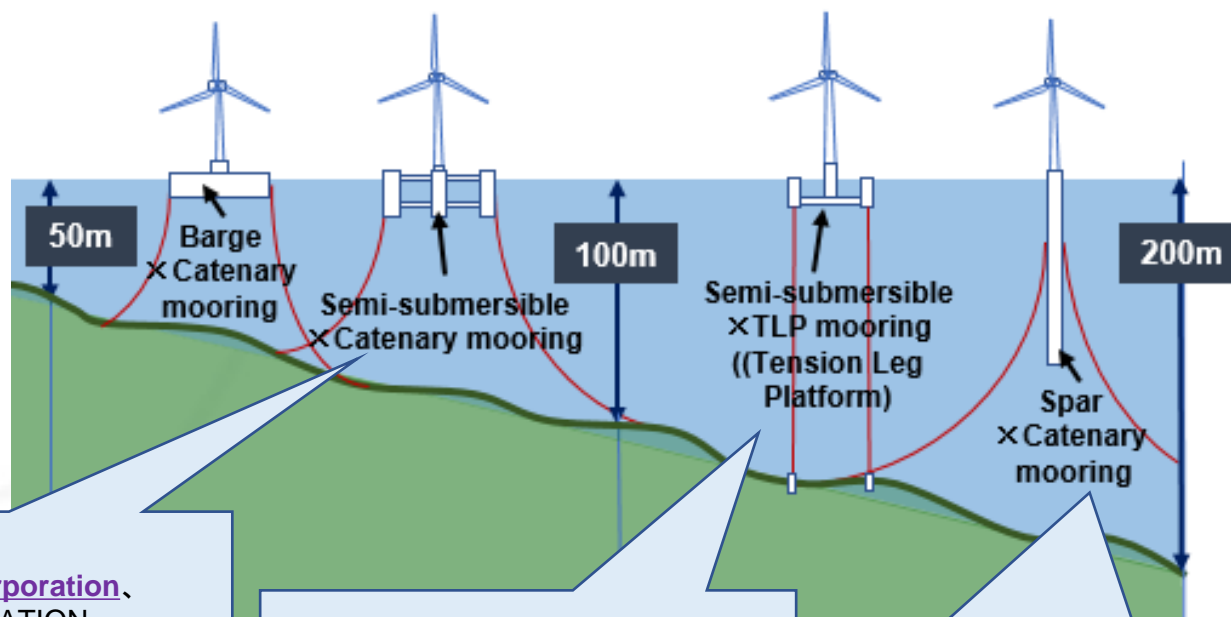
Theme 1-④
Project for upgrading offshore wind power operation and maintenance

Wind turbine maintenance company
Energy company etc.

3-3 Theme 1-②

Development of low-cost technology for manufacturing and installing floating foundations

By leveraging Japan's shipbuilding technologies and infrastructure, such as docks, under this project, technologies will be developed to optimize floating bases and mooring systems. Low-cost construction technologies will also be developed to realize the world's first mass production system for floating turbines.



Project member :

- [Hitachi Zosen Corporation](#)、KAJIMA CORPORATION
- Japan Marine United Corporation, Nihon Shipyard Co., Ltd., "K"Line Wind Service, LTD、TOA CORPORATION
- TOKYO GAS Co., Ltd.

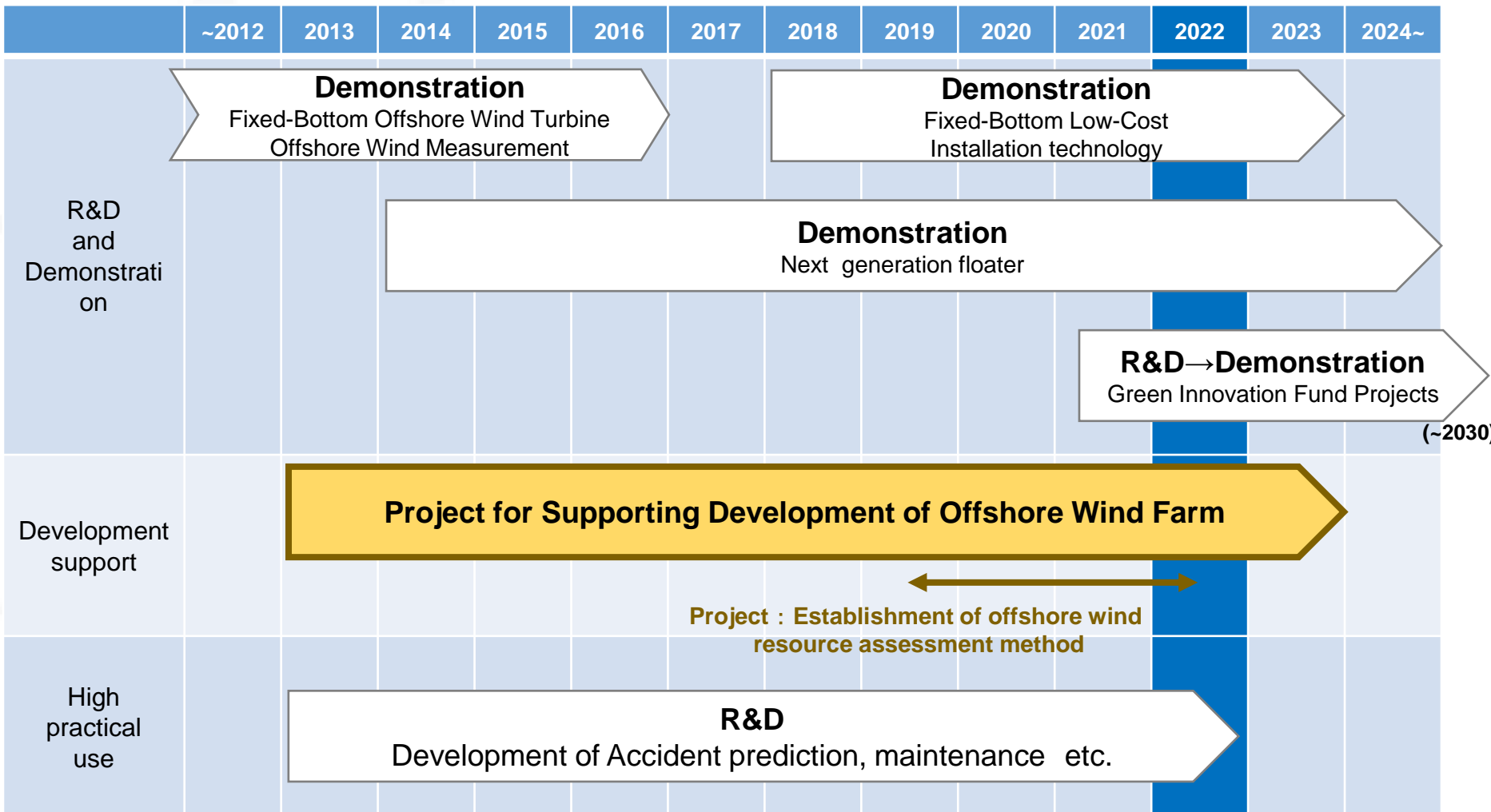
Project member :

- [MODEC, Inc.](#)、TOYO CONSTRUCTION CO.,LTD.、FURUKAWA ELECTRIC CO., LTD.、JERA Co., Inc.

Project member :

- TEPCO Renewable Power, Incorporated, [Tokyo Electric Power Company Holdings, Inc.](#)
- [TODA CORPORATION](#)

3-4 NEDO's Offshore Wind Development Projects



3-4 Project for Supporting Development of Offshore Wind Farm (Establishment of offshore wind resource assessment method)

This project develops technologies to establish a rational observation method for offshore wind conditions in Japan's ocean areas, utilizing remote sensing technology, etc.

【委託先】

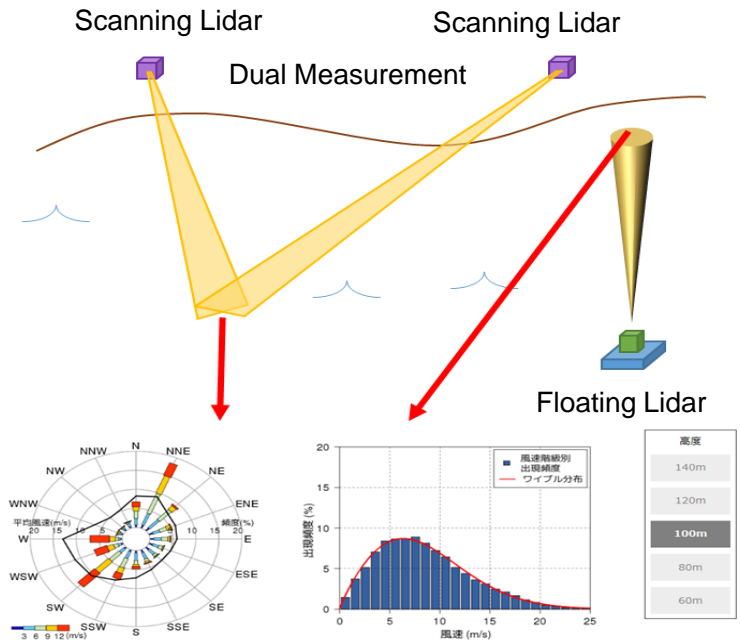
National Institute of Advanced Industrial Science and Technology

Kobe University

NIPPON KAIJI KYOKAI

E&E Solutions Inc.

Japan Meteorological Corporation



Scanning Lidar



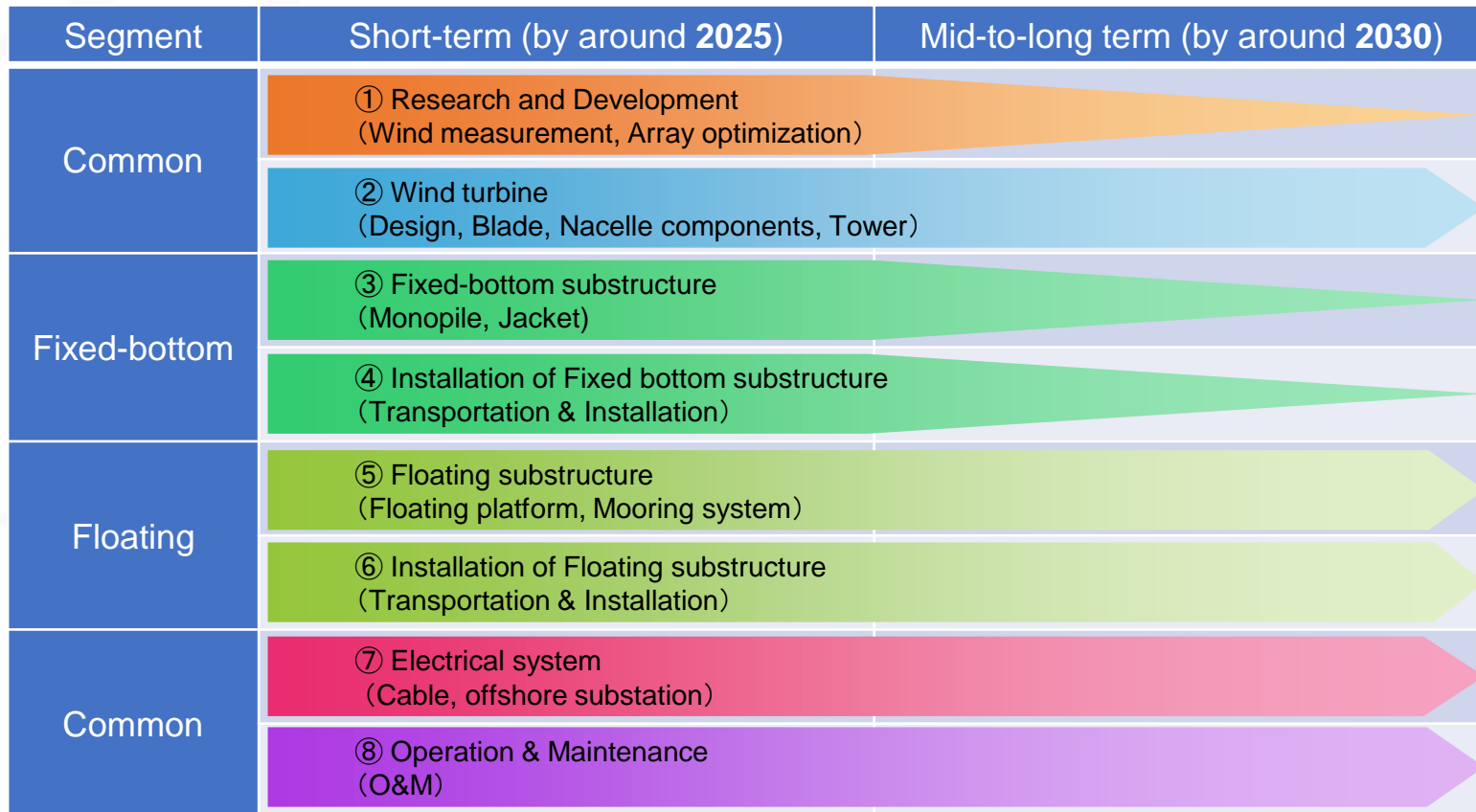
Floating Lidar

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4 Future NEDO projects

~Offshore Wind Power Technology Development Roadmap~

- For technologies of **research and development** and **manufacturing/ installation of fixed-bottom type foundation**, which has relatively matured, make a short-term intensive effort to develop and aim at **early cost reduction**.
- **Accelerate development of elemental technologies** for **wind turbines which is essential to build a supply chain, floating type wind power generation for which mid-to-long term expansion is expected** and so on, although the maturity level of those technologies is relatively low.





国立研究開発法人 新エネルギー・産業技術総合開発機構

New Energy and Industrial Technology Development Organization

**Thank you so much for your kind attention.
Merci de votre attention.**