

Eleven Proposals for Co-Creating the Future of Offshore Wind and the Fishing Industry

April 2025

Mitsubishi Research Institute

About the author

Mitsubishi Research Institute

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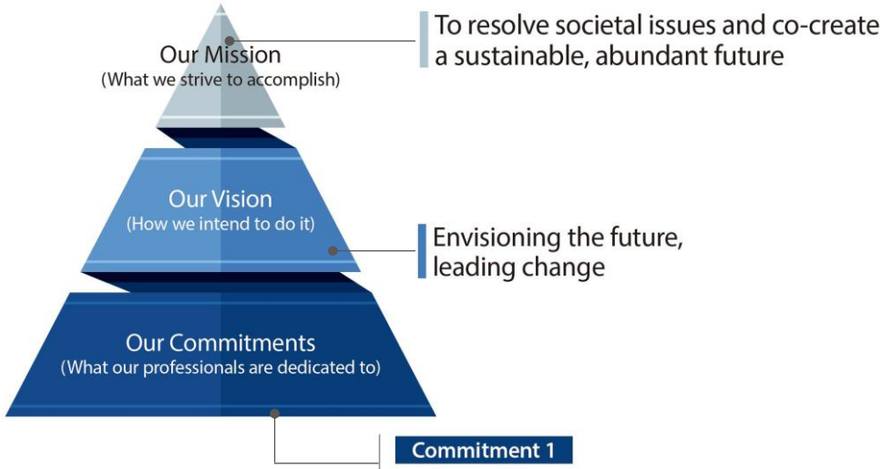
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Commitment 2
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Commitment 3
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List of terms and abbreviations

Term	Meaning
AUV	Abbreviation for autonomous underwater vehicle; an autonomous underwater robot that acts fully automatically without human intervention
BACI	Abbreviation for Before-After-Control-Impact; a research method in which an impacted area affected by development and an unaffected control area are set up, and the impact before and after development in both areas is compared
BAG	Abbreviation for Before-After-Gradient; a research method to compare the impact before and after development by distance from the development location
Biologging	A method of acquiring data by attaching a sensor-equipped data logger (data storage device) to a fish and then directly retrieving the device
Biotelemetry	A method for determining a fish’ s location by attaching a device to the fish that emits radio or sound waves and detecting those signals with a receiver
Blue Carbon Credit	Carbon credits certified for the carbon absorbed by marine organisms such as seaweed and algae
EEZ	Abbreviation for Exclusive Economic Zone. It denotes the sea areas outside territorial waters that do not extend beyond 200 nautical miles from the baselines of the territorial sea.
Environmental DNA	Genetic information of organisms in the environment
Fisheries Eco-Label Certification	A system that certifies fisheries and aquaculture operations that give due consideration to the sustainable use of marine resources and the environment
Fisheries Liaison	An organization that specializes in coordinating with fishermen on offshore wind power
Fish reef effect	The effect of installing structures in the sea that attract fish to the structures or provide a place for fish to spawn or grow
Marine spatial planning	The process of defining the areas of activity of various stakeholders in the maritime space through policy decision-making
ROV	Abbreviation for remotely operated vehicle; a type of underwater robot that is a remotely controlled unmanned vehicle operated by a human via cable
Satoumi	Coastal waters where biological productivity and diversity have increased due to moderate human intervention
Seepage effect	Effects on fishery catches as fish grown in protected fish reef and sanctuaries are released into the fishing grounds
Smart fisheries	Next-generation fishing industry that realizes both sustainable utilization of fishery resources and sustainable growth of the fishing industry through the use of ICT, IoT, and other advanced technologies
Umigyo	Businesses that are expected to generate vitality, income, and employment in regional areas by utilizing the value and attractiveness of local resources of the ocean and fishing villages

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1. Objective and summary of this report

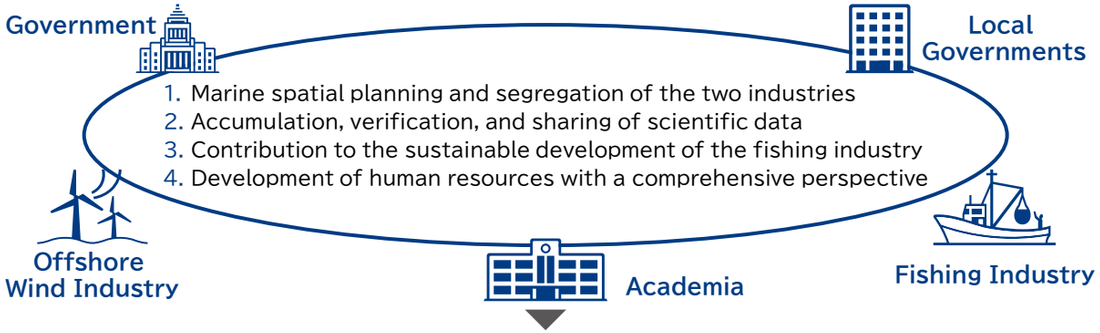
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1. Objective and summary of this report

Organizing eleven key issues and proposals for co-creating the future of offshore wind and the fishing industry

- Offshore wind power is an important source of electricity for achieving net-zero greenhouse gas emissions by 2050, ensuring energy and economic security, and fostering industrial and economic growth.
- In order to realize the large-scale introduction of offshore wind power in Japan, it will be extremely important to achieve coexistence with the fishing industry, a major industry that uses the ocean.
- The key to success will be to **promote dialogue toward the co-creation of a future for offshore wind and the fishing industry, and to seek optimal solutions for the use of the ocean based on mutual respect and common understanding between the two sectors.**
- This report -- **intended for those who are considering how to achieve coexistence between offshore wind and the fishing industry and whether coexistence is even possible -- outlines the roles that the national government, local governments, the offshore wind industry, parties involved in the fishing industry, and academia should each play, the key issues that need to be discussed, and proposals for addressing those issues.**
- We hope that this report will serve as a starting point for discussion and dialogue among all relevant parties and will contribute to achieving coexistence between offshore wind and the fishing industry.

Summary: Key Factors for the Future Co-Creation of Offshore Wind and the Fishing Industry



Reference: Key Measures for the Development of Japan's Offshore Wind Market and Industry

Increasing the value of investments in the Japanese market	● Set ambitious implementation goals ● Establish a predictable market by identifying ocean areas for development ● Expand the scale of projects	Scope of this report Realizing symbiosis between offshore wind and the fishing industry	● Foster mutual understanding between the offshore wind industry and the fishing industry ● Share knowledge and data from both industries (e.g., data on promising ocean areas and actual fishery conditions) ● Study measures for coexistence with the fishing industry through collaboration between the two industries
Developing a system for EEZ deployment	● Prepare the relevant laws, regulations, and institutions related to EEZ development ● Identify stakeholders and develop a consensus-building process	Expanding introduction of floating offshore wind power	● Establish specific targets for introduction of floating offshore wind ● Establish large commercial projects early ● Maintain a FIT system that makes it possible to ensure business viability
Strategic Industrial Policy	● Support the formation of supply chains linked to commercial projects ● Operate FIT/FIP schemes linked to industrial policy ● Provide incentives for businesses to develop domestic industry	Thoroughly rationalizing the licensing system	● Establish a certification and licensing system consistent with the global market ● Improve the system so as to shorten the time required for licensing procedures and to reduce business risks
Upgrading the bidding system	● Early adoption of the Japanese version of the Centralized Method and extension to EEZ ● Ensure predictability of FIT/FIP schemes	Planned development of port and grid infrastructure	● Steadily implement the Grid Master Plan ● Draw up port and grid infrastructure development plans consistent with promising offshore wind areas
Promoting human resource development	● Develop a roadmap for human resource development ● Support specialized training facilities and educational programs ● Disseminate information and raise awareness of offshore wind power	Decarbonizing the supply chain and promoting a circular economy	● Low-carbon supply chain through technological innovation in production and construction processes ● Establish recycling technology for blades, etc.

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2. Issues and challenges of Japan's fishing industry

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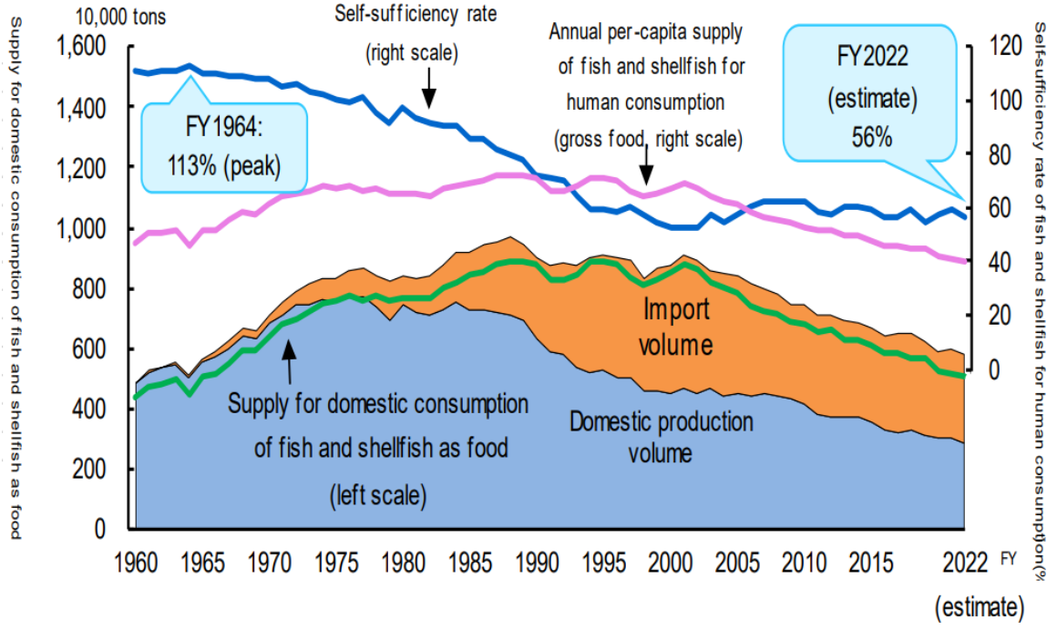
2. Issues and challenges of Japan's fishing industry

To protect the future of the fishing industry, new initiatives to achieve its sustainable development are required

Various issues surrounding fisheries and the fishing industry have become apparent, and the medium- to long-term sustainability of fisheries and the fishing industry is being questioned.

- The fishing industry as a whole, including fisheries, is facing challenges such as declining domestic consumption of fish and shellfish, declining production due to a decrease in fishing resources and a decrease in the number of fishermen, stagnant self-sufficiency in fish and shellfish, changes in fishing grounds due to climate change, and deteriorating fishing industry management, and the very nature of sustainable fisheries and a sustainable fishing industry is being questioned.

Trends in domestic production, consumption, and self-sufficiency of fish and shellfish



Source: Fisheries Agency, FY2023 White Paper on Fisheries Summary, p. 14, June 2024

Toward the sustainable development of fisheries and the fishing industry, a variety of challenges must be faced from the perspectives of fisheries resources, human resources, climate change, and fisheries management.

- In order to achieve sustainable development of fisheries and the fishing industry, it is necessary to restore production through the promotion of resource management and training of fisheries leaders, to respond to changes in fishing grounds, to improve fisheries management by increasing fish prices, to promote fishing villages, and to adapt to consumer needs.

Fishery and fishing industry issues and examples of response measures

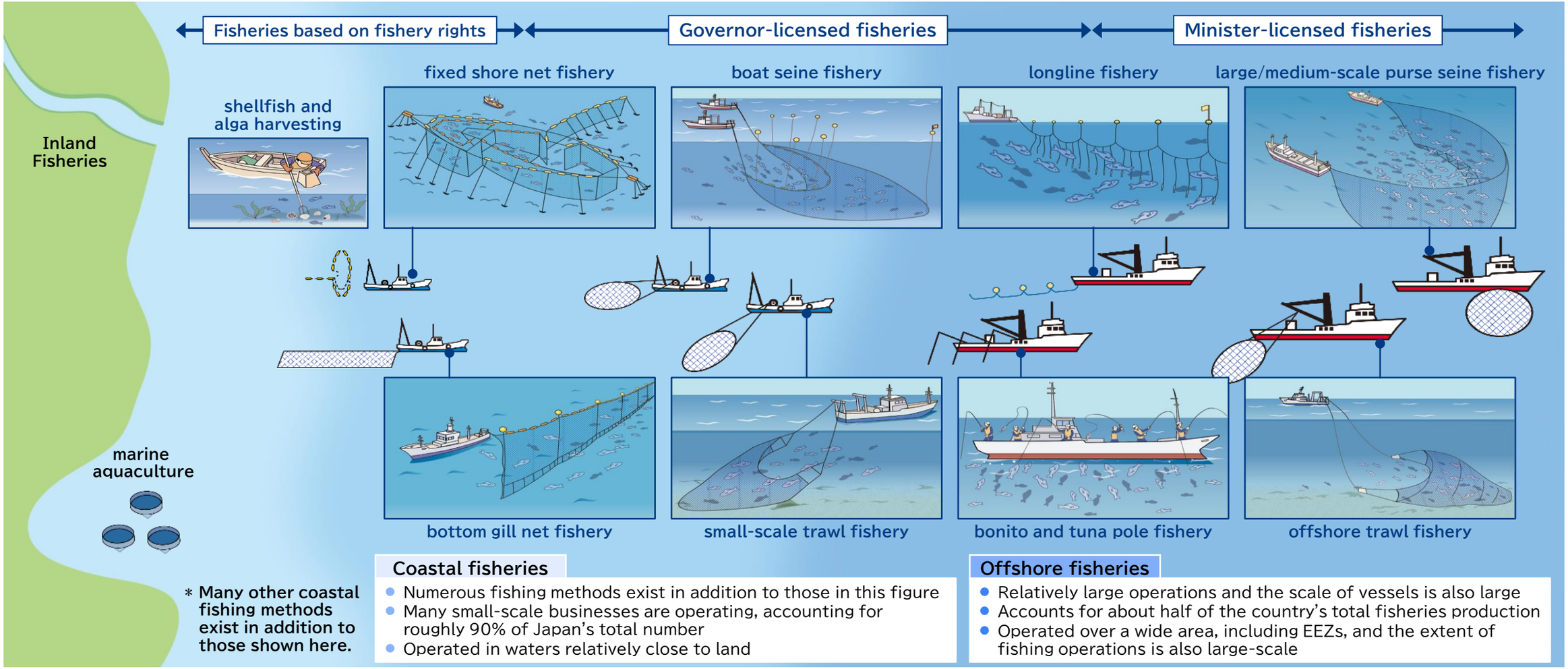
Fishery and Fishing Industry Issues		Examples of response measures for sustainable fisheries and fishing industry
Decrease in fishery production	Decrease in fish stocks	● Promoting sustainable resource management ● Promoting hatchling production/release and aquaculture
	Decrease and aging of fishery workers	● Fostering leaders in the fishing industry ● Improving the fishing work environment
	Inefficient fishing activities	● Renewing fishing boat equipment
Changes in fishing grounds due to climate change	Changes in sea water temperature	● Selecting sea areas for operation using sea temperature data and ICT technology ● Developing new aquaculture target species
	Changes in marine ecosystems	● Improving the fishing environment, including preservation of seaweed beds and tidal flats
	Changes in target species of fish caught	● Modifying fishing methods to accommodate new fish species
Deterioration of fishery management	Slump in fish prices	● Strategically developing and branding processed products ● Expanding of marine product exports
	Soaring fuel and other costs	● Reducing fuel oil consumption through alternative power sources ● Providing support to counter rising fuel costs
	Increased maintenance costs	● Encouraging upgrading to the latest equipment
Decline of fishing villages	Declining and aging population in villages supporting the industry	● Improving regional incomes and securing employment opportunities through the maritime industry
Decrease in consumption	Changes in consumer preferences due to shift toward food convenience, etc.	● Providing seafood that is easy to prepare ● Promoting, and educating the public about, fish cuisine

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2. Issues and challenges of Japan's fishing industry

Japan's seas, from coastal to offshore, are home to a wide variety of fisheries supporting the country's rich fishing industry

A wide variety of fisheries are operated in the seas of Japan. Furthermore, coastal and offshore fishing operations differ in scope and scale of operations and in the authorities that grant fishing licenses. Understanding the diversity and characteristics of Japan's fisheries is also a key point when considering the coexistence of offshore wind and the fishing industry.



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3. Eleven proposals for co-creating the future of offshore wind and the fishing industry

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3. Eleven proposals for co-creating the future of offshore wind and the fishing industry

List of 11 proposals for co-creating the future of offshore wind and the fishing industry

G :Central Government L :Local Governments W :Offshore Wind Industry F :Fishing Industry A : Academia

coastal :Target sea area for coastal fisheries offshore :Target sea area for offshore fisheries Whole ocean :Whole target sea area

1. Marine spatial planning and segregation of the two industries		EXECUTING PARTIES	MAIN TARGET SEA AREA
1	In order to co-create the future of offshore wind and the fishing industry, the government must take the lead in promoting a policy decision-making process that appropriately categorizes the spheres of activity of the stakeholders who use the ocean.	G L W F A	Whole ocean
2	The highest priority symbiotic measure is to select and segregate ocean areas that are not deemed to pose obvious obstacles to the fishing industry. As a gateway to this dialogue, the government should take the initiative in sharing with fishermen and the public information on ocean areas necessary for offshore wind power.	G W	offshore
3	In order to clarify the areas where the fishing industry would obviously be hindered, the national government should take the lead in consolidating and sharing fishery operation data as transparently as possible, with the cooperation of local governments, fishing industry-related organizations, and research institutes.	G L F A	offshore
4	The national government and the offshore wind industry should work together and exchange views with fishermen to develop rules and technical measures necessary to ensure safety of operations during passage through, and fishing operations in, wind farms and their neighboring waters.	G W F	coastal

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2. Accumulation, verification, and sharing of scientific data		EXECUTING PARTIES	MAIN TARGET SEA AREA
5	In order to provide information to support fishermen's decision-making, industry, government, and academia must work together to verify, using scientific data, both the negative and positive impacts of offshore wind power on the fishing industry and provide honest explanations of those impacts to those involved in the fishing industry.	G W A	Whole ocean
6	To verify the impacts on the fishing industry based on scientific data, industry, government and academia must work together to establish effective methods for investigating the impacts on the fishing industry. In addition, collaborative efforts should be made to accumulate and share wide-area data.	G W A	offshore
7	It is important for those involved in offshore wind to listen sincerely to the opinions of fishermen, to work together with them to consider and implement measures to coexist with fisheries that will truly lead to the development of the fishing industry, and to accumulate best practices.	G L W F A	Whole ocean
8	It would be effective to work with fishing industry experts and fishermen to develop collection methods for data, such as sea water temperature, using offshore wind farms as data collection platforms that will lead to the operational improvement of fisheries and then deploy them throughout the industry.	G W F A	Whole ocean

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3. Contribution to the sustainable development of the fishing industry		EXECUTING PARTIES	MAIN TARGET SEA AREA
9	The offshore wind industry, fishermen, and local stakeholders should work together to generate new business models that will revitalize the fishing industry and fishing communities, and establish a system that will enrich the entire region involved in the fishing industry.	G L W F A	coastal
10	In offshore fisheries, where the range of operations is extensive, the national government should take the lead in discussing new mechanisms to gain understanding from offshore fishermen, such as the use of a broad-based fund in the event of unforeseen adverse impacts.	G W F A	offshore

4. Development of human resources with a comprehensive perspective		EXECUTING PARTIES	MAIN TARGET SEA AREA
11	It is essential that industry, government, and academia work together to develop people who can make comprehensive judgments about offshore wind power, the fishing industry, and other uses of the ocean, and consider how to use the ocean for the benefit of the region.	G L W F A	coastal

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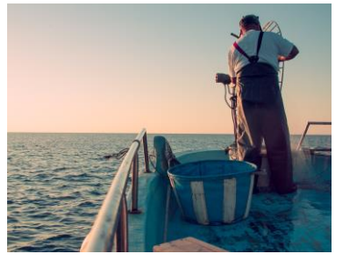
3. Eleven proposals for co-creating the future of offshore wind and the fishing industry

It is time for all parties to cooperate and start future-oriented discussions to co-create the future of offshore wind and the fishing industry

EXECUTING PARTIES: G L W F A MAIN TARGET SEA AREA: Whole ocean

❶ In order to co-create the future of offshore wind and the fishing industry, the government must take the lead in promoting a policy decision-making process that appropriately categorizes the spheres of activity of the stakeholders who use the ocean.

- How should Japan's abundant marine space and resources be utilized in order to leave a safe, secure, and sustainable society to future generations? How can we introduce offshore wind power, which is essential for the fight against climate change and for Japan's energy policy, while protecting fisheries from the perspective of food policy and also taking into account defense, maritime transport, environmental conservation, etc.?
- In order to answer these questions, all entities in industries and sectors that use the ocean must work together to **consider what to protect, what to share, and how to develop together in a future-oriented manner**.
- This is the policy decision-making process of appropriately sorting out the spheres of activity of stakeholders who use the ocean in line with the goals and values of the nation and society, i.e., **the process of formulating a marine spatial plan** itself, which is an unavoidable and **critical measure for the future of Japan that should be led and realized by the national government**.
- In order to realize this process, **all parties interested in co-creating the future of offshore wind and the fishing industry, including local governments, the offshore wind industry, research institutes, and fisheries-related organizations, must join forces to support the government's activities.** It will take constant effort to overcome the stove-piped divisions between relevant government ministries and agencies, share the information each party has, pool their wisdom, engage in dialogue, and make steady progress to find the best possible solutions.








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3. Eleven proposals for co-creating the future of offshore wind and the fishing industry

Sharing information on offshore wind needs and fishing operations is the first step in starting a dialogue between the two industries

EXECUTING PARTIES: G W　　MAIN TARGET SEA AREA: offshore

❷ The highest priority symbiotic measure is to select and segregate ocean areas that are not deemed to pose obvious obstacles to the fishing industry. As a gateway to this dialogue, the government should take the initiative in sharing with fishermen and the public information on ocean areas necessary for offshore wind power.

- It is inevitable that offshore wind power will physically restrict fishing activities, and in particular, it is difficult to balance offshore wind power with offshore fisheries, which develop fishing activities over a wide area and on a large scale. Therefore, **the highest priority coexistence measure, particularly offshore, is to select and separate ocean areas where it is not deemed that there will be any obvious hindrance to fishing**.
- In order to separate such offshore areas from the areas where fishery operations are obviously hindered, **a dialogue with fishery stakeholders, including the sharing of information on fishery operations**, will be necessary. The first step in promoting this dialogue is for the **government to take the initiative in presenting fishermen with specific information on the ocean areas necessary for the introduction of offshore wind power**.
- Working fishermen are unable to make decisions when asked to approve or disapprove of individual offshore wind projects without an overall picture of how much offshore wind development will be required in which ocean areas in the future. **Providing specific information on offshore areas is the first step toward alleviating the concerns of fishermen in the field and promoting understanding and dialogue**.
- In order to specify information on ocean areas, **the government should clarify medium- and long-term introduction targets**, and the government and the offshore wind industry should work together to **map out potential ocean areas and specify the necessary area,** taking into account natural, technological, and social conditions. This is an important initiative from the perspective of the **entire nation in considering how the ocean should be utilized**.

EXECUTING PARTIES: G L F A　　MAIN TARGET SEA AREA: offshore

❸ In order to clarify the areas where the fishing industry would obviously be hindered, the national government should take the lead in consolidating and sharing fishery operation data as transparently as possible, with the cooperation of local governments, fishing industry-related organizations, and research institutes.

- Fishing industry officials will be asked to **organize the areas where obvious hindrances to fisheries occur**, taking into consideration the actual conditions of operations in each area, the characteristics of fishing grounds by fishing method, and the spawning and growth environment of the target fish species.
- In the process of selecting ocean areas where obvious obstacles to fisheries occur, it is necessary to organize **data on past and present fishing operations throughout the country,** while giving consideration to the confidentiality of fishing ground information. It is also important to organize **information on fish spawning and growing areas** in order to conserve fishery resources.
- The **Fisheries Agency should take the lead in organizing these data**, and with the cooperation of local governments, national and regional fisheries-related organizations, and research institutes, it is essential that efforts be made to **centralize and consolidate the information held by each organization, including location of operations, fish species, catches, spawning and rearing locations, and other data**.
- Compiling fishing operation data will also contribute to realizing the sustainable use of fishery resources through the smart fisheries industry promoted by the Fisheries Agency. The Fisheries Agency should work to foster understanding and promote cooperation among fishermen, organize fishing operation data, and **share the data as transparently as possible**.

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3. Eleven proposals for co-creating the future of offshore wind and the fishing industry

Let's formulate rules for navigation and fishing operations in and near wind farms, and advance technical measures to ensure safety

EXECUTING PARTIES: G W F　　MAIN TARGET SEA AREA: coastal

❹ The national government and the offshore wind industry should work together and exchange views with fishermen to develop rules and technical measures necessary to ensure safety of operations during passage through, and fishing operations in, wind farms and their neighboring waters.

- There will be restrictions in the passage of fishing vessels through, and fishing operations in and near, wind farms in order to protect power generation facilities and to ensure the safety of working vessels.
- On the other hand, fishermen have expressed a desire to pass through wind farms safely and to operate in their surrounding waters if fish are living in or migrating to them. **Depending on the fishing method, fishing operations may be possible within wind farms, especially along the coast**.
- Currently*, no clear rules have been established for passage through, or operation in, wind farms and their surrounding waters. It would be effective for the government and the offshore wind industry to work together to **formulate guidelines and other rules regarding the transit and operation of fishing vessels in wind farms and surrounding waters, with safety as the first priority**.
- The offshore wind industry should also **verify the feasibility of fishing operations within wind farms** by conducting test operations in actual wind farms.
- In doing so, it is necessary to clearly state the weather conditions under which operations will be suspended, and to **adopt technical measures**, such as installing warning devices that use sound or light etc. to warn approaching vessels, in order **to prevent accidents** such as collisions when visibility is poor.
- At the same time, it is necessary to consider the **provision of insurance to compensate for losses on the part of fishermen** in case of collisions between wind turbines and fishing vessels, damage to fishing gear, or damage to cables.

* In the case of EEZs, it is assumed that a safe water zone will be established under the Act on Establishment of Safety Zone Pertaining to Structures at Sea to ensure the safety of offshore structures etc. and the safety of ship navigation in the sea areas surrounding such offshore structures when necessary.





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3. Eleven proposals for co-creating the future of offshore wind and the fishing industry

Need for verification based on scientific data and honest explanations regarding the negative and positive impacts of offshore wind on fisheries

EXECUTING PARTIES: G W A　　MAIN TARGET SEA AREA: Whole ocean

❺ In order to provide information to support fishermen's decision-making, industry, government, and academia must work together to verify, using scientific data, both the negative and positive impacts of offshore wind power on the fishing industry and provide honest explanations of those impacts to those involved in the fishing industry.

- Fishing industry stakeholders, who are responsible for the future of the fishing industry and are being asked to make decisions on whether to accept offshore wind power, are seeking information on the **negative and positive effects that will result from offshore wind power development**.
- On the other hand, the accumulation of scientific data on these impacts is not sufficient, and the situation is such that data and information that can reassure and convince fishermen have not been provided.
- In order to eliminate the concerns of fishing industry stakeholders and gain their understanding, **it is important to quantitatively evaluate and share with them as much as possible** the impacts to fisheries and various effects (fish reef effects, seepage effects, protection and recovery effects of fishery resources, etc.) of the siting of offshore wind power in both coastal and offshore areas.
- In order to conduct quantitative assessments, **fishery impact studies should be continued over time to accumulate scientific data**. The accumulated data **should be shared throughout the industry and fed back into future development projects**.
- To this end, it is desirable to implement a unified methodology to the extent possible so that the results of fishery impact studies can be compared among wind farms according to fishing methods and fish species. In addition, a **mechanism* for data sharing and networking among wind farms and regional research institutions** should be established through collaboration among the national government, the offshore wind industry, and academia.

* An extensive network exists along the U.S. Pacific coast and in the Caribbean Sea, where collaboration among researchers using biotelemetry technology can detect transmitter signals and share data on a coast-wide and continental scale.

EXECUTING PARTIES: G W A　　MAIN TARGET SEA AREA: offshore

❻ To verify the impacts on the fishing industry based on scientific data, industry, government and academia must work together to establish effective methods for investigating the impacts on the fishing industry. In addition, collaborative efforts should be made to accumulate and share wide-area data.

- Especially in offshore areas, including EEZs, it is difficult to evaluate the impacts of offshore wind power on fisheries in isolation because of the wide movement range of target fish and the broad range of fishing operations, as well as the impacts of climate change. Therefore, **it is necessary to further deepen the study of fishery impact investigation methods assuming offshore locations.**
- As for specific investigation methods, in addition to conventional BACI/BAG, statistical surveys, and catch surveys, **monitoring that combines environmental DNA etc. with biologging, biotelemetry, and fish detection** are thought to be effective.
- **It is necessary to establish a feasible and reasonable monitoring methods** by effectively narrowing down the fish species to be monitored and verifying the specific monitoring methods and period of implementation in actual wind farms.
- It is difficult for individual operators to come up with effective fishery impact investigation methods, including monitoring. Therefore, with the **government taking the lead and providing support, the offshore wind industry and academia must work together to find solutions** in this collaborative domain.

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3. Eleven proposals for co-creating the future of offshore wind and the fishing industry

By drawing close to the fishing industry, we must devise and implement symbiotic measures that truly lead to its flourishing

EXECUTING PARTIES: G L W F A MAIN TARGET SEA AREA: Whole ocean

❼ It is important for those involved in offshore wind to listen sincerely to the opinions of fishermen, to work together with them to consider and implement measures to coexist with fisheries that will truly lead to the development of the fishing industry, and to accumulate best practices.

- For fishermen to embrace offshore wind, it is crucial that they can determine that offshore wind development will be a positive for the future of the fishing industry.
- What that positive value is will be determined based on the challenges facing the fishing industry and the future vision for solving those challenges. In addition, the fishing industry's challenges, by region and whether coastal or offshore, are extremely varied and wide-ranging, and there ought to be many diverse measures for coexisting with fisheries.
- Therefore, **the offshore wind industry must gain a deeper understanding of the issues facing the fishing industry, listen sincerely to the opinions of fishermen, and consider together with fishermen what would be truly effective measures for coexistence with fisheries**.
- It is also important for the offshore wind industry to **actually test the fishery coexistence measures devised with fishermen at wind farms, verify their effectiveness, and disseminate the results widely as best practices**. The accumulation of best practices one by one will lead to the enhancement of social acceptance of offshore wind power.
- **The government should provide solid financial support for such efforts**. In addition, **cooperation from local governments and academic circles**, who have a good understanding of the region's and the fishing industry's conditions and have established networks, is also indispensable when considering measures for coexistence with fisheries.

Examples of fishery coexistence measures that address fishery challenges

＊includes measures the effectiveness of which needs to be verified in the future

Fishery Challenges	Examples of measures expected to be effective for coexistence with fisheries		Target area
Improving catches and responding to changes in fishing grounds	Predicting fishing grounds by fish ecological surveys	Through fisheries impact studies, etc., acquire fish behavior data using technologies such as biologging and biotelemetry, etc., and use the data to predict fishing grounds, etc.	whole ocean
	Providing information on fish species	Share marine data collected through environmental impact surveys, fishery impact surveys, and offshore wind power generation; provide fishing ground predictions through AI analysis and information on new fish species based on changes in seawater temperature etc.	whole ocean
	Creating fish habitats by building fish reefs and seaweed beds	Create a new environment for fish growth by building fish reefs and seaweed beds using offshore wind power foundations	whole ocean
	Sharing oceanographic data	Share oceanographic data collected by offshore wind power for use in environmental monitoring, etc.	whole ocean
	Developing new fishing methods	Develop new and efficient fishing methods in collaboration with fishermen in response to changes in areas of operation	whole ocean
Stabilizing business operations	Reducing fuel costs and decarbonizing	Supply offshore wind-generated electricity to fuel-cell vessels and other vessels, helping to reduce fuel costs and decarbonize fishing vessels	whole ocean
	Promoting seafood sales through branding	Brand marine products using electricity generated by offshore wind power, expand sales channels and enhance marketing	whole ocean
	Supporting fishing industry development by using finance funds	Carry out activities to promote fisheries and local communities using a fund consisting of a portion of income from power generation projects	whole ocean
	Creating Blue Carbon Credits	Sell CO2 absorption from seaweed bed creation as J Blue Credits	coastal
	Turning offshore wind power and fishing experiences into tourism and educational resources	Contribute to an increase in the number of visitors by providing content that combines offshore wind farm tours with fishing experiences	coastal
	Providing employment opportunities by utilizing fishing vessels	Generate new revenue by outsourcing visual inspections using fishing boats and patrol boat operations etc.	coastal
Improving the working environment of the fishing industry	Providing a communication environment at sea	Contribute to the improvement of the telecommunication environment in sea areas where internet connection is difficult by utilizing offshore wind power	whole ocean
	Conducting surveillance of suspicious vessels and poachers	Detect suspicious ships and illegal fishing boats via a surveillance system using long-distance cameras installed at offshore wind farms	whole ocean
Emergency response	Providing emergency power supply	Supply offshore wind-generated power to fishing facilities and communities during emergencies	whole ocean

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3. Eleven proposals for co-creating the future of offshore wind and the fishing industry

Let's take on the challenge of using offshore wind farms as a data platform to expand the potential of the fishing industry

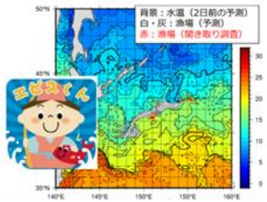
EXECUTING PARTIES: G W F A　　MAIN TARGET SEA AREA: Whole ocean

⑧ It would be effective to work with fishing industry experts and fishermen to develop collection methods for data, such as sea water temperature, using offshore wind farms as data collection platforms that will lead to the operational improvement of fisheries and then deploy them throughout the industry.

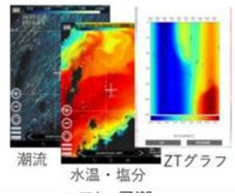
- Because fish move in response to changes in water temperature, from the perspective of improving operational efficiency, fishermen also refer to data such as offshore seawater temperatures while fishing.
- Therefore, if **offshore wind farms could be used as data platforms** to routinely acquire data on seawater temperatures and other parameters, it would be possible to understand changes in fishing grounds and ecosystems caused by fluctuations in water temperature, thereby contributing to improved operational efficiency.
- It would be effective for the offshore wind industry to take the lead **in working with research institutes and fishermen to consider data items and collection methods that will lead to the promotion of fisheries, such as by improving the efficiency of fishing operations**.
- For example, sensors to measure water temperature, current velocity, etc. and underwater cameras could be installed on floating foundations and submarine cables for constant measurement, or similar equipment could be installed on work vessels and ROVs / AUVs to acquire data during maintenance.
- Furthermore, the value of the data will be enhanced by sharing the collected data among wind farms and using it over a wide area. It would be effective for the offshore wind industry to **expand its efforts to include standardization of data items and collection methods as an area of cooperation**.
- These data are **valuable** not only for fisheries promotion, but also **for understanding the current status of and changes in the oceans, including climate change and biodiversity. The government should actively support this** initiative as an asset for the entire nation.

Examples of devices to acquire data

FISH & OCEAN CONDITIONS INFORMATION SERVICE
Improve efficiency of finding fishing grounds via data on projected fishing grounds and ocean conditions (currents/ocean temp. etc.)



JAFIC Ebisu-kun



IDEA Consultants Yochō

DATA SHARING / DIGITAL OPERATION LOG
Share/log data on a tablet in real time from fish finders, tide gauges, boat cameras, etc.



Lighthouse ISANA

OCEAN MEASUREMENT DEVICES (ICT BUOYS etc.)
Use ocean environmental data (sea water temp/salinity, current speed/direction, etc.)

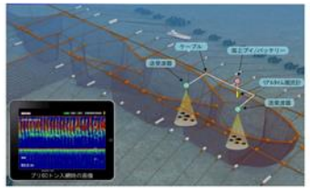


ISE Umilog



JFE Advantech SmartCTD

HIGH-PERFORMANCE FISH FINDERS (REMOTE-TYPE ETC.) Learn at a distance the catch status in fixed shore net fisheries



NITTO SEIMO UBIQUITOUS Fish Finder

UNDERWATER DRONES, FISH NET WASHERS
Remotely inspect nets, retrieve dead fish, remove adhering substances



Space One underwater drone



YANMAR Sensui-kun

Source: Fisheries Agency, On the Dissemination of Smart Fisheries, Business Overview (as of February 8, 2024), https://www.jfa.maff.go.jp/j/kenkyu/smart/attach/pdf/smartfukyu-10.pdf, p.8 (partially modified by Mitsubishi Research Institute, Inc.)

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3. Eleven proposals for co-creating the future of offshore wind and the fishing industry

Let's support fisheries, fishing villages, and the fishing industry through the creation of new business models and initiatives to generate new revenue

EXECUTING PARTIES: G L W F A MAIN TARGET SEA AREA: coastal

⑨ The offshore wind industry, fishermen, and local stakeholders should work together to generate new business models that will revitalize the fishing industry and fishing communities, and establish a system that will enrich the entire region involved in the fishing industry.

- To make fishing an attractive industry, it is necessary to make effective use of fishing resources and expand aquaculture in order to increase the amount of marine products distributed, to expand and streamline distribution networks, and to raise fish prices through branding.
- The offshore wind industry, which makes use of local resources, should actively contribute to these efforts. It is expected that **power generation companies will communicate with fishermen, processors, and distributors, and that power generation companies will share their know-how and resources to jointly create new business models for the fishing industry**.
- For example, possible measures might include increasing fish prices by **branding local fish species and fishing grounds**, enhancing the image of the local fisheries and fishing industry by obtaining eco-label certification of fisheries, **developing new distribution and sales networks for landed fish**, and **expanding sales channels for processed products**.
- It is also important that the offshore wind industry actively contributes, in cooperation with local governments, to the "**UMIGYO**" initiative promoted by the Fisheries Agency, which aims to revitalize fishing villages through industries linked to fishing (such as restaurants and tourism).
- It would also be effective for the offshore wind industry and academia to work together to promote research and development on how offshore wind can contribute to the flourishing of fisheries and the fishing industry, such as **aquaculture using floating foundations**. In addition, the **government should provide solid financial support for such efforts**.

EXECUTING PARTIES: G W F A MAIN TARGET SEA AREA: offshore

⑩ In offshore fisheries, where the range of operations is extensive, the national government should take the lead in discussing new mechanisms to gain understanding from offshore fishermen, such as the use of a broad-based fund in the event of unforeseen adverse impacts.

- In the future, offshore wind power development will be promoted to offshore areas including EEZs, and since EEZs are outside the jurisdiction of prefectural governments and the number of fisheries that operate by moving widely in the sea will increase, it will be important to **consider how to contribute to the fishing industry not on a wind farm-by-wind farm basis, but on a wide-area basis**.
- In this regard, it would be effective for the national government to take the lead in **realizing a way to utilize over a wide area the funds** currently being set up for each wind farm. Another idea is to utilize the funds on a wide-area basis to support fishermen in the event of unexpected adverse effects.
- While it is important to continuously study the effects of offshore wind on fisheries, the ocean conditions have changed dramatically in recent years due to climate change, and it can be difficult to isolate whether changes in catches are due to individual offshore wind farms or to climate change.
- From the above perspective, it would be effective to **establish a wide-area third-party organization to evaluate the impacts on fisheries, and based on that evaluation, to have wind farms work together to implement support measures targeting fisheries over a wide area**.

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3. Eleven proposals for co-creating the future of offshore wind and the fishing industry

To make the regional seas attractive into the future, let's develop people who can think about marine use from a broad perspective

EXECUTING PARTIES: G L W F A MAIN TARGET SEA AREA: coastal

⓫ It is essential that industry, government, and academia work together to develop people who can make comprehensive judgments about offshore wind power, the fishing industry, and other uses of the ocean, and consider how to use the ocean for the benefit of the region.

- The regional seas have up until now been managed mainly by the fishing industry, but in order to maintain attractive seas for the region in the medium to long term, it is necessary to strategically consider how to utilize the ocean in a comprehensive manner.
- To achieve this, we need **people who can comprehensively grasp factors such as the coexistence of fishing and offshore wind power, the conservation of "satoumi," and regional development through the marine industry, and who can propose ways of using marine areas in the medium to long term that will bring benefits to the region**.
- In Europe, fisheries liaison officers, who have in-depth knowledge of both offshore wind power and the fishing industry and who coordinate the dialogue, sometimes serve as a contact point for negotiations with fishermen.
- To secure such human resources in Japan, it is necessary for the academic community, with support from the government, to take the lead in **expanding educational and reskilling programs** in collaboration with the offshore wind industry **to train personnel who can act as a bridge between the two industries, as well as to recruit people with experience in the fishing industry**.
- It is also important for the offshore wind industry and those involved in the fishing industry to work together to provide educational institutions and the general public with opportunities to tour offshore wind power plants and to experience fishing through hands-on learning, thereby **making offshore wind power and the fishing industry more familiar to them and sparking their interest**.







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