第二屆
離岸風力發電
國家政策與法律國際研討會

The 2nd International Conference on National Laws and Policy for Offshore Wind Energy

台北場
26-27 October 2016
台北福華國際文教會館, Taipei, Taiwan

高雄場
28 October 2016
國立中山大學海洋科學學院, Kaohsiung, Taiwan

會議手冊暨論文集
Conference Materials and Proceedings

主辦單位：Organizing Institutions
國立中山大學海洋事務研究所 Graduate Institute of Marine Affairs
國立中山大學亞太海洋研究中心 Asia-Pacific Ocean Research Center

協辦單位：Sponsors
行政院農業委員會漁業署 Fisheries Agency, Council of Agriculture, Executive Yuan, R.O.C.
中華民國科技部 Ministry of Science and Technology, R.O.C.
國立中山大學研發處
交通部航港局 Maritime and Port Bureau, MOTC
TIPC
高雄市議員黃柏霖服務處
中華海運研究協會 CHINESE MARITIME RESEARCH INSTITUTE

Offshore Wind Energy Developments in Japan: Dealing with fishermen and other stakeholders

October 27, 2016

Masahiro Matsuura
Meiji University
mmatsuura@meiji.ac.jp

1. Existing offshore turbines

a) Overview

In Japan, only a limited number of offshore turbines have been built so far. One of the first experimental towers was built in Setana, Hokkaido by the local government in 2004 with subsidies from the national government. Two 600kW turbines, each of which was built on a structure supported by multiple pillars, are located inside a small fishing port of Setana. The structure is built almost next to the seawall for the port. A similar project with eight 2.0MW turbines was also implemented in Sakata, Yamagata by a private developer (Sumitomo). These turbines were also built inside the port with protection of seawalls. While these projects seemed to be successful, no other municipalities and private entities followed up on the system elsewhere.

A new wave of offshore wind development in Japan resurfaced in 2010. In Ibaraki Prefecture, a local venture firm developed seven turbines on monopole structures along the coast of Kamisu. A few other experimental projects, funded by the national government, were also completed within a few years after the major earthquake in 2011.

Currently, a total of 27 offshore turbines are in operation. On the other hand, the majority of these turbines are developed almost right next to the shore line. Only a handful of turbines are truly offshore ones and none of these are operating on the commercial basis.

b) Windpower Kamisu

A local entrepreneur, Mr. Mamoru Komatsuzaki, launched his first wind power development projects in 2005 in Tsukuba and succeeded in other on-shore projects in Ibaraki Prefecture. He initiated a new project in the large industrial Port of Kashima (Kamisu City) along the coastline. Seven monopile structures were built from the coast using heavy equipments and started the operation in 2010. Tsunamis after the East Japan Great Earthquake of 2011 affected the coastline of Ibaraki and the poles were in fact impacted by the tsunamis. The structure, however, stood against the tsunamis and no major impact was recorded. Another batch of eight turbines was built in 2014 next to these turbines. This time, the structures were built from the ocean side using a special barge. Currently, 15 turbines are in operation along the coast of Kamisu.

b) NEDO pilot projects

The New Energy Development Organization, a subsidiary of the Ministry of Economy, Trade and Industry, were also keen to develop a new round of offshore turbines in Japan according to the national government's policy. The organization commissioned surveys of multiple sites in Japan and selected two pilot project sites: Choshi City in Chiba Prefecture and Kita-Kyushu City in Fukuoka Prefecture.

The Choshi project is awarded to Tokyo Electric and Power Company (TEPCO). The turbine, 2.4MW, is built on a caisson structure which is located 3.1km off shore from the

community of Togawa. The average water depth is 11.9m. Aside from floating turbines, this Choshi turbine is developed the farthest from the coast in Japan at this moment.
The Kita-Kyushu project is awarded to J-Power, one of the largest power generation firms in Japan. This 2.0MW turbine is situated on an iron-made structure which is built approximately 1.4km with the water depth of 14m.

c) Goto floating offshore projects
In addition to the conventional turbines, Japanese government, universities, and private corporations are experimenting with the use of floating off-shore turbines. One of the reason for developing floating turbines is to deal with a unique topography of the ocean surrounding Japan. Japan lacks in the shallow sea areas and much of the seabed slop is steep. Therefore it is relatively difficult for Japanese developers build bottom-mounted offshore turbines with such topography, compared to European ones.
The Ministry of Environment has long been exploring the use of offshore turbines and has teamed up with Kyoto University and Toda Corporation (construction firm) for experimenting with the technology. A small 100kW experimental turbine was set up near the coast of Kaba Island (Goto Islands), Nagasaki in 2012. It was replaced by a full scale 2.0MW turbine in 2013. The underwater structure is built with concrete tube in which Toda Corporation had expertise. The "experiment" was planned for three years and in 2016, the turbine was handed over to the local municipality of Goto City. Thanks to its mobility, the turbine was relocated from Kaba Island to Fukue Island (5.0km off the coast). Currently it is operated on the commercial basis by a special corporation of the municipality.

d) Fukushima floating offshore project
After the major earthquake in 2011, the public interest in exploring renewable energy surged. Then the Ministry of Economy, Trade and Industry initiated a new experimental project for developing a different design of floating offshore turbines off the coast of Fukushima as one of the government's disaster recovery projects. The coast was once contaminated with radioactive substances and the fishermen in Fukushima were once suspended from operating in the area. The Ministry awarded the project to the University of Tokyo and a consortium of construction firms. Three turbines were supported by slightly different types of metal floating devices. The first 2.0MW turbine started its operation 2013, the second 7.0MW in 2015, and the last 5.0MW in 2016 off the coast of Fukushima, approximately 20km away.

2. Proposed projects in Japan

a) Resource availability
In April 2011, shortly after the earthquake, both the Ministry of the Environment and the Ministry of Economy, Trade and Industry released studies of renewable energy potential in Japan. Theoretically without considering the economic feasibility, a total of 1,600 GW (MoE) or 1,500 GW (METI) can be exploited from the offshore wind power. The MoE's report included an analysis of scenarios on Feed-in-Tariff. At the JPY 20/kWh, the likely capacity is 170 MW if the tariff is guaranteed for 15 years but it increases to 3 GW if the period is 20 years. METI's report provides different scenarios, but its estimate is far higher than the MoE's, ranging from 6 GW to 66 GW.

b) Ongoing projects
i) Kamisu
The Ibaraki Prefecture government, which manages the Port of Kashima, opened a bid for

developing 680 ha of open ocean areas for offshore wind power. The bid was awareded to two companies, Wind Power Energy by Mr. Komatsuzaki and Marubeni, one of the major trading companies in Japan. At this moment, Wind Power has revelaed its plan to build 20 of 5MW turbines in the designated areas that is approximately 1.5 km off the shore. The Wind Power project is expected to start its operation in the late 2017.

ii) Kita-kyushu
The City of Kitakyushu has also been exploring the use of its large port area for the wind power. It even worked with the national government to expand its formal "port" area so that the city government can have the formal authority of managing the area for new wind farm developments. Four areas, total of 2,687 hr, are now designated as "an area for utilizing renewable energy sources" for approximately 60 turbines. In August 2016, the city government has just released its announcement of an open bid procedure for all of these four areas.

iii) Akita
Prefectural government of Akita is also keen on developing offshore wind energy. It has explored the use of Port of Akita and Port of Noshiro and Marubeni is chosen as the primary developer in 2015. Approximately 145 MW of development is expected, and a new alliance of private developers was established in 2016.
Another project is also proposed by Obayashi Construction Company off the coast of Noshiro, Mitane, and Oga communities. Its Method Statement (one of the first documents to be submitted for the EIS permitting procedure) was published in the summer of 2016. The project would involve the maximum of 91 turbines with the total output of 455MW. The prefectural government is supportive of this project as well.

v) Yasuoka
Maeda Construction Company has been planning to develop 15 wind turbines off the shore of Yasuoka Community in Shimonoseki City, Yamaguchi Prefecture. The plan is to build 4MW turbines approximately 1.5km away from the coastline. While the developer is currently studying the site for environmental impact assessment procedures, fishermen from the local community have launched a protest against the project. Several lawsuits have been filed against the implementation of environmental studies for the assessment. The protest group has submitted a petition with 6,000 signatures of community members to the city government in July 2016. The developer is fighting against the protest group in the court and continues its environmental studies toward the submission of environmental impact statement.

vi) Other projects
Aside from these projects, at least four projects are currently explored in Wakkanai Port (Hokkaido), Ishikari Port (Hokkaido), Mutsu-Ogarawa Port (Aomori), and Iwafune (Niigata). A few other projects seem to have been proposed several years ago, but no recent information can be found in the news sources and government web sites.

3. Policy initiatives in Japan
i) Promoting ocean energy
Headquarters for Ocean Policy was established by the Ocean Basic Act of 1999 in order to integrate a range of ocean related polices administered by different ministries, such as the Ministry of Land, Infrastructure, Transport and Tourism, the Ministry of Economy, Trade and Industry, and the Fisheries Agency. In May 2012, the Headquarters announced the Current

Directions for Promoting Ocean Renewable Energy. It is structured around two main themes: R&D and implementation. Toward the R&D, the Headquarters would set up multiple experimental fields for testing new devices, apparently emulating the success of EMEC in Europe. Currently, a total of seven experimental fields are designated, and at four of these sites floating offshore wind turbines would be experimented. For facilitating the deployment of ocean renewable energy, the announcement suggested five policy areas for improvement: 1) coordination with stakeholders, 2) legal instruments, 3) safety standard, 4) environmental impact assessment, and 5) cost reduction.

ii) FIT rate setting

Japanese government introduced the feed-in-tariff system in July 2012 for various kinds of renewable energy such as wind and solar. When the system was introduced, no rate was determined for offshore wind farms and it created uncertainties for facilitating private investments in offshore wind. The price had to be determined by negotiations between the utility companies and the developers for each project. In March 2014, the Ministry of Economy, Trade and Industry finally made an announcement for including offshore wind energy in the FIT system. The rate was determined to be JPY 36/kWh (NTD 11.2), which is approximately 60 percent higher than the ground-based wind energy. Following the decision, multiple privately-funded projects, listed in Section 2 of this paper, were initiated due to the relatively favorable rate.

iii) Direct investments through pilot projects

The first few offshore projects, such as the ones in Choshi, Kitakyushu, Goto, and Fukushima are primarily funded by the national government as a part of its R&D program. The Choshi, Kitakyushu, and Fukushima projects were funded by the New Energy Development Organization, which is a subsidiary of the Ministry of Economy, Trade and Industry. The Goto floating offshore project is funded by the Ministry of Environment, also as a part of technological development.

These projects succeeded in testing the durability and challenges in building offshore turbines in the unique Japanese environment. For instance, the Choshi turbine had a problem with the power cable when a major typhoon hit the area in 2013. The experience led to an improved design for connecting the underwater cable with the turbine. These projects also served as very successful demonstration of these emerging technologies. Before the implementation, local fishermen and other stakeholders were concerned about the possible impacts on marine ecosystem, noise, and other nuisances. Once the turbines are in place, stakeholders were assured about the lack of negative consequences and even started to recognize benefit of having these turbines.

Due to its "experimental" nature, these turbines would be removed after the experimentation period of three years. This condition was effective for persuading the concerned stakeholders in hosting these turbines because the national government guaranteed their removal after three years. However, many of these turbines are likely to be handed over from the national government to the local community and continue their operation after the experimentation period. Following the few years of experiments, local stakeholders gradually recognize the value of hosting these facilities and now they prefer to have them even after the previously-agreed period. For instance, the Goto floating offshore turbine is now operated by the local government at a slightly different location after the experimentation period.

iv) Port areas

One of the major challenges of siting offshore wind turbines in Japan is the need of dealing

with a wide range of stakeholders. Dealing with fishing rights of local fishermen is one major concern for the potential investors. There are many other concerns, such as avoiding the frequently used navigation routes and conflict with national defense uses, that frustrates the developers. To circumvent these concerns, formally designated port areas are currently considered as one of the most promising area for further development of offshore wind power. Under the Japanese maritime law, port areas can be designated by the national government and once designated, the local port authorities (the local prefectural or city governments) have the legal power of managing the area.
At the national level, the Ministry of Land, Infrastructure, Transport and Tourism has the jurisdiction of managing port areas. The Ministry has been promoting the use of underused port areas for offshore renewable energy since the "Current Direction" was announced by the national Headquarters for Ocean Policy in 2012. In June 2012, the Ministry has published a "Manual for Facilitating the Introduction of Wind Power in Port Areas." The manual outlined a procedure for designating "areas for utilizing renewable energy sources" within port areas. When designating such areas, it required local port authorities to establish a local stakeholder committee and also organize an open bidding process before choosing a developer that actually implements the project. The manual was followed by the "Technical Guidelines for Offshore Wind Power Facilities in Port Areas," published in March 2015, which outlines the details of planning and designating areas for such offshore development. Following these policy guidelines, the ongoing developments in Kamisu, Kita-Kyushu, and Akita, described in the previous section, have been approved.
And finally, the Port Act was amended in 2016 by the national Diet and its Article 37(3) allows the port authority to lease parts of port area for renewable energy development and requires an open bidding procedure for selecting the corporation that occupies the area and implements the development.

v) EIA guidelines
The Japanese Environmental Impact Assessment act requires such assessment for wind farm projects with more than 10MW capacity. Capacity of the recent projects proposed by private investors are all over this limit and thus they have to follow the procedures and conduct environmental studies accordingly. One of the major concerns for developers was uncertainties regarding the issues to be studied in the assessment. Because they will have to spend some time, at least an year, in studying the local environment, they wanted to be certain about the issues that they have to cover in the environmental impact statement.
In September 2015, drawing on the lessons from multiple experimental construction of the turbines, the New Energy Development Organization has published a “Reference for environmental impact assessment techniques for non-floating offshore wind turbines.” The document includes multiple case studies of environmental assessment for the organization’s experimental projects. For these projects, assessment was in fact not required by the law due to their sizes, but the organization conducted a wide range of environmental studies as a part of its experimentation program. Meanwhile, the Ministry of Environment, which has the formal authority of environmental assessment procedures, has also been exploring the issues to be studied in the assessment statements. It is still studying options but will publish the final recommendations by the end of fiscal year 2016.

4. Challenges of dealing with stakeholders in Japan

A number of challenges are expected in off-shore wind developments almost anywhere in the world. Those who have properties on the shore, who enjoy the beauty of the sea, are often

worried about visual impacts, as was the case with the Cape Wind Project in Massachusetts, the United States. Environmental organizations are often worried about the impacts on ecosystems, particularly on marine mammals. Fishing industry is worried about the possible impacts on commercially viable catches. Shipping companies, as well as national defense organizations, are worried about possible hindrance to their navigation. Meanwhile, developers are also worried about the investment risks. Without the high FIT rate, it is hard for the developers to justify the high-risk project for their investors. Such non-technical issues are often the major barrier to the deployment of offshore wind technologies.

a) Fishing rights

In Japan, fishing is foremost the major concern for both communities and developers in offshore wind development. Japanese fishermen have traditionally maintained rights for coastal areas in front of their community for several hundred years. Under the current system, local fishermen cooperatives, registered under the Fishery Cooperative Union Law, are entitled to manage designated areas for cultivating certain kinds of commercially viable resources (fish, shellfish, and seaweeds). If their operation will be disturbed by the construction of wind turbines within such designated areas, they are entitled to "just compensation" from the developer. Local prefectural governments, which have the authority of issuing permits for occupying areas in the sea, usually requires a proof of such agreement with the local fishing cooperatives in order to avoid controversies with the local community. Therefore, any developer has to reach an agreement with the local fishing cooperative if it intends to build the turbine near shore.

Even if the developer wants to build turbines farther off shore where no fishing right is formally designated to fishing cooperatives, it still has the risk of being sued by the fishermen who operate commercial fishing in such areas for "damages." In fact it is difficult for developers to initiate a development in such areas because anyone can claim to have operated commercial fishing in the area for the purpose of demanding compensation.

In order to circumvent this kind trouble, many Japanese developers are now seeking development within major industrial port areas. Commercial fishing activities within the designated port areas are generally not permitted and the local fishing cooperatives were in fact already compensated when such industrial ports were developed. Therefore, developers do not have to worry about the negotiation with local fishermen cooperatives if the turbines are built only within the port areas.

A few of the early experimental projects such as Choshi and Goto, however, were developed in the open sea areas where local fishermen had some power. In addition, due to the restriction imposed on public funding, the developers were not allowed to compensate local fishermen financially. They had to negotiate for a voluntary consent of the local fishermen to host a turbine in each of these communities. Aside from the limited time allowed for the experimentations (i.e., the turbines would be removed after three years of experimentation period), multiple factors contributed to their successful negotiation. First, they hired the local boats (fishermen) for many of their operation, such as environmental studies and some survey/construction related activities. It meant new job opportunities for these fishermen. Second, these projects were one of the first national projects and triggered a sense of pride in hosting such projects among the local residents. For instance, well-known political figures and foreign visitors came to these small fishing villages, which would never happen without the offshore turbines.

b) Bird strike

The Wild Bird Society of Japan has been one of the active voices against wind farm projects when the turbines would have major risks to wild birds and their migration. The

organization was quite active in the past when the early on-shore projects were explored in Japan. Following the controversies across the country, the national government and the developers sought to restore the relationship with the organization and in fact, the organization has been involved in a number of studies for preparing environmental impact statements as well as in the study group for establishing national guidelines. Developers are now quite careful about avoiding the migration routes in selecting the site. In addition, they have to conduct studies on migratory birds in the environmental impact statement and the Minister of Environment, who has the formal power of reviewing the environmental statement, can pressure the developer to minimize the risk to wild birds.

c) Low-frequency noise

On-shore projects are often criticized for the low-frequency noise from the blades. There have been a number of law suits by the nearby residents against wind farm operators for the health damages from the low-frequency noise. On the other hand, neither the government nor the court has formally admitted such health impacts from the low-frequency noise as of this writing. The Ministry of Environment is conducting studies on such noises but hasn't made any standard regarding the permissible noise level. Because this issue is well published among the popular media, those who protest against offshore projects (e.g., Yasuoka) point to the possible low-frequency noise from the proposed offshore projects. Even though the noise level is one of the issues to be studied in the environmental impact assessment, the controversy can easily escalate because of the lack of formal standard. The health impacts have not already been acknowledged by the government through scientific studies, but it does not necessarily mean that such impacts do not exist at all. On the other hand, many of the offshore projects are located at least a kilometer away from the residential areas and it is likely that the concern will become a real hurdle for the developers. In addition, many of current projects in Japan are proposed within the port areas where only industrial uses are permitted along the shore.

c) Visual impacts

While none of the offshore project has been protested by local stakeholders for visual impacts, it can be a possible reason for local protests. In the past, an on-shore project in Izumo, Shimane Prefecture was fiercely protested by local communities due to its negative impact on the sunset view from one of the area's main sightseeing spot. Its developer was forced to change the proposal and move 10 planned turbines to another location. Again, this issue is unlikely to be a major hurdle for the projects proposed in the port areas due to their already industrialized landscape.

d) FIT rate setting

The rate is currently JPY 36/kWh which is considered favorable for the developers. On the other hand, the rate setting committee periodically reviews the rate and it can lower the rate as the cost of introduction reduces in a long run.

When the FIT system was introduced in 2012, the rate for solar photovoltaic power plants (>10kW) were set at very favorable JPY 40/kWh for 20 years. This created a sudden influx in the investment in solar power plants and the proposed generation capacity exceeded the capacities of existing transmission lines. So many investors applied for the permit but didn't implement the project. They maintained the permit (with the guarantee of JPY 40/kWh for 20 years) as an opportunity for future development. Frustrated with such troubles, the Ministry of Economy, Trade and Industry redesigned the system and also lowered the rate to JPY 24/kWh. It also decided to nullify the permits for which the projects are not yet been implemented within certain years.

While the FIT system is unlikely to be faced with similar troubles by the offshore wind projects, the rate can be lowered at any point by the rate setting committee. A long delay in the approval procedure, particularly those caused by local protests, can lead to a delayed schedule for obtaining the approval for the FIT eligibility, leading to a lower FIT rate for that project. The worst case scenario would be the abolishment of the FIT system in Japan, which is unlikely in a foreseeable future but still possible considering some other nations like Germany have decided to do so.

5. Conclusion

Based on observations in Japan, I would argue that the development of offshore wind farms, as well as other kinds of marine renewable technologies, has to consider many institutional issues, in addition to technical options. In my view, these elements include: regulatory environment, political environment, as well as cultural environment. Elements of regulatory environment include environmental impact assessments, marine spatial planning, marine protected areas, and the fishing rights system particularly in Japan. National policies for renewable energy also affect the deployment of such technologies significantly. We should also look at cultural aspects of the ocean space. In the case of Japan, fishing is tied to the long history of coastal communities and sustainable management of common pool resources. And thus the maritime space is not just a subject for monetary compensation. I believe these conditions applies to all offshore wind projects around the world, even if the significance of each factor might be substantially different by nations. Eventually, these concerns must be addressed by involving key stakeholders in the early part of planning processes.

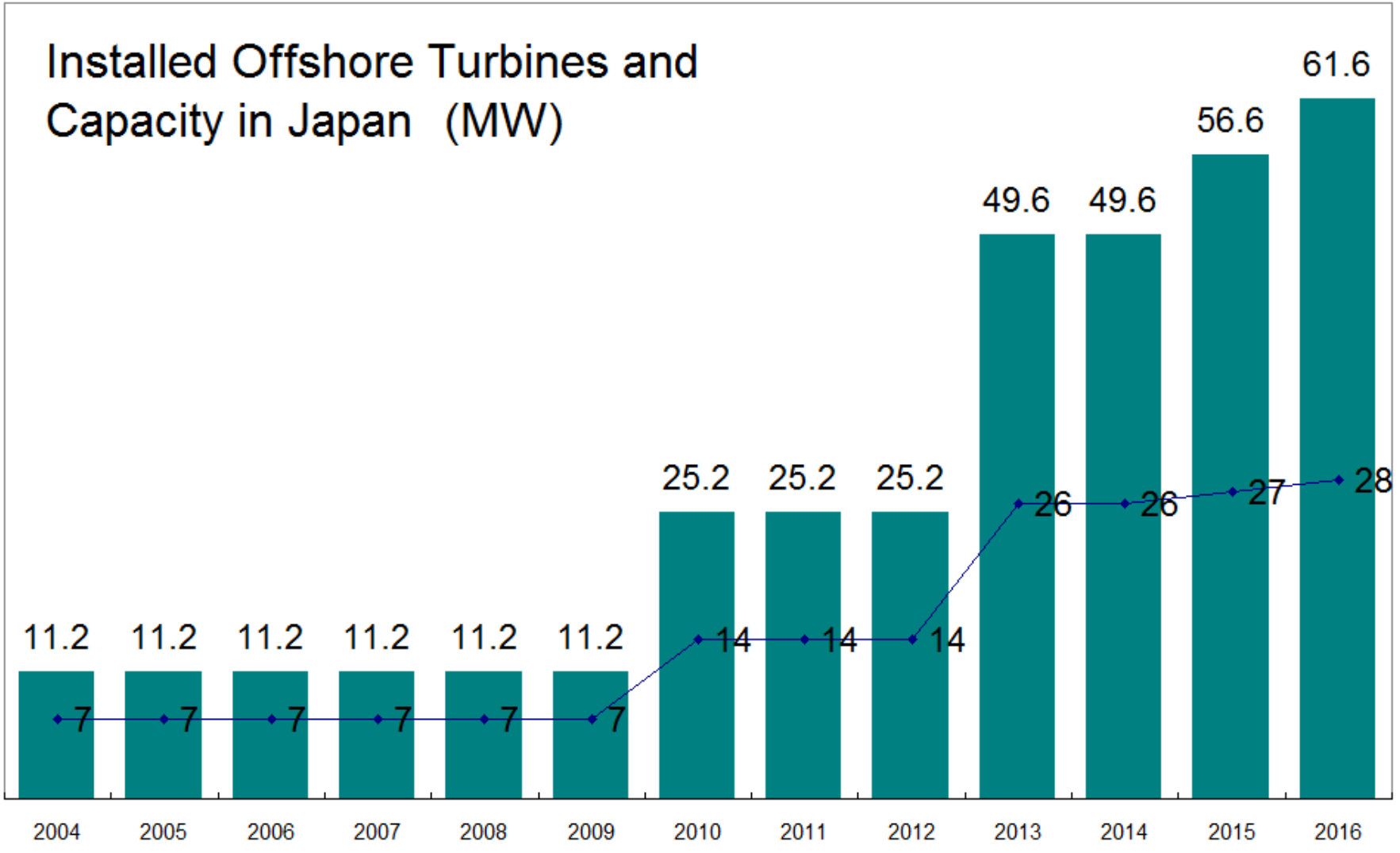
In conclusion, Japan has many technology options, particularly floating offshore turbines with many successes. On the other hand, we haven't been able to utilize the offshore wind resources at the commercial scale. Although many projects have been proposed for utilizing industrial port areas, the port areas still available for further offshore wind developments are quite limited. We need to explore better ways of dealing with local fishing communities and other stakeholders in order to explore offshore wind farms outside the port areas.

Offshore Wind Energy Developments in Japan

Masahiro (Masa) Matsuura [**松浦正浩**], Ph.D.
Meiji University
Graduate School of Governance Studies [**公共政策大学院**]

明治大学
MEIJI UNIVERSITY

Offshore Wind in Japan



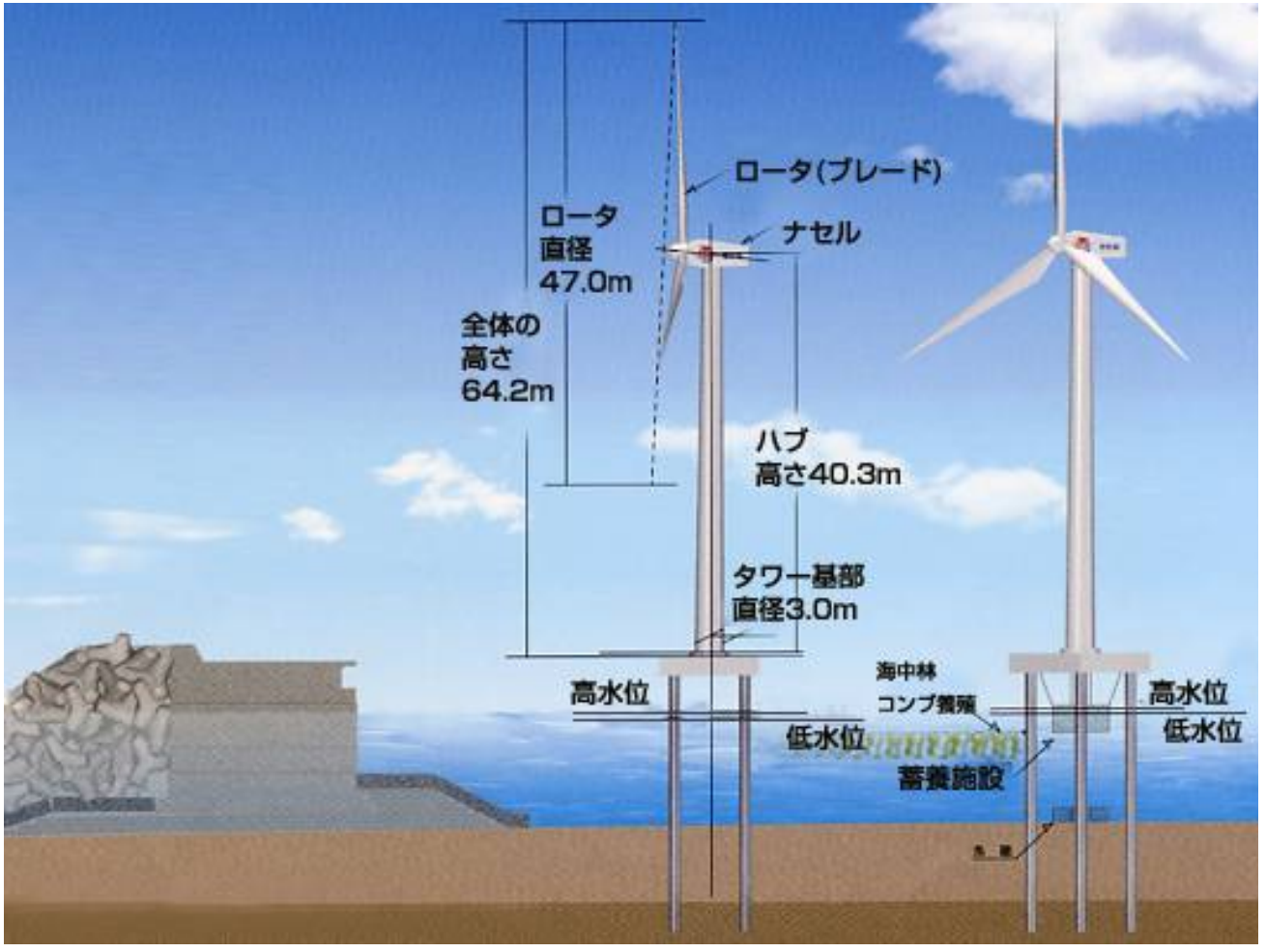
明治大学
MEIJI UNIVERSITY

Existing offshore turbines in Japan

Setana “Kazamidori”
瀬棚　風海鳥

(Source: Setana Town Web Site)

Setana “Kazamidori”



(Source: Setana Town Web Site)

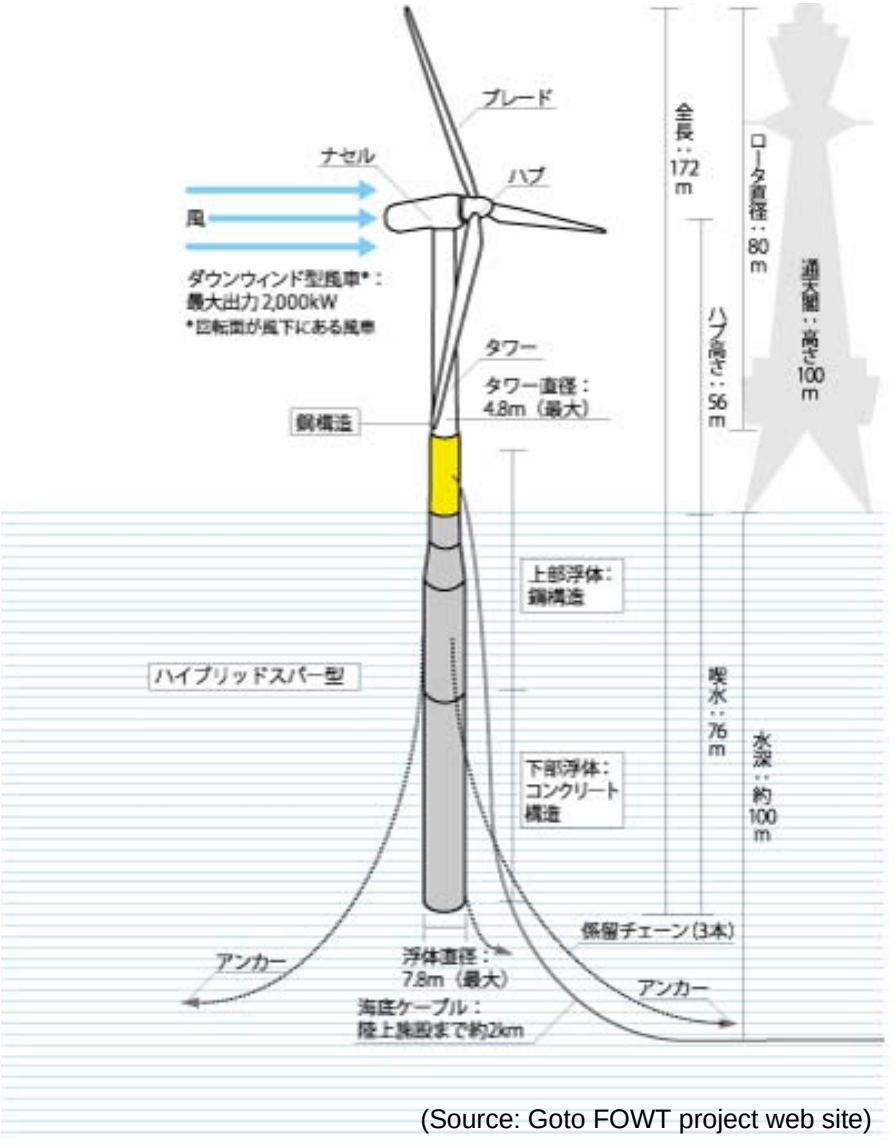
Windpower Kamisu 神栖風力

Choshi Offshore Turbine 銚子洋上風力

(NEDO Pilot Project) 新能源産業技術綜合開發機構実証実験

Kita-Kyushu Offshore Turbine (NEDO Pilot Project) 北九州

Goto Floating Turbine 五島浮体式風車



(Source: Goto FOWT project web site)

Fukushima Offshore Turbines

(Source: Fukushima Offshore project web site)

Resource availability 導入可能量試算

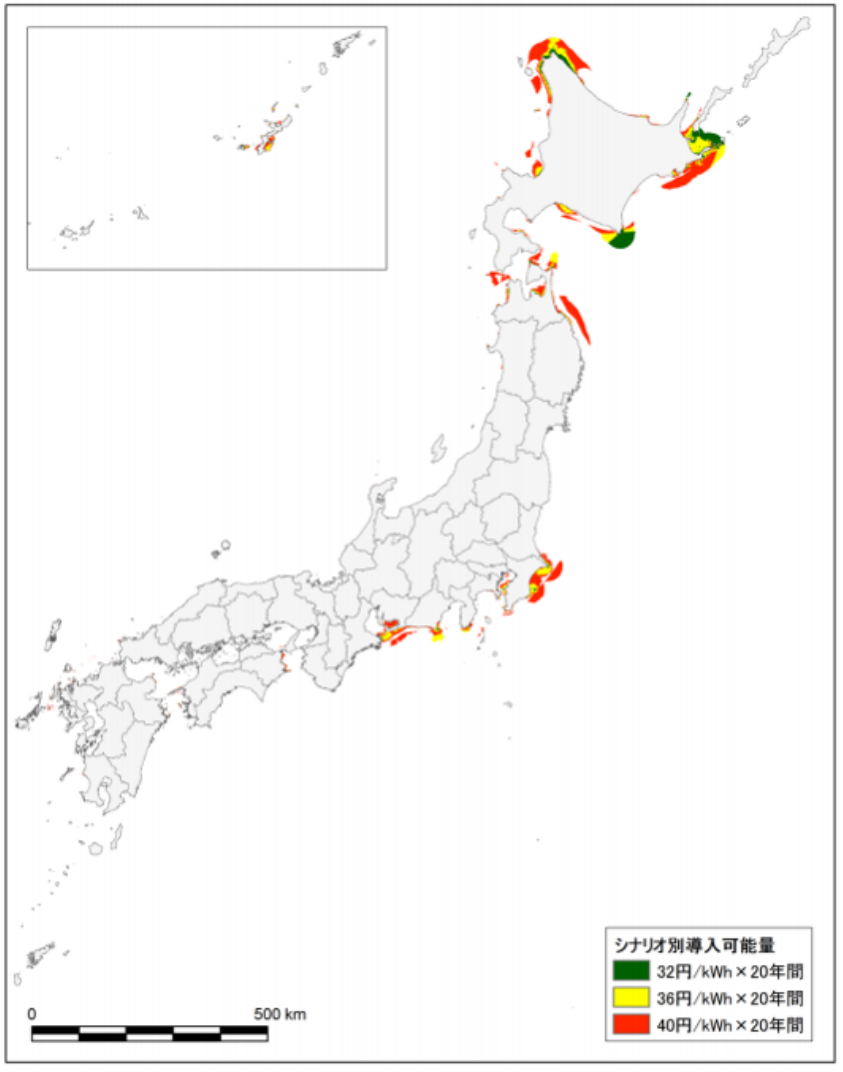


図 3.1-32　洋上風力のシナリオ別導入可能量の分布図

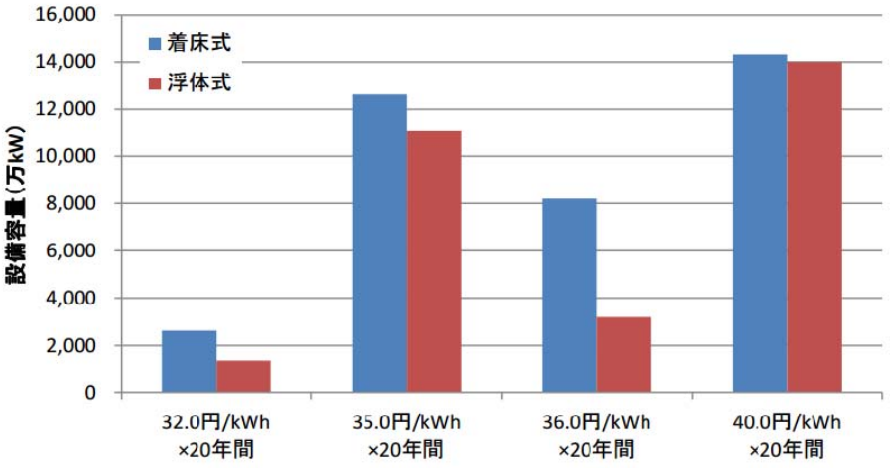


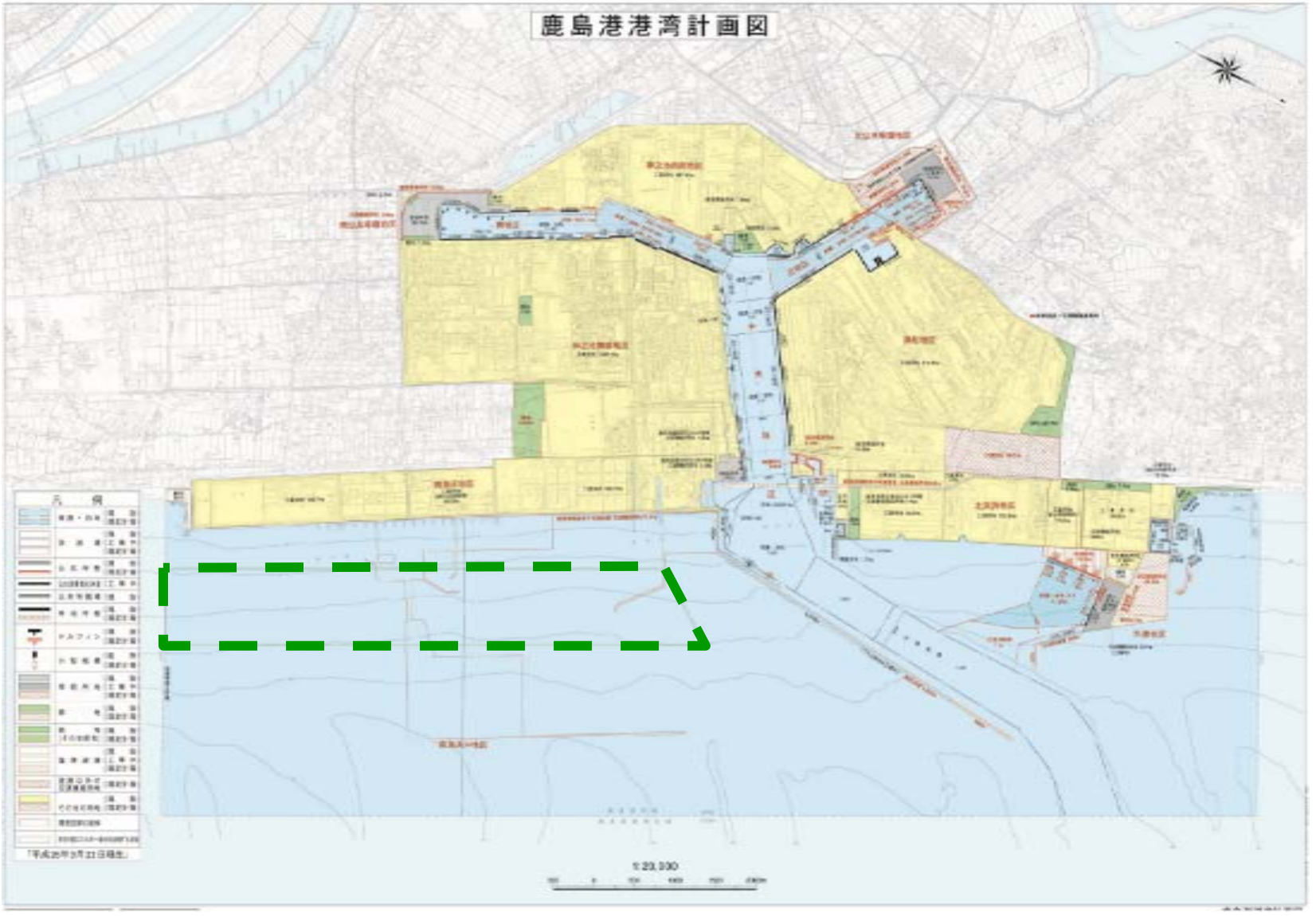
図 3.1-34　洋上風力のシナリオ別導入可能量の集計結果（設備容量　単位：万 kW）

(Source: Ministry of Environment “Report on Zoning Basic Information on Renewable Energy FY 2015”)

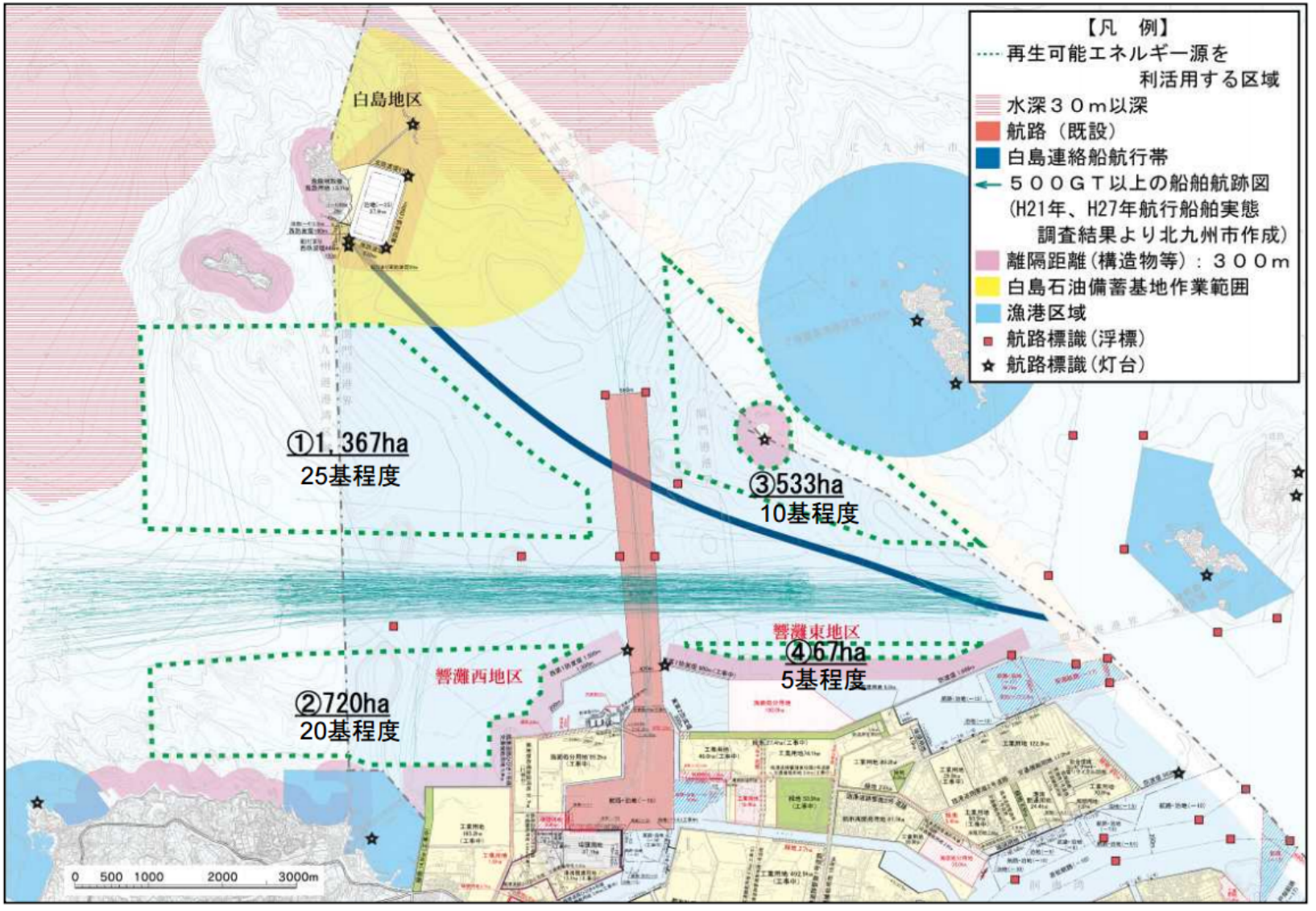
Kamisu Kashima Port 鹿島港

(Source: Wind Power web site)

Kamisu Kashima Port



Kita-Kyushu Proposal



(Source: http://www.mlit.go.jp/common/001112677.pdf)

Proposed projects 計画中事業

Policy initiatives

- ORE promotion by Ocean Policy HQ （海洋政策本部）
  - Ocean Basic Law of 2007 （海洋基本法）
- FIT rate
  - JPY 36/kWh (in 2014) [=10 NTD]
  - Grid connection and implementation issues
- Direct investments （直接投資）
  - Ministry of Environment （環境省）
  - Ministry of Economy, Trade and Industry（経済産業省）-> NEDO
- Designated port areas （港湾区域活用）
  - Ministry of Land, Infrastructure, Transport and Tourism（国土交通省）
- EIA guidelines （環境影響評価指針）
- Japanese version of EMEC （実証実験区画）
  - Renewable energy experimental fields (7 areas)

Fishing rights 漁業権

- Common usage fishing rights（共同漁業権）
  - Local fishermen cooperatives own the right/title in return for maintaining a sustainable marine environment.
  - Extends to a few kilometers off-shore.
- Fishermen cooperatives（漁業協同組合）
  - Established under Fishery Cooperative Union Law （水産業協同組合法）
  - Endowed with the right for “just compensation” for disturbances to their operation.
  - Possible compensation for disturbances outside these designated fishing rights areas (risk to developers).
- Many cooperatives have experience of being compensated for land reclamation and other industrial usage (e.g., nuclear power plants).

Hiring fishermen for the project

Working with the community

Maybe even “better” for fishing?

（1）魚礁効果の調査

◆基礎周辺の潜水観察（H25夏）

イシダイ・イサキ幼魚の群れ

メジナ・イシダイなどの群れ

カンパチ

マダコ

ビデオ

東京電力

Other claimed nuisances

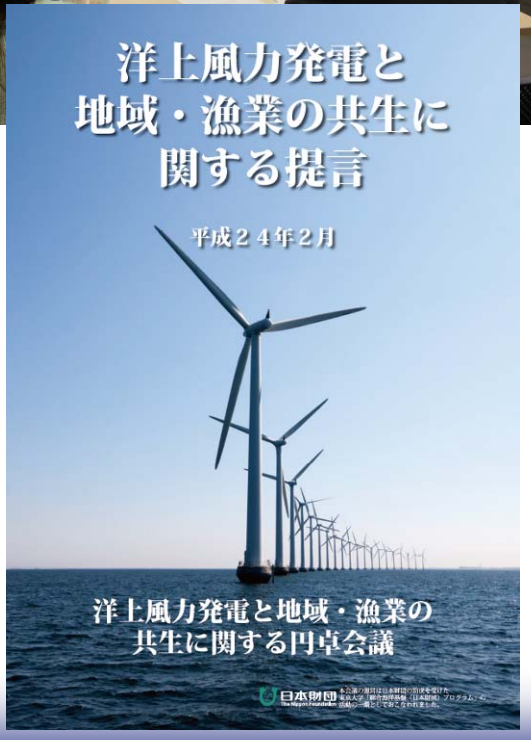
- Bird strike
- Low-frequency noise （低周波騒音）
- Visual impacts （景観影響）

- So far, not much dispute over offshore projects surfaced with these concerns
  - Yasuoka residents claim the risk of low-frequency noise.

Offshore Wind Roundtable

洋上風力発電地域･漁業共生円卓会議

- Convened by the University of Tokyo/Masa matsuura
- **Explore possible mutual-gains (win/win) solutions for three key stakeholders: developer, local community, and fishermen cooperative.**
  - Eurus Energy Holdings
  - Kamisu City Hall
  - Kushikino City Fishermen Cooperative
- Four meetings held in 2011.
- Six recommendations for co-existence of three parties:
  - Environmental impacts
  - Joint venture with fishermen
  - Fishing-friendly design
  - Economic impacts
  - Utilizing for tourism
  - Distributed energy production



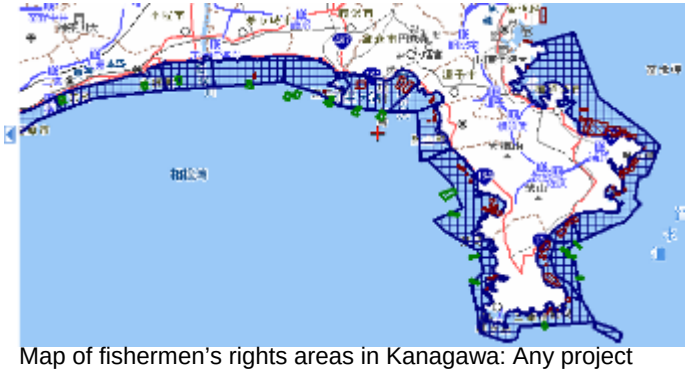
National Grants-in-Aid for Scientific Research
"Basic Research on Marine Spatial Planning and International Network Development" 2015.4-2018.3
海洋空間計画の策定と国際ネットワーク形成に関する基礎的研究

Consensus Building for Offshore Windfarm Siting

Background:

- Veto power of the local fishermen's cooperative
- Local oppositions to offshore windfarms in Japan

Fishermen and community members demonstrating against a 13-turbine proposal in Shimonoseki, Yamaguchi (http://www.asahi.com/articles/ASHB446TJHB4TZNB007.html)



Map of fishermen's rights areas in Kanagawa: Any project proposal in these shaded areas must obtain consent from local fishermen's cooperative

Research question:

- What are the key processes for reaching an agreement with local stakeholders for offshore wind turbine siting?

Method:

- Case studies on recent offshore developments in Japan
- Experimental offshore turbines in Goto (Nagasaki) and Choshi (Chiba) – both required intensive negotiation with local fishermen

Offshore turbine in Choshi and local fishing community of Togawa (Photo: Masa Matsuura)

Outlook

- Use of “Port Areas”（港湾区域）
- Starting with small number of turbines
- Taking advantage of demonstration projects（実証実験）
- Working closely with local residents
- Government (national and local) agencies taking the lead in project （地方行政機關）