



Consensus building with fishermen on offshore wind farms in Japan: Current status and policy recommendations

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ABSTRACT

This study explores the current situation of consensus building with fishermen regarding offshore wind farms in Japan and proposes improvements to the current institutional scheme. Interviews were conducted with fishermen and preceding operators in Akita Prefecture, Japan, where offshore wind projects are ongoing ahead of other regions. The results revealed that uncertainty remains in preceding operators' financial commitments to fishermen because there is no guarantee that the operators will be selected, which is an issue with the current institutional scheme. To address this issue, this study proposes improvements to the current institutional scheme from three perspectives. First, the Government should establish unified standards for operators' financial commitments to fishermen. Second, it should disclose the details of the commitments proposed by preceding operators engaged in consensus building. Third, it should mandate the fulfilment of the commitments by the appointed operator, regardless of whether the preceding operators were selected. These improvements can facilitate the future horizontal deployment of offshore wind farms in Japan within the existing legislative framework.

1. Introduction

Adopted in 2015 as an international framework to address global warming, the Paris Agreement specifies the long-term goal of limiting the average temperature increase since the Industrial Revolution to less than 2 °C. To achieve this goal, Japan has raised tangible targets for reducing greenhouse gas emissions, such as Prime Minister Suga's declaration in October 2020 to achieve 'carbon neutrality by 2050' [1] and his announcement in April 2021 to reduce CO₂ emissions by at least 46% by FY2030 compared to FY2013 levels [2]. Following these targets, the Sixth Strategic Energy Plan released in 2021 presents an ambitious prospect of increasing the share of renewable energy power sources from the current 18% in FY 2019–36–38% by FY 2030, substituting the conventional primary power sources of liquified natural gas (LNG) and coal [3].

In particular, offshore wind power has attracted increasing attention in Japan for three reasons [4]: First, it is not restricted by available land area. Second, it has relatively low environmental impacts. Third, its

large-scale operation can reduce costs. The Act on Promoting the Utilisation of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities (hereinafter, 'Act') [5] was enacted in 2018 and enforced the following year as a standardised regulation to occupy public sea areas outside port districts. Under the Act, offshore wind farms are being implemented in some regions of Japan. For example, in Akita Prefecture and the Goto Islands in Nagasaki Prefecture, operators have already been appointed and preparations for commercialisation are steadily progressing.

The development of offshore wind farms can interfere with the fishing industry by restricting access and navigation [6] and by affecting marine ecosystems both positively and negatively [7–9]. Alexander et al. (2013) [10] showed that fishermen's acceptance influences the success of offshore wind farms. However, offshore wind projects in Japan have just begun, and the actual status of such consensus building remains unclear. This study hence explores the current situation of consensus building with fishermen in offshore wind farms in Japan. To this end, interviews were conducted with fishermen and preceding operators in

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Akita Prefecture, Japan, where offshore wind projects are ongoing ahead of other regions. Furthermore, this paper proposes improvements to the current institutional scheme to smoothly develop consensus with fishermen regarding the future horizontal deployment of Japanese offshore wind farms.

The remainder of this study proceeds as follows. Section 2 reviews the current institutional scheme in Japan. Sections 3 and 4 outline the methods and results of the interviews conducted in Akita Prefecture. Section 5 discusses the issues in the current scheme and proposes improvements thereto. Section 6 synthesises this study and addresses remaining challenges.

2. Review of the current institutional scheme

This section provides an overview of the current institutional scheme for authorising offshore wind farms in Japan, referring to the Act and the Guidelines for the Promotion Zones for the Development of Marine Renewable Energy Power Generation Facilities (hereinafter, 'Guidelines') [11].

The Act defines the process for granting permission to utilise sea areas for offshore wind power projects as follows (Fig. 1) [5]. First, the Minister of Economy, Trade and Industry, the Minister of Land, Infrastructure, Transport and Tourism (hereinafter, 'Ministers'), and the relevant ministerial governors may establish a council (Art. 9(1)), accompanying investigations on the condition of the relevant zone (Art. 8(2)). Second, the Ministers may designate 'promotion zones' for offshore wind farms (Art. 8(1)). Third, the Ministers conduct public offering (Art. 13(1)) and select a business operator (Art. 15(3)). Finally, the Ministers authorise the operator to occupy the sea areas within the promotion zones (Art. 17(1)).

As a process before establishing a council, the Guidelines further specify the processes of 'collection of existing information' and 'selection of "promising areas"' [11]. The government selects 'promising areas' on the basis of the literature and information provided by prefectures and business operators. The Guidelines prescribe that stakeholders must be identified, and their consent must be obtained to initiate a council. Promising zones selected will follow the procedure from the establishment of a council onwards, as stipulated in the Act [5].

Notably, the Guidelines state that for actual operations, any hindrance to fishery operations should be thoroughly confirmed with the relevant fishery groups before establishing a council, and the council should not be established if there is any hindrance [11]. This statement reflects the criteria to designate promotion zones stipulated in the Act, that 'it is expected that the operation of the marine renewable energy power generation business will not hinder fisheries' (Art. 8(1 v)) [5].

The Act states that a council may be established as a forum for consensus building amongst stakeholders. However, according to the Guidelines, fishermen's agreement on offshore wind farms is not to be reached at the council, but rather at the stage of the 'collection of existing information' before the promotion zone is designated. This means that consensus with fishermen should be largely achieved when the council is established.

3. Method

We conducted unstructured interviews with fishermen and one of the preceding offshore wind operators in the Oga-Katagami-Akita district in Akita Prefecture, Japan (Fig. 2). The aim was to clarify the actual operational status of the current institutional scheme and consensus-building processes with fishermen. This area was selected as the ideal site for the case study because it was designated as a promotion zone in September 2022 under the Act, ahead of other regions in the country, and consensus-building processes had already been completed.

Interviews with the preceding operator were conducted on 9 November 2021, 30 November 2021, 16 February 2022, and 10 March 2022. Meanwhile, interviews were conducted with three fishermen who were members of the local fisheries cooperative in Katagami City, Akita Prefecture, Japan, on 29 November 2021, 23 February 2022, 9 March 2022, and 18 March 2022. We hypothesised that two major groups existed in the population. Namely, (i) fishermen who favoured the offshore wind project from the beginning and (ii) those who had initially opposed the project but changed their opinion to support it. The first and second interviewees were sampled respectively from each group as representatives. The third interviewee was the head of the local fisheries cooperative, who had been neutral towards the project. Following the interviews, we determined that theoretical saturation had been reached because the interviewees spoke almost identically about the consensus-building processes described in Section 4, although they differed in the positions.

4. Results

This section outlines the processes to achieve a consensus between the fishermen and the preceding operator revealed by the interviews. The focus is on the operator's initiatives to build a consensus and how the fishermen's opinions have changed.

4.1. Initiatives by the preceding operator

In 2019, the preceding operator first presented its business plan to the head of the local fisheries cooperative, which comprised 40 members

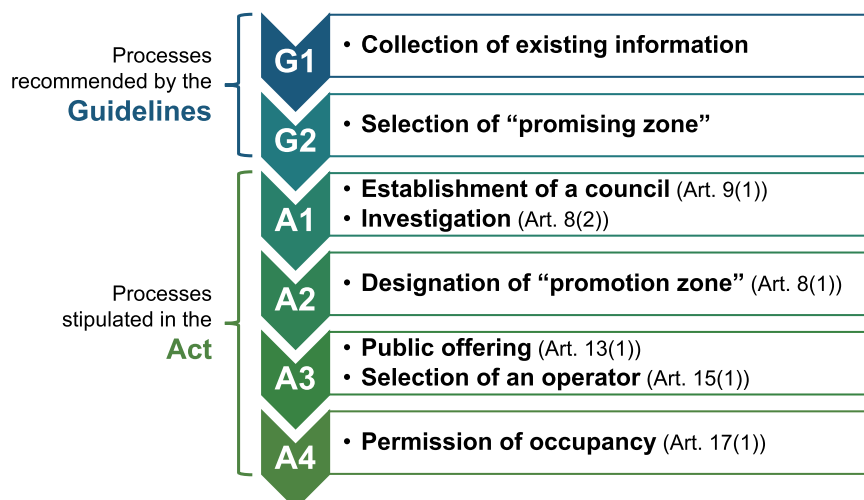


Fig. 1. Authorisation processes of offshore wind farms in Japan.

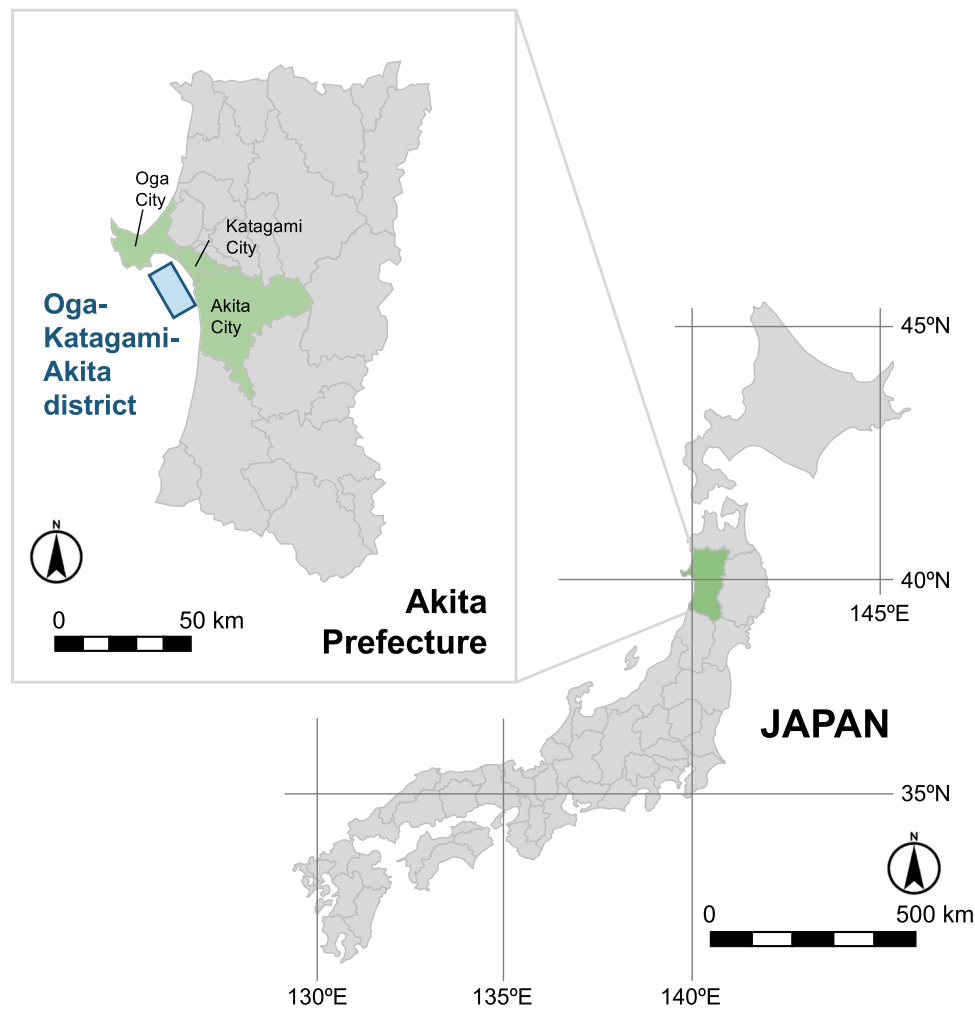


Fig. 2. Map of study area.

in total. After obtaining the head's approval to explain the project to the member fishermen, the operator held the first briefing to exchange opinions with the fishermen. This briefing had two main objectives. First, the operator intended to provide fishermen with basic information about offshore wind farms, which most of the fishermen were unfamiliar with. Another objective was to ascertain the status of approval or disapproval amongst fishermen, along with collecting the opinions of those who opposed the project.

At the end of the first briefing, only several members of the fisheries cooperative agreed to the project, and the rest were neutral or opposed to it. The operator continued to visit and explain the project to fishermen to increase the number of supporters. The operator held three briefings before reaching a consensus in February 2021. In the briefings, the operator emphasised that the project was premised on coexistence with the fishing industry. As the fishermen deepened their understanding of the project, they began to ask specific questions, such as how much compensation would be paid to them if they needed to suspend fishing operations during that period.

Besides the briefings, the operator visited the fishermen individually, especially opponents and neutrals. During the visits, the operator gathered specific opinions on why some fishermen were against the project; the aim was to develop strategies to persuade fishermen at the briefings. However, some fishermen in opposition did not participate in the briefings or accept the operator's visits. Thus, the operator did not have sufficient opportunities to explain the project to them. To reach out to such opponents, the operator sometimes sought the cooperation of fishermen strongly in favour of the project.

4.2. Changes in fishermen's opinions

Most fishermen initially objected to the project for two main reasons. First, they harboured a sense of aversion to the operator's entrance into fishing areas. They were aware that the sea areas planned for offshore wind farms were their ancestral workplaces and felt uncomfortable allowing an external company to come in with the project plan. Second, they were concerned about the decrease in fish catch. Offshore wind farms can undeniably affect marine ecosystems and fish catches in the future. Such impacts vary amidst different sea areas, making it difficult for the operator to assert the level of impact.

Whilst many fishermen initially opposed the project, many changed their opinions to support it following the two points in the negotiation with the operator. First, the operator promised to compensate fishermen for their income during the construction period, when fishing would not be possible. The operator presented a specific amount of compensation for fisheries, which was widely approved by the fishermen. Second, the operator demonstrated a particular contribution to the fishermen. Because the seafloor in the district is predominantly sandy, the fishermen and local government would throw rocks and stones into the sea to serve as fish breeding grounds for the past decade. The operator committed to future support for such a region-specific activity, thereby earning the fishermen's trust.

5. Discussion

Under the current system, operators inevitably engage in consensus

building with fishermen. However, uncertainty remains in the consensus-building processes because there is no guarantee that these operators will be selected. In the Akita case, the operator's presentation of specific fishing compensation was a critical point that turned the fishermen from opposing to supporting the offshore wind project. However, whereas operators may engage with local fishermen to achieve a consensus, this effort does not guarantee the operators' selection in the later public offering process. The fishermen must decide whether to accept the project, with no guarantee that the preceding operators who devoted efforts to consensus building will be appointed nor that the proposed financial commitment will be fulfilled. This uncertainty in consensus building can be an obstacle to horizontal deployment in Japan.

We witnessed in Akita that the actual consensus-building processes were grounded on fisheries compensation. However, the Act stipulates the requirement for designating promotion zones that 'it is expected that the operation of the marine renewable energy power generation business will not hinder fisheries' (Art. 8(1 v)) [5], leaving compensation outside the scope of discussion. Instead, the Guidelines state that the presence or absence of hindrance to fisheries is to be confirmed with respect to *cooperation and co-prosperity* between offshore wind farms and fisheries [11].

Meanwhile, the Japanese institutional scheme would not discourage operators' financial commitments to fishermen¹ geared towards cooperation and co-prosperity with fisheries rather than compensation for potential fishery losses. Under this premise, we propose improvements to the current institutional scheme from three perspectives to address the above-mentioned issues thereof. First, the Government should establish unified standards for operators' financial commitments to fishermen. Second, it should disclose the details of the commitments proposed by preceding operators engaged in consensus building. Third, it should mandate the fulfilment of the commitments by the appointed operator, regardless of whether the preceding operators were selected. Implementing the first recommendation can prevent preceding operators from offering exorbitant 'compensation', thereby guaranteeing the feasibility of the second and third recommendations. We expect that these measures will augment operators' contribution to consensus building by enabling them to commit to the details of financial commitments towards cooperation and co-prosperity with fisheries, even under the uncertainty of whether they will be selected. Such government commitment to the consensus-building processes can facilitate horizontal deployment.

Implementing this recommendation does not require any amendments to the Act. Rather, it can be accomplished by operational changes within the existing legislative framework, such as revising the Guidelines. Therefore, the recommendation is practically feasible and immediately effective.

6. Conclusion

This study elucidated that uncertainty in financial commitments by preceding operators is an issue in the current institutional scheme for offshore wind farms in Japan. To facilitate the future horizontal deployment of offshore wind farms in Japan, the Government should: (i) establish unified standards for operators' financial commitments to fishermen, (ii) disclose the details of the commitments proposed by preceding operators engaged in consensus building, and (iii) mandate

¹ In addition to direct commitments by operators to fishermen, the Government has also discussed the establishment of funds to promote co-existence and co-prosperity [13]. However, the specific management and operational methods of the funds are to be discussed after the selection of an operator (A3 in Fig. 1) [13], and there remains room for debate on the funds' contribution to the consensus-building processes prior to the establishment of a council (until G2 in Fig. 1), which this paper focuses on.

the fulfilment of the commitments by the appointed operator, regardless of whether the preceding operators were selected. Implementing these recommendations only requires operational changes within the existing legislative framework without amendment to the Act, thus addressing the issues of the current scheme feasibly and immediately.

Still, two problems remain unresolved. First, consensus building in the current scheme appears to rely on personal and fortuitous networks between the preceding operators and fishermen. To change the opinions of fishermen who opposed the project, the important factors are not merely the operator's explanations but also the presence of fishermen who strongly support the project from the beginning. In our study area, fishermen who were acquainted with the operator strongly supported the project, suggesting that the personal network between the operator and fishermen substantially influenced consensus building. However, in future horizontal deployment, reliance on such contingent and region-specific networks may lead to vulnerability in consensus building. To further clarify this point, opportunities remain for future research to investigate the actual situations of consensus building in other regions. Second, as clarified in Section 2, the current institutional scheme considers that the consensus should be largely achieved with the establishment of the council. However, it does not acknowledge the possibility that the consensus may change due to unforeseen circumstances during subsequent discussions, such as natural disasters and the operators' bankruptcy. For successful consensus building, flexible terms and conditions should be established to deal with unforeseen situations that may arise after consensus is reached [12]. Therefore, the Act will need to stipulate the conditions for re-establishing consensus in the post-council processes. That is, the Act should explicitly state that the establishment of a council does not necessarily mean a point of no return. Implementing this measure requires fundamental amendments to the law, unlike the method proposed in this study, and therefore, deserves future study.

CRediT authorship contribution statement

Hideaki Shiroyama: Project administration, Supervision, Writing – review & editing. **Kensuke Yamaguchi:** Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Supervision, Writing – review & editing. **Satoshi Tajima:** Conceptualization, Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

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Data availability

No data was used for the research described in the article.

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