Lists of modifications to the manuscript based on the comments from the reviewer.

Comment #1

"Line 56: "For floating offshore wind turbines to be accepted as one of the main power sources in Japan, the LCOE (levelized cost of energy) must be reduced to an order of 10 JPY/kWh (about 0.11 USD at the exchange rate of 2021) or lower to achieve grid parity. In the first offshore wind auction in Japan in 2021, FIT (Feed-in Tariff) for a floating offshore wind project at offshore Goto was 36 JPY/kWh. That is a much higher FIT than the 60 other bottom-fixed projects in the same auction round, from 11.99 JPY/kWh (0.13 USD) to 16.49 JPY/kWh (0.18 USD). A bold cost reduction will be necessary."

<-- COMMENT: Please show the reference which confirms those numbers are definite. LCOE discussion is ongoing therefore it may be misleading.

Modification: We have added the following reference.

https://www.meti.go.jp/shingikai/enecho/denryoku_gas/saisei_kano/pdf/075_s01_00.pdf

Comment #2

Line 72: "Technology development is a key driver for cost reduction. Innovative designs such as larger turbines with higher capacity, floating offshore wind turbines, and improved materials can lead to more efficient and less expensive energy generation. Developing technology to simplify and reduce the cost of installation and maintenance is crucial. This includes improvements in vessel design for installation and maintenance, as well as enhanced forecasting and monitoring systems."

<-- COMMENT: System integration cost and its management cost are not described here, of which amount cannot be ignored.

Modification: We have added the following sentence: " System integration cost and its management cost also contributes to a non-negligible portion of the cost."

Comment #3

Line 109: Research Questions

– What are the unique challenges surrounding floating offshore wind in Japan?

– What effort is currently being conducted to address these challenges?

– What are the gaps and what shall be prioritized?

<-- COMMENT: Although the questions refer to the unique challenges of Japan, there are universal challenges as well. Please distinguish the unique challenges of Japan and the universal challenges which however is important for Japan.

Modification: "– What are the unique challenges surrounding floating offshore wind in Japan, and which global challenges remain particularly critical for the nation?"

Comment #4

Line 453: "The Hywind Tampen benefited from authorization granted by the Ministry of Petroleum and Energy based on the previous licenses for survey, exploratory drilling, and petroleum activities, and obtained an authorization from the Norwegian Petroleum Act as was seen as a change to the plans for development and operation and as a modification done to the power supply of the oil and gas platforms. They did not require an authorization from Norwegian Havenergylova or Act on renewable energy production at sea, which would require much longer time and procedures to be in place. The Hywind Tampen project is considered to be among the key particularities of the Norwegian road map and its offshore wind market (Ibrion and Nejad, 2023; Herrera Anchustegui, I., 2020; Herrera Anchustegui, 2020). The Norwegian Hywind Tampen project ***[is a practical example how to reduce the lengthy regulatory authorization]*** ~~*offers a contrasting case study in regulatory flexibility*~~*. By licensing the wind farm under existing petroleum laws to power offshore oil platforms, the project bypassed the lengthier, more complex renewable energy act. This highlights how leveraging existing industrial frameworks can, in specific circumstances, accelerate decarbonization projects. It serves as a useful counterpoint to Japan's highly structured, top-down reform, illustrating an alternative pathway for development driven by specific industrial needs rather than a broad national auction system."*

<-- COMMENT: It is hard to accept the case of treatment of The Hywind Tampen as a contrasting case study in regulatory flexibility in this paper, for which an authorization from Norwegian Havenergylova or Act on renewable energy production at sea was simply not required.

Modification: The main point here is to give an example how others have found a way to reduce the lengthy regulatory authorization. We have now updated the text.

The Norwegian Hywind Tampen project ***[is a practical example how to reduce the lengthy regulatory authorization]*** ~~*offers a contrasting case study in regulatory flexibility*~~*.*

Comment #5

Line 518: "The most promising pathway to close this gap is the development and implementation of digital twins for health monitoring and predictive maintenance."

<<-- COMMENT: Effectiveness of digital twins is based upon the quality of input data. Please explain why digital twins is recognized as the most promising pathway to close the gap even though the authors recognized that the system of gears and bearings that transfers the blade's rotation to the generator is often proprietary and not disclosed by manufacturers, Japanese project developers and operators are left with limited insight into their internal mechanics.

Modification: Digital twin can be physics-based, data-driven or hybrid. A physics-based digital twin can be challenging given the fact that often Japanese operators are left with limited insight into the design of the drivetrain. However, the advances in AI and data-driven models open an opportunity for advanced predictive maintenance. The text has now been modified.

"[One solution to close this gap] ~~***The most promising pathway to close this gap***~~ *is the development and implementation of digital twins for health monitoring and predictive maintenance. A digital twin is a virtual replica of the physical turbine that integrates real-world data to simulate its operational state* ***[which can be physics-based, data-driven or hybrid. A physics-based digital twin can be challenging given the fact that often Japanese operators are left with limited insight into the design of the drivetrain. However, the advances in AI and data-driven models open an opportunity for advanced predictive maintenance.] "***

Comment #6

Line 725: "When designing supply chains in Japan, it is important to take into account the fabrication process, and for this purpose it might be useful to integrate simulations of the fabrication and data collected from prior demonstration projects which are enabled based on the study on the shipbuilding into existing methods of site selection or supply chain logistics."

<-- COMMENT: It has been pointed out in the global market that limited disclosure of prior demonstration projects constrains the learning curve which could be gained by the industry. Please advise how authors how authors make balance between this point and the current description."

Modification: We acknowledge the fact that data sharing has been a challenge and point out the importance of creating a platform for data sharing; linking to what is already mentioned in the discussion part.

Here, limited disclosure of prior demonstration projects can constrain the learning curve of the industry, highlighting the importance of creating a platform for data sharing.