Governing Offshore Wind in the Asia-Pacific: Emerging Regulatory Frameworks

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Abstract

Offshore Wind Power is an important technology option for promoting decarbonisation of the electricity sector globally. Europe has led the development of the industry, however the Asia-Pacific region is projected to emerge as central in the deployment of offshore wind power in the future in capacity terms. In addition to technical and engineering challenges, offshore wind development involves complex governance challenges, involving marine spatial planning, environmental impact assessment processes, connecting to transmission grids, and the design of effective financial incentives. An important question facing governments is the degree to which governance processes for offshore wind power development should be centralised or dispersed to sub-national levels of government. A second important dimension of governance is the extent to which authority over steps involved in project development is retained by the state, or is given to project developers. A key area of interest is the connection right for the transmission grid. We develop a framework for assessing laws and regulations governing offshore wind power development. We then apply the framework against countries in the Asia-Pacific region developing offshore wind power, including Australia, Japan, the People's Republic of China, and Vietnam. The case of the Netherlands, a key European market for offshore wind, is included as a comparative case.

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1. Introduction

Offshore wind power (OWP) is an important technology option for decarbonising the electricity sector globally. Cumulative offshore wind capacity development increased from 160 Megawatts (MW) in 2000 to 34 Gigawatts (GW) by the end of 2020. The International Renewable Energy Agency (IRENA) projects that installed capacity will grow more than tenfold to 382 GW by 2030 under its 1.5 degree Scenario, expanding to 1,129 GW in 2040 and 2,002 GW by 2050 (IRENA, 2021).

Europe has led the development of the OWP sector, with 29 percent of total installations in 2020 in the United Kingdom, 22 percent in Germany, 7 percent in the Netherlands, and 6 percent in Belgium on a capacity basis. The Asia-Pacific region is now emerging as central to industry growth. The Global Wind Energy Council (GWEC) projects offshore wind power capacity growth in the Asia-Pacific to be 10 GW of a total of 23.9 GW installed globally by 2025 (Lee and Zhao, 2021).

In addition to technical and engineering challenges, OWP development involves complex legal and regulatory processes incorporating Marine Spatial Planning (MSP), technical surveying and assessment, connection to transmission grids, and the potential design and implementation of economic incentives. Deployment is recognised as crucial to reducing the cost of offshore wind power globally (Wiser et al., 2021).

Governments in the Asia-Pacific region are following many European jurisdictions in developing legal frameworks designed to provide certainty to companies seeking to develop offshore wind projects. This includes Japan, the People's Republic of China ("PRC"), South Korea, Taiwan, and Vietnam. The Australian federal government also recently passed a legislative framework designed to provide certainty to companies seeking to develop OWP.

Governance can be understood as the rules that manage a process of problem-solving. In the case of OWP, this begins with MSP that identifies locations appropriate for siting an offshore wind project, and moves forward to assessments of the quality of the wind resource, water depth in the location of a potential site, and the subsea surface and its implications for construction and later decommissioning, as well as assessing the potential environmental impact of a proposed project, connections to the transmission grid, and putting in place the infrastructure required for project construction, operation, and maintenance.

Two issues are particularly important for governments to manage. The first is the degree to which regulatory models for offshore wind should be streamlined. In some European jurisdictions – including The Netherlands described below – features such as spatial planning and technical due diligence have been streamlined with the aim of reducing early stage development costs and supporting shorter lead times for project development. A second issue is the extent to which the regulatory model confers authority over the stages required for siting and project development to project proponents, or whether it centralizes authority in government. A key issue is the contract enabling a proposed project to connect to the transmission grid. In some jurisdictions, a lead agency within government takes the responsibility for securing the transmission grid capacity required to enable a project to send electricity to load centres, while in others the negotiation of the connection contract to the transmission grid is in the hands of the developer.

This paper focuses on the twin issues of streamlining and the division of responsibilities between government and developers, and asks whether an regulatory framework is emerging in the Asia-Pacific region. In the next section we introduce OWP market developments in the Asia-Pacific region. We then introduce the analytic framework, and use it to examine key Asia-Pacific markets, before discussing the implications of the analysis.

2. Governining Offshore Wind

Offshore wind power has the potential to play an important role in supporting the decarbonization of the electricity sector globally. The International Energy Agency's (IEA) offshore wind scenario analysis shows that the technical potential for offshore wind is enormous at 420,000 terawatt hours (TWh), equivalent to more than 18 times current

global electricity supply, and notes that offshore wind reaches capacity factors of 40-50 percent, which is comparable to fossil gas fired and coal fired power plants. Variability on an hourly basis is also lower than for solar photovoltaics (IEA, 2019a). The executive director of the IEA has noted that the potential of offshore wind is “near limitless”(IEA, 2019b).

The IEA models the role of offshore wind in its global net zero energy scenario. In the scenario, total renewable share of electricity generation reaches 88% of global electricity generation by 2050. Within this, wind power increases to 350 GW of capacity on a capacity basis, with offshore wind providing a 70 GW share of this, against 630 GW for solar PV. OWP thus represents a little more than 11% of total solar photovoltaic capacity in the global net zero energy scenario (IEA, 2021, 74).

The IEA also models OWP’s growth over time, representing more than 20% of total capacity additions from overall wind power between 2021 and 2050, compared to 7% in 2020 (IEA, 2021, 117-118). The Levelized Cost of Electricity (LCOE) for offshore wind varies by location, but is modelled to fall below that of onshore wind in the key market of China, as well as in the European Union (IEA, 2021, 201).

The role offshore wind will play in supporting decarbonization globally is dependent on technical, legal and regulatory factors affecting the ability to exploit this potential. In the absence of legislation that provides certainty to developers involved in project development, private sector actors are less likely to invest in new projects. Thus IRENA recommends the introduction of regulatory framework specific to offshore renewable energy (IRENA 2021, 23). Issues such as the responsibility for regulatory processes around securing a grid connection right also play an important role in project development.

Targets and timetables for offshore deployment also play an important role in signaling the level of ambition that governments have towards offshore wind (IRENA 2021). Governments across the Asia Pacific have established targets as a signal to the private sector, such as China with a target of 5 GW by 2020, India with a target of five GW by 2022, and 30 GW by 2030, Taiwan, with a target of 5.5 GW by 2025 and 10 GW by 2030, Korea with a target of 12 GW by 2030, and Japan, with a target of 10 GW under development by 2030, and 30-45 GW under development by 2040. Taken together, the

governance of offshore wind power is thus crucial for the speed and scale of development of the technology, and thus its contribution to decarbonisation regionally and globally.

2.1. Streamlining and Centralisation in OWP Regulatory Models

We focus on two areas of comparison in regulatory models used to govern offshore wind power development.

The first is the degree to which regulatory processes are streamlined.

Offshore wind project development involves complex technological and environmental challenges involving multiple stakeholders. Streamlining of the permitting and consenting process is recommended as a regulatory approach that supports that supports the commercialization of offshore wind (IRENA 2021, 23). Some European markets have streamlined features of the marine spatial planning, zone assessment, and other stages in the offshore wind development process. Streamlining has the potential benefit of reducing early stage development costs, including by contributing to shorter lead times required in project development. Shorter lead times would also enable offshore wind technologies to contribute to near-term decarbonization targets within the Asia Pacific. Kao and Pearre (2017) identify opportunities to streamline the Taiwanese legal framework in order to more effectively promote offshore wind deployment, and compare Taiwan's approach to that of Japan.

On the other hand, stakeholder consultation may best be served through processes implementated at a local level. Coordination with stakeholders over the potential impact of offshore wind project development on fisheries, or the potential visual impact of near-shore offshore wind facilities, for example, may be better achieved through local governance. The extent to which streamlining is possible is also likely to depend on national characteristics. For example, the environmental impact assessment process required as a precondition for project development maybe regulated nationally, or at the local level, or both. How regulatory models solve this dilemma - between streamlining in order to reduce compliance costs and regulatory risk - and locally implemented consultation and consenting during the project development process - is a key issue addressed in this research.

A second dimension of governance is where the authority lies for implementing processes involved in siting and project development to project proponents. A key area is the

connection contract enabling a proposed project to connect to the transmission grid. In some jurisdictions, the relevant government authority takes the responsibility for securing the transmission grid capacity required to enable a project to send electricity to load centres, while in others the negotiation of the connection contract to the transmission grid is in the hands of the developer.

The analytic framework developed here enables cross national comparison of legal and regulatory approaches designed to govern the project development process for offshore wind across the two dimensions of centralization, and government or developer control.

In examining regulatory streamlining and the location of authority, we focus specifically on the early stage processes involved in siting and approvals. Adapting Smith (2019), in the first category we include marine spatial planning, offshore wind zone assessment, and technical due diligence processes associated with the selected location such as assessments of wind resources, and geotechnical surveying. In the second category, we focus on the assessment of developer qualifications and the determination of site licences including the awarding of titles, and the responsibility for grid connections.

Table 1: Regulatory Models for Offshore Wind Planning and Approvals

Activity/ Market		Netherlands	Japan	Vietnam	PRC	Australia
Planning	Marine Spatial Planning					
	Location Technical Due Diligence					
Approvals	Developer Qualification					
	Allocation Mechanism					
	Awarding of Titles					
	Grid Connection Responsibility					

Marine Spatial Planning (MSP): MSP engages users in order to coordinate optimal use of the relevant maritime area through coordination with stakeholders (IRENA 2021).

Locational Technical Due Diligence: In locations deemed suitable for offshore wind, issues such as technical assessment of the wind resource, geophysical and geotechnical information, environmental risks, and the availability of transmission grid capacity is an important step in determining suitability for offshore wind development.

Developer Qualification: Project developers are typically required to demonstrate the financial and technical competence required to implement an offshore wind power project.

Allocation Mechanism: The mechanism for alocating leasing rights.

Awarding of Titles: Responsibility for awarding the title to a developer for a given location.

Grid Connection Responsibility: The entity with responsibility for securing the transmission grid connection.

We also briefly describe the economic incentives specific to offshore wind in different markets, focused on price or quantity targets for offshore wind power and the type of economic incentives provided, if any. Each country case follows a standard structure that begins with general introductory information such as the level of ambition in national targets, and the status of offshore wind projects that are either operational or are under development. The main body of the case studies examines governance in each location, focused on streamlining, and the division of responsibility between government and developers. Finally, the case studies address whether there are any proposed changes under consideration to existing regulatory frameworks for offshore project development.

Country cases focus on the Asia Pacific. In addition, we introduce the European case of The Netherlands to enable comparison of the regulatory frameworks developing in the Asia Pacific region, in relation to a leading market in Europe for offshore wind development and deployment. Australia is included in order to understand the degree to which recent legislation is consistent with approaches which have been adopted by governments across the Asia Pacific region, and Europe.

3. Regulatory Streamlning and Centralisation: The Netherlands

The Netherlands is amongst the global pioneers in offshore wind farm development, with a number of demonstration projects emerging in the 1990s (Verhees et al., 2015). The national government initially focused on stimulating the growth of utility scale wind in onshore locations, but uptake was slow, with 447 MW by year end 2000 against a target of 1,000 MW (Ministry of Economic Affairs, 2002). This was largely because decisions on the siting of planned wind farms often led to local opposition (Van der Loos et al., 2021). Policymakers therefore turned their attention towards offshore wind energy, encouraged by unexpected filings for development permits for offshore farms by a number of private project developers (Verhees et al., 2015). In 2002, the Ministry of Economic Affairs published its Energy report titled 'Investing in energy, choices for the future' (Ministry of Economic Affairs, 2002), which concluded that 1.5 GW of offshore wind power by 2010, and 6 GW by 2020 were feasible targets.

Shortly after the same ministry launched the 'Regulation on Environmental Quality of Electricity Production' and related revisions to the *Electricity Law*, which introduced the first Dutch feed-in-tariff (Ministry of Economic Affairs, 2003). These were differentiated by technology type, on the basis of their respective cost of production relative to market prices. The offshore subsidy was set at 97 €/MWh, versus 65 €/MWh for onshore wind farms, and valid for ten years.

This led to the development of two large offshore wind farms which were both supported with investment subsidies on top of their feed-in tariff; the 108 MW NoordZeeWind farm started production in 2007, and the 120 MW Prinses Amaliawindpark was operational in 2008. The Netherlands was amongst the global pioneers; only Denmark and the UK also had utility-scale offshore wind farms (Verhees et al., 2015).

The two first offshore wind farms benefitted from active government support, and developers (Shell/Nuon and Eneco Energy, respectively) that had deep pockets and an appetite to break their way in an potential future growth market. After this first round, however, both government and developers became more reticent. The expectation had been that the government would develop a formal set of procedures and regulations for licensing and operating an offshore wind farm based on experience learned from the two initial projects, but responsibilities for MSP and zone assessment remained with the

developer, and arrangements for grid connection remain unspecified. Subsidy schemes were also weakened, imposing greater financial and regulatory risk on developers (Van der Loos et al., 2021; Verhees et al., 2015). No further offshore farm was developed throughout the next decade.

The situation changed after the national government and various civil society partners signed the 'Energy Agreement' in 2014 (SER, 2013). This process was given impetus from European legislation on renewable energy (European parliament and Council, 2009) and set a headline target for 14% renewable energy by 2020, and 16% by 2023. It further specified targets of 6 GW of onshore wind by 2020, and 4.45 GW for offshore wind by 2023 (SER, 2013). This was followed by the *Offshore Wind Energy Act* of 2015 and accompanying Offshore Wind Energy Roadmap (Ministry of Economic Affairs, 2015a).

The former specified that obligations for site surveying, developer selection, permitting, and awarding so subsides would all be arranged by the national government, and further specified that the grid operator Tennet, controlled and owned by the Dutch government, was obligated to ensure grid connection (Ministry of Economic Affairs, 2015b). All these responsibilities were placed with the Netherlands Enterprise Agency, which would receive the applications on behalf of the Ministry of Economic Affairs. The development permits would be awarded on the basis of a competitive tender, where price was the main criteria, followed by knowledge and experience of the developer and quality of the wind farm's design, amongst others. The roadmap identified six development sites, further sub-divided for the purpose of tenders, with 3.5 GW of tenders held over 2016 to 2020.

The first tender in early 2016 saw an average FIT of 43.7 €/MWh, awarded for a period of 15 years, whilst a second round, in late 2016 saw an average FIT of 24.5 €/MWh. All subsequent tenders received bids for zero subsidy, and the government switched instead to selection criteria entirely based on developer and design quality (Ministry of Economic Affairs, 2020).

This success led to rapid growth of the offshore wind sector, to about 2.5 GW in operation by the end of 2021. The Offshore Energy Roadmap has been updated to reflect this success, with new targets of 49 TWh of generation, from approximately 11.5 GW, by 2030. A further update for a roadmap through to 2040 is currently being designed, and is expected to be adopted by 2023.

The case of The Netherlands may not be as easily translated to other jurisdictions, as the Netherlands is a small country where provincial governments have limited regulatory power. Nevertheless, it suggests regulatory streamlining and centralisation can be a useful tool for enabling rapid deployment of offshore wind. Its lack led to a slump in construction even when both developers and government were initially enthusiastic about the prospects of offshore wind in the early 2000's. Clear regulation and the centralized responsibilities in Netherlands Enterprise Agency then effectively created a one-stop-shop for offshore wind development, and saw a pace of development and cost reductions that the government had not foreseen.

Table 2: The Netherlands OWP Planning and Approvals

Planning		Approvals			
Marine Spatial Planning	**Location Technical Due Diligence**	**Developer Qualification**	**Allocation Mechanism**	**Awarding of Titles**	**Grid Connection Responsibility**
• National govt.	• National govt.	• National govt.	• Auction	• National govt.	• National govt.

4. Emerging Regulatory Models in the Asia-Pacific

4.1. Japan

The Japanese government has announced ambitious plans for OWP deployment. The national government has adopted a target of 10 GW of capacity under development by 2030, and 30-40 gigawatts of capacity under development by 2040, using a mix of fixed bottom and floating offshore wind technologies. It also has adopted price target of 8-9 yen per kWh by 2030[1].

Deployment is underpinned through economic support. The *Renewable Energy Act* of 2012 introduces a technology-specific feed-in-tariff. A 2020 amendment to the Act

[1] Public-Private Council on Enhancement of Industrial Competitiveness for Offshore Wind Power Generation, "Vision for Offshore Wind Power Industry, 15 December 2020. Available at: https://www.enecho.meti.go.jp/category/saving_and_new/saiene/yojo_furyoku/dl/vision/vision_first_en.pdf (Accessed 19 January 2022).

enables the introduction of a feed-in-premium from 1 April, 2022, with the Ministry of Economy, Trade and Industry (METI) determining the timing for different technologies to shift to the FIP. For fixed-bottom offshore projects that come under the *Offshore Promotion Act*, the feed-in-tariff rate is currently set through competitive auction, with the FIT for floating offshore wind set at 36 yen/kWh. Fixed-bottom offshore wind is scheduled to transfer from the feed-in-tariff to a feed-in-premium from 1 April 2024.

OWP targets are supported by national legislation designating the roles of government developers, and stakeholders in planning, approving, and implementing OWP projects. There is a key distinction between OWP projects developed in ports and harbours, and those developed in Japan's territorial waters under the *Offshore Wind Promotion Act*.

The *Ports and Harbours Act* governs OWP project development within areas designated as ports or harbours, and is administered by the Ministry of Land, Infrastructure and Transport (MLIT). There is currently around 683 MW of capacity under development across five locations being developed under the Act.[2] A 2016 revision conferred authority to local port and harbour authorities to designate a location as appropriate for OWP development for up to 20 years. The relevant Port and Harbour Authority is also responsible for MSP and the assessment of potenitial zones, providing harbour maps and information on wind conditions and other survey data. It also awards titles through competitive auction, and approves leasing plans. In doing so, it is required to take advice from local stakeholders. Planning and approvals processes are thus streamlined for OWP development within ports and harbours, although the securing of a grid connection right is negotiated through a connection contract between grid developers and the local transmission and distribution company.

Development opportunities in ports and harbours are limited. The *The Act on Promoting Utilization of Sea Areas for Renewable Energy Generation* ("Offshore Promotion Act") which came into effect from 1 April 2019, provides a governance framework for OWP zone designation in maritime areas up to approximately 12 nautical miles (nm) from

[2] MLIT, Effort to Promote Offshore Wind Power Generation in Support of 2050 Carbon Neutrality, 8 March 2021 (Japanese language). Available at: https://www.mlit.go.jp/policy/shingikai/content/001390170.pdf (accessed 20 January).

shore, and establishes a competitive auction process for leasing a location to a project proponent for OWP development.[3]

There are important differences in the degree of streamlining for OWP projects in general sea areas, and those in ports and harbours. A notable feature of the *Offshore Promotion Act* is the role of sub-national governments in MSP. Prefectures (i.e. local governments) are initially required to submit information about potential locations to the national government, where pre-assessment is carried out prior to the announcing of a potential OWP zone. Technical due diligence including assessment of the available wind resource, subsea surveying, is the responsibility of project proponents.

After a location is designated as a potential zone, Local Deliberative Councils (LDCs) are required by the Act to be established, and are given the authority to coordinate local stakeholder views. LDCs then provide a formal opinion to the governor of the relevant prefecture. A second important role of the LDC is proposing local economic benefit schemes used in relation to a given zone. The size and management of any community fund can differ by location depending on the outcome of location consultations. The awarding of titles is carried out jointly by the Minister for Economy, Trade, and Industry, and the Minister for Land, Infrastructure, Transport, and Tourism.

Japan has thus adopted a hybrid model towards MSP for OWP outside Ports and Harbours, led at both the sub-national and national levels of government. Roles and responsibilities are delineated in the *OWP Promotion Act*, providing certainty about the process.

The awarding of titles occurs through competitive auction, where Japan once again has adopted a hybrid model. Japan's OWP auction system includes both price and non-price elements. Assessments of the technical and financial competence of bidders is carried out by an expert committee situated in the national government. For non-price elements such as the local economic contribution, the governor of the relevant prefecture hosting the proposed project submits a formal opinion, which is then used in auction scoring. The

[3] There are currently no rules governing OWP development in Japan’s Exclusive Economic Zone.

formal decision over the awarding of the leasing right lies with the national minister, with the successful bidder given the right to lease the location for 30 years.

Securing of the grid connection right, on the other hand, is led by the project proponent. In the current legislation the designation of a zone requires a pre-existing transmission grid connection right. The connection right is grandfathered into the auction, and where the auction winner differs from the grid connection right holder, the rights holder is required to transfer it to the auction winner in return for compensation.

To summarise, governance of OWP development in Japan differs by location, with development in ports and harbours – where available capacity is more limited – managed through a streamlined process in which sub-national levels of government manage planning and approvals. For project development within Japan's territorial seas up to 12 nautical miles from shore, on the other hand, the governance framework is less streamlined. Spatial planning and zone assessment is formally determined by the Minister of Economy, Trade, and Industry, and the Minister of Land, Infrastructure, Transport, and Tourism, but the zoning process currently requires the submission of information around OWP potential and stakeholder support from the governor of the relevant subnational level of government. The awarding of titles through the auction system is also formally in the hands of national ministers, but elements of the auction scoring system used to award titles are informed by formal opinions submitted by local government.

There are also differences in the division of responsibilities between government and developers between the two governance frameworks. In the case of OWP in ports and harbours, the provision of information from geotechnical surveying and wind resource assessment is in the hands of the local port authority. In the case of general sea areas, which the long-term targets for OWP pertain to, geotechnical surveying, and wind resource assessment is the responsibility of the project proponent. Securing a grid connection right is the responsibility of the project proponent in both jurisdictions.

Table 3: Japan OWP Planning and Approvals under Offshore Wind Promotion Act

Planning		Approvals			
Marine Spatial Planning	**Location Technical Due Diligence**	**Developer Qualification**	**Allocation Mechanism**	**Awarding of Titles**	**Grid Connection Responsibility**
• National govt. • Local govt.	• Developer	• National govt.	• Auction	• National govt. • Local govt.	• Developer

Proposed Reforms

Changes in the governance of OWP are being finalised. Most crucially, the national government is streamlining and centralising features of the regulatory model by replacing a bottom-up system of spatial planning and developer-led technical due diligence, with a process led by the national government. At present three locations are subject to a demonstration project[4] in which technical due diligence focused on wind surveying, assessing geophysical aspects of a proposed location, and early-stage EIA assessments common required by all project developers, are carried out by service companies on behalf of the national government.

The government is also centralising responsibility for securing the grid connection. A grid connection right is required to be in place in order for a location to be named as an OWP zone, triggering the auction process[5]. Thus, the regulatory model for OWP in Japan is moving towards a greater degree of regulatory streamlining and centralisation of siting and grid connection within the central government. Sub-national governents will continue to play a role in early MSP and the awarding of titles through the auction system. This

[4] The locations are Gan-u and Minami Shiribeshi, Hokkaido, Sakata City, Yamagata Prefecture, and Hirono town, Iwate Prefecture.

[5] The right of the central government, via the Organization for Cross-Regional Coordination of Transmission Operators (OCCTO), to secure a grid connection right was established from October 2021 where additional grid investment is required in order to enable connection to occur. See https://www8.cao.go.jp/kisei-kaikaku/kisei/conference/energy/20210921/210921energy05.pdf (Accessed 24 January 2021).

follows a similar dynamic seen in The Netherlands, which reached a more streamlined model as a result of reforms following initial implementation of a regulatory framework.

Table 3a: Proposed Reforms in Japan Market

Planning		Approvals			
Marine Spatial Planning	**Location Technical Due Diligence**	**Developer Qualification**	**Allocation Mechanism**	**Awarding of Titles**	**Grid Connection Responsibility**
• National govt. • Local govt.	• National govt.	• National govt.	• Auction	• National govt. • Local govt.	• National govt.

4.2. Vietnam

The World Bank estimates Vietnam has 475GW of technical potential for OWP within 200 kilometres of the coast[6], about eight times Vietnam's total installed power capacity as of 2020[7]. The Vietnamese government has adopted tentative OWP targets of 2-3GW by 2030, 9-11GW by 2035, and 21-36GW by 2045 in the draft of the Power Development Plan 2021-2030 (or PDP 8) expected to be issued by the end of 2022[8]. As of 31 October 2021, 10 projects with a total installed capacity of 398.2MW were in operation[9]. All currently operating projects are bottom-fixed OWP farms located nearshore in Mekong

[6] World Bank, Going Global: Expanding Offshore Wind to Emerging Markets. https://esmap.org/offshore-wind%0Ahttp://documents.worldbank.org/curated/en/716891572457609829/Going-Global-Expanding-Offshore-Wind-To-Emerging-Markets, 2019.

[7] Vietnam Energy Institute, Draft Power Development Plan (in Vietnamese). https://moit.gov.vn/tin-chi-tiet/-/chi-tiet/bo-cong-thuong-xin-y-kien-gop-y-du-thao-đe-an-quy-hoach-phat-trien-đien-luc-quoc-gia-thoi-ky-2021-2030-tam-nhin-toi-nam-2045-21618-15.html, 2021 (accessed 1 March 2021).

[8] Vietnam Energy Institute, Draft Power Development Plan (in Vietnamese). https://moit.gov.vn/tin-chi-tiet/-/chi-tiet/bo-cong-thuong-xin-y-kien-gop-y-du-thao-đe-an-quy-hoach-phat-trien-đien-luc-quoc-gia-thoi-ky-2021-2030-tam-nhin-toi-nam-2045-21618-15.html, 2021 (accessed 1 March 2021).

[9] EVN (Electricity Vietnam), Updates on wind power projects by 31/10/2021 (in Vietnamese). https://www.evn.com.vn/userfile/User/tcdl/files/Thong-tin-COD-dien-gio-den-het-ngay-31-10-2021_2.pdf, 2021 (accessed 5 November 2021).

delta provinces, with nearshore defined as being within several nm from the coast. About 50 other projects are in the preparation phase, with a total capacity of around 13GW.

In Vietnam the primary economic incentive is the FIT. The Prime Minister's Decision 37 in 2011 regulated that OWP generators could sell power at a FIT of US$78/MWh for 20 years with no eligibility window[10]. This was replaced by Prime Minister's Decision 39 in 2018 which regulated that OWP projects that started their operation prior to 1 November 2021 could sell electricity to EVN at a FIT rate of US$98/MWh for 20 years[11]. No follow-up incentive mechanisms have been provided, as of November 2021. OWP projects also receive tax exemptions and reductions in common with other renewable energy projects[12]. Import tariffs, for example, are exempted for project materials which cannot be manufactured within Vietnam. Developers are also exempt from income tax for the first four years, receive a 50% reduction for the following nine years, and then a 10% reduction until the 15th year of operation. There are currently no local content requirements for OWP.

In contrast to Japan there is currently no overarching legislation governing OWP development in Vietnam. Instead, the sector is regulated by multiple laws, policies, and organisations. Site development and leasing are governed by the *Law on Marine and Island Resources and Environment 2015*[13] and the *Law on Environmental Protection (LEP) 2020*[14]. OWP planning and operation is mainly regulated by the *Planning Law*[15] and the *Electricity Law*[16]. OWP investment is subject to the *Investment Law 2020*[17], and the construction of OWP plants is regulated by the *Construction Law 2020*[18]. Other laws

[10] Government of Vietnam, Prime Minister of Vietnam's Decision No 37/QD-TTg on Supporting Mechanisms for Wind Power Development Projects, 2011.
[11] Government of Vietnam (2018). Prime Minister of Vietnam's Decision No 39/QD-TTg on Revising and Complementing some Articles in Decision 37.
[12] Government of Vietnam, Prime Minister Decision 2068/QD-TTg in 2016 on National Strategy on Renewable Energy by 2030 with a vision to 2050.
[13] Vietnam National Assembly, Law on Marine and Island Resources and Environment, 2015.
[14] Vietnam National Assembly, Law on Environmental Protection (LEP), 2020.
[15] Vietnam National Assembly, Planning Law, 2018.
[16] Vietnam National Assembly, Electricity Law, 2018.
[17] Vietnam National Assembly, Investment Law, 2020.
[18] Vietnam National Assembly, Construction Law, 2020.

indirectly related to OWP include the *Maritime Code 2015* and the *Fishery Law 2017*[19]. Communist Party of Vietnam policy documents also play an important role in directing industry development. Two key documents for OWP are Resolution 36/NQ-TU in 2018 on "Strategy for Sustainable Development of Sea-based Economy to 2030, Vision to 2045"[20] and Resolution 55/NQ-TU in 2020 on "Strategic Orientation for National Energy Development to 2030[21].

Planning, approvals, and independent regulation of OWP are covered in multiple government documents. Government Decrees 71 in 2015 and 11 in 2021 and Ministry of Natural Resources and Environment (MONRE) circular 18 in 2021 provide general provisions on seabed leasing and permitting[22]. Under these regulations, Provincial People's Committees (PPCs) grant OWP survey licenses to developers up to 6 nm from the coast. A marine area can be assigned to one or more organizations for individual or multiple purposes[23]. OWP permitting has been mainly subject to provisions under the Ministry of Industry and Trade (MOIT)'s Merged Document 10 and circular 07 in 2020[24].

Two key areas in the planning stage not specified for offshore wind are MSP and environmental impact assessments (EIAs). The governance of siting is shared between

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[19] Vietnam National Assembly, Maritime Code, 2015; Vietnam National Assembly, Fishery Law, 2017.
[20] Vietnam Communist Party, Resolution 36/NQ-TU in 2018 on Strategy for Sustainable Development of Sea-based Economy to 2030, vision by 2045 (in Vietnamese), 2018.
[21] Vietnam Communist Party, Resolution 55/NQ-TU in 2020 on Strategic Orientation for National Energy Development to 2030, vision to 2045 (in Vietnamese), 2020.
[22] Government of Vietnam, Decree 71/2015/ND-CP on regulating human activities and transport means within Vietnam's maritime boundaries, 2015; Government of Vietnam, Decree 11/2021/ND-CP on regulating leasing sea areas for individuals and organizations' use and exploitation of maritime resources, 2021; Vietnam MONRE (Ministry of Natural Resources and Environment), Circular 18/TT-TNMT on Regulation on fees for using marine areas under the jurisdictions of Prime Minister and MONRE, 2021.
[23] N.T.X. Son and P.T., Gam, Vietnam's policy for promoting offshore wind power and environmental impact assessment, Environmental Claims Journal (2021). https://DOI:10.1080/10406026.2021.1932335.
[24] Vietnam MOIT (Ministry of Industry and Trade), Merged Document 10/VBHN-BCT providing guidance on implementation of Electricity Law, 2020; Vietnam MOIT (Ministry of Industry and Trade), Circular 07/ VBHN-BCT Regulation on wind power project development and power purchase agreements (to replace Circular 02/2019/TT-BCT), 2020.

central and local authorities, notably PPCs, MONRE, and MOIT. Leases are also allocated on a first-come, first-served basis. While there are no specific regulation detailing the steps involved in the development of an OWP project, developers typically propose a location to the PPC, which consults with central agencies such as MONRE and MOIT. Developers then register the proposal with the PPC. Once registered, developers conduct local wind surveys for at least 12 months, and then prepare a pre-feasibility study to submit to the MOIT for projects under 50MW, or to the Government Office if projects are 50MW and above. MOIT and Prime Minister then consider the inclusion of the proposed project in the national Power Development Plan (PDP). Developers then prepare a feasibility study to submit to the MOIT, and a detailed EIA and a sea survey application to submit to the MONRE. MONRE seeks approval from the Prime Minister. A seabed lease is issued by the PPC (if <6nm) or MONRE (if >=6 nm) on an *ad hoc* basis, subject to the Prime Minister's approval. The PPC then issues an investment certificate.

Taken together, OWP development in Vietnam thus suggest little streamlining in planning and project approvals processes, with local and central authorities taking responsibility for different stages, and locations. Developers take primary responsibility for technical due diligence, and are required to negotiate a grid connection contract and PPA with the state-owned utility EVN, as well as applying for construction permits from the PPC (in consultation with the Ministries of Defence, Transportation, Agriculture and Rural Development, and MONRE) before start ingconstruction. The PPC and the MOIT approve the OWP project post-construction[25].

Table 4: Vietnam OWP Planning and Approvals

Planning		Approvals			
Marine Spatial Planning	**Location Technical Due Diligence**	**Developer Qualification**	**Allocation Mechanism**	**Awarding of Titles**	**Grid Connection Responsibility**
• Developer	• Developer	• National govt. • Local govt.	• First come, first served	• National govt. • Local govt.	• Developer

[25] Vietnam MOIT (Ministry of Industry and Trade), Circular 07/ VBHN-BCT Regulation on wind power project development and power purchase agreements (to replace Circular 02/2019/TT-BCT), 2020.

Proposed Reforms

Marine spatial planning for OWP, including a vision to 2045, is expected to be issued in 2022. That will involve greater inter-sectoral and inter-provincial planning, and will provide details on locations of potential OWP sites, and pre-leasing and leasing procedures.

Beyond this, OWP development remains weakly streamlined and centralised, with tasks divided among multiple agencies involved in OWP. At least nine central agencies are involved in OWP leasing and licensing, and these agencies' tasks have not yet been well defined. The provincial agencies include the PPC and provincial departments of relevant areas also play a role. A one-stop shop mechanism which enables developers to submit applications to a single agency nevertheless may be feasible in the Vietnamese context. The focal point could be the National Steering Committee on Marine Economic Development established in 2020, chaired by the Prime Minister[26]. This focal point could coordinate the process among the involved agencies. This mechanism would facilitate better coordination among the agencies and hence improve efficiency and optimize national interest and public good aspects such as national defence and maritime environmental protection.

Table 4a: Proposed Reforms in Vietnam Market

Planning		Approvals			
Marine Spatial Planning	**Location Technical Due Diligence**	**Developer Qualification**	**Allocation Mechanism**	**Awarding of Titles**	**Grid Connection Responsibility**
• National govt. and/or local govt.	• National govt. and/or local govt.	• National govt. • Local govt.	• First come, first served	• National govt. • Local govt.	• Developer

4.3. People's Republic of China

China began planning for offshore wind development in 2007 through the Medium and Long-term Development Plan for Renewable Energy, which projected installed capacity of OWP in China would reach 1 GW by 2020. Ambition increased in the 13th Five Year Plan

[26] VIET, Policy recommendations for offshore wind power development in Vietnam (in Vietnamese). PN/02 – VIET04.2020/VN, 2020.

of Wind Power (2016-2020) issued in 2016, which included a target of 10 GW under constructiojn, and 5 GW operating, by the end of 2020.

The 14th Five-year Plan (2021-2025) focused on establishing policies to support deployment. Grid-connected offshore wind projects before the end of 2021 were made eligible for FIT, although projects completed after 2021 no longer eligible for FIT. This has provided a strong economic incentive for OWP, with the installation of Chinese offshore wind power capacity reaching 16.9 GW in 2021.

Like Vietnam, and in contrast to Japan, China has no framework legislation for the OWP sector. Instead, “competent authorities” are mandated to undertake survey work and planning and determine economic incentives under the 2005 *Renewable Energy Law*,[27]. The National Energy Administration (NEA) has competency over solar and onshore wind power, while both the NEA and the National Oceanic Administration (NOA) are responsible for OWP given the use of maritime areas.

In 2010 and 2011 the NEA and the NOA issued the Interim Measures on the Administration of Offshore Wind Power Development and Construction (Interim Measure 2010),[28] and the Implementing Rules for the Interim Measures on the Administration of Offshore Wind Power Development and Construction (Implementing Rules 2011).[29] Regulatory processes were further clarified in the 13th Five Year Plan for Wind Energy Development (2016-2020) which emphasized the need to streamline project approvals, and standardise equipment testing certification with the goal of developing a standards covering the entire supply chain including the manufacturing of equipment and construction.[30]

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[27] Renewable Energy Law of the People's Republic of China. Approved by the Fourteenth Meeting of the Standing Committee of the Tenth National People's Congress, and issued by the Order of the President of the People's Republic of China No. 33 on February 28, 2005.

[28] NEA and NOA, Interim Measures on the Administration of Offshore Wind Power Development and Construction. No. 29 [2010].

[29] NEA and NOA, Implementing Rules for the Interim Measures on the Administration of Offshore Wind Power Development and Construction. NO. 210 [2011].

[30] NEA. Wind power development "13th Five-Year Plan". Issued November 2016.

To comply with this requirement, the NOA issued Opinions on Further Regulation on Offshore Wind Power on Marine Use (Marine Use Regulation 2016) in October 2016,[31] and the NEA and the NOA jointly issued the Measures on the Administration of Offshore Wind Power Development and Construction (OWP Measures 2016),[32] replacing the Interim Measure 2010 and Implementation Rules 2011.

Under the 2016 measures the NEA is not required to prepare a national program for OWP development and construction. Instead, a hybrid system based on local planning and central approvals is mandated. Article 9 of the OWP Measures 2016 enables provincial energy departments - including autonomous regions and municipalities directly affiliated with the Central Government - to prepare OWP development plans, and implement grid connection plans. Article 10 stipulates provincial marine departments are responsible for MSP and environmental impact assessments. Coastal counties and prefectures are also encouraged to formulate OWP plans within their jurisdictions, focusing on the use of sea areas, transmission cable routing, and grid connection plans. These proposals are reported to the provincial energy regulator for validation, after which they are incorporated into provincial planning, which are reviewed by the NEA and NOA[33].

The OWP Measures 2016 also require provincial plans to comply with national planning, which contains additional MSP procedures. Specifically, OWP planning needs to be aligned with overall renewable energy development, marine main functional area planning, marine functional zoning, island protection plans and marine economic development plans (Article 3, OWP Measures 2016). In principle, OWP projects should be not less than 10 km from the coast, and should be no less than 10 meters depth. Areas where offshore wind farms cannot be planned are explicitly stated – including all types of marine nature reserves, marine special protected areas, natural and historical heritage reserves, important fishery waters, estuaries, bays, coastal wetlands, bird migration channels, habitats and other important, sensitive and vulnerable ecological

[31] NOA. Opinions on Further Regulation on Offshore Wind Power on Marine Use 2016.
[32] NEA, NOA. Measures on the Administration of Offshore Wind Power Development and Construction. NO. 394 [2016].
[33] After the institutional reshuffle in early 2018, the NOA was merged into the Ministry of Ecology and Environment (MEE), which takes the responsibility of approval previously assumed by the NEA.

areas, as well as areas within designated ecological red lines (Article 7, OWP Measures 2016).

Technical due diligence including geotechnical surveying and wind resource assessment occurs in two ways. Where there is a pre-existing developer, the pre-development work of OWP projects can be completed by developers, and the provincial energy authorities then selects the preferred project through competitive auction. For projects where there is no pre-existing developer government can commission third-party technical institutions with pre-development spatial planning and technical assessments, before inviting bids in an auction setting. In this case, developers are selected based on the criteria of the prospects of their capacity to get land use permissions and grid connection, and supply plans. In the second case, when OWP projects are announced for auction, the spatial planning and zoning have already finished after the "scientific and reasonable" plan principle by the provincial government (Marine Use Regulation 2016).

The authority to approve OWP projects is delegated to the provincial Development and Reform Commission (PDRC) by the National Development and Reform Commission (NDRC). Starting from 2018, China started to implement a competitive auction scheme for wind power projects.[34] The national plan was initially designed for onshore wind, but from 2019 it was adopted by most coastal provinces as the basis to design the auction scheme. Developer capacity and grid connection plans are important considerations in auction scoring, along with the bid price. Each PDRC is allowed to formulate specific scoring rules and indicators for competition auctions, and can assign bid scores, although the bid price is required to represent at least 40 percent of the final score. In addition to the bid price, qualitative elements in the auction scoring scheme require developers to demonstrate they have a good record of operational performance, use frontier technologies, develop optimal technical solutions, and can secure a grid connection.

Titles are awarded by provincial marine regulators, and are separated into two stages. After the outcome of an auction is announced, the winner obtains leasing rights from the local marine regulators. While the OWP is regulated by energy and marine regulators, and development and reform commissions, there is considerable coordination between

[34] NEA. Guidelines for Competitive Auction Scheme for Wind Power (Interim Measures) 2018.

the three regulators. For instance, the provincial energy authority can coordinate and handle relevant procedures such as grid connection, pre-assessment, and environmental impact assessment for large OWP projects (Article 34, OWP Measures 2016). While it is not explicitly a one-stop shop solution, such an arrangement facilitates streamlined approvals.

Like Japan, the PRC thus adopts a hybrid model for planning and approving OWP, with the degree of streamlining depending on whether there is a pre-existing development project, and greater streamlining for greenfield sites. The regulatory framework also divides authority across energy and ocean administration, and the development and reform commissions at the central and local levels which are required to coordinate.

Table 5: PRC OWP Planning and Approvals

Planning		Approvals			
Marine Spatial Planning	**Location Technical Due Diligence**	**Developer Qualification**	**Allocation Mechanism**	**Awarding of Titles**	**Grid Connection Responsibility**
• National govt. • Local govt.	• Local govt. or developer	• National govt.	• Auction	• Local govt.	• Developer

Proposed Reforms

After the Marine Use Regulation 2016 and the OWP Measures 2016 were issued, the OWP planning and approval in China has been stable and there are no further proposed reforms at present. The most prominent changes for Chinese OWP regulation relate to a change in subsidy support. While auctions remain the preferred allocation mechanism, there are also proposed reforms in auction design. The national guidelines for competitive auction was issued in 2018.[35] After the official end of FIT in 2021, local governments follow national guidelines on competitive auctions in developing their own auction schemes. In relation to the central-local dynamics, there remains uncertainty about how local governments will support OWP projects after the end of the FIT. On the one hand, the requirement that the electricity price connecting to the grid be at least 40 percent of

[35] Supra note no. 33.

the auction scheme is designed to encourage electricity prices to decrease. On the other hand, the fiscal capacity of provinces varies, meaning there may be competition among provinces to attract OWP development by providing subsidies support. Such local competition is likely to occur given China's pledge to peak carbon emissions in 2030 and achieve carbon neutrality in 2060.

4.4. Emerging Regulatory Model in Australia

The Australian federal government passed the *Offshore Electricity Infrastructure Act 2021* (OEI Act) into law in December 2021. The OEI Act enables but is not specific to offshore wind power, enabling other technologies in maritime areas.

Unlike other countries, the Australian federal government has not adopted capacity or other targets specific to offshore wind power. The primary target to provide certainty to renewable energy project developers implemented by the federal government is the Federal Large-Scale Renewable Energy Target (LRET), which is technology neutral, and provides for a target of 33TWh of annual additions to renewable energy generation to 2030. There is currently no post-2030 target in place. In addition, renewable energy targets exist at the subnational level. In the state of Victoria, for example, the government has legislated a renewable energy target of 25 percent by 2020, 40 percent by 2025, and 50 percent by 2030 under its Renewable Energy (Jobs and Investment) Act 2017, although this is also not technology specific.

The newly enacted *OEI Act* covers the area from three nm from shore to the edge of Australia's Exclusive Economic Zone. Laws and regulations applied by states and territories operate within three nm, meaning OWP governance is divided between the national government and states and territories.

Under the framework enabled through the Act, the Minister of Industry, Science, Energy and Resources has the authority to declare locations suitable for project development, implying the Department of Industry, Science, Energy and Resources (DISER) carries out MSP for areas within the Act's jurisdiction. Three kinds of license are identified in the OEI Act. Feasibility licences are issued for seven years, and allow the license holder assess the feasibility of an offshore wind project through technical due diligence. Only one feasibility license is issued for a given location, and the process for allocating a feasibility license allows for a competitive process. Commercial licenses are granted to feasibility

license holders, and only one license is issued per location. The holder gaines the right to implement a project within the designated location for up to 40 years, and license extensions can also be granted. The third license relates to transmission and infrastructure, and enables the holder to store and transmit electricity from a given electricity generating infrastructure. The rules governing connection to the grid for large-scale generators (i.e. above 5 MW) are governed by Australia's National Electricity Rules, under which the project proponent is responsible for negotiating connection to the transmission network with the transmission network provider.

Policy and regulation detailing implementation of the OEI Act remain under development. This should detail the process through which the minister identifies a location for potential project development, and the details about how the winner of the competitive phase of the project development process. The expectation is that these details will be announced in 2022.

Table 6: Australia OWP Planning and Approvals under the Offshore Electricity Infrastructure Act 2021

Planning		Approvals			
Spatial planning & zone assessment	**Location technical due diligence**	**Developer qualification**	**Allocation Mechanism**	**Awarding of titles**	**Grid connection responsibility**
• National govt.	• Developer	• National govt.	• Auction (Feasibility License)	• National govt.	• Developer

5. Discussion

The Asia Pacific region is a core area of growth for the offshore wind industry (GWEC 2021). Legal frameworks designed to provide greater certainty to offshore wind project proponents are being introduced emerging across multiple markets, including Taiwan and South Korea in addition to the cases of Japan, Vietnam, the PRC, and Australia, examined here.

OWP development involves complex technical, Industry body the Ocean Renewable Energy Action Coalition notes that regulatory frameworks providing certainty to proponents are an important element in unlocking the potential provided by offshore wind.

Stable policies that provide adequate leasing areas appropriate for development, a clear permitting process, and a route to market that enable management of exposure to energy price fluctuations are identified as key features of a regulatory framework conducive to OWP development (OREAC 2020, 26). Beyond this, experience in European markets suggests that streamlining in the permitting and consenting process can support shorter lead times for OWF project developing, helping to lower costs and regulatory risks. A second potential feature of regulatory frameworks is the centralization of elements of the OWF development process. The case of The Netherlands, introduced above, suggests streamlining and centralization can enable OWP deployment. Against this, the importance of consenting with local stakeholders

The importance of the Asia-Pacific to the global OWP market makes it important to understand the regulatory frameworks being developed in key markets in the region. We have examined the emerging regulatory frameworks governing OWP in the Asia-Pacific region, focusing on the Japanese, Vietnamese, mainland Chinese, and Australian markets. We developed a framework that enables analysis of regulatory streamlining and centralization, asking whether a common regulatory framework is emerging in the region.

The results show that while some streamlining and centralization is implementated across markets, there remain substantial areas in which the authority over permitting and approvals remains with different entities within national and local governments. There are important areas of the permitting and approvals process which are not centralized within government, but rather remain the responsibility of project proponents.

Two implications stem from this analysis. First, given the diversity of legal and regulatory models in the Asia-Pacific, it is important for project proponents to develop capabilities understanding and navigating the particular characterstics of regulatory frameworks being implemented across different markets. This includes local capabilities, given the fact that areas of project planning and approvals have important input from local authorities and stakeholders.

Second, the analysis also suggests that regulatory frameworks remain under development in the key markets of Japan, Vietnam, and Australia. This mirrors the experience of The Netherlands, where streamlining and centralization emerged as responses to a OWF pipeline that had slowed in the absence of appropriate incentives.

There thus remains substantial scope for learning across different jurisductions as governments work to ensure OWF permitting and approvals meets the needs of stakeholders, while enabling offshore wind to support energy transition goals regionally.

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Annex: Comparison Table of Regulatory Models

	Activity/ Market	Netherlands	Japan	Vietnam	PRC	Australia
Planning	**Marine Spatial Planning**	• National govt.	• National govt. • Local govt.	• Developer • (National and/or local govt.)	• National govt. • Local govt.	• National govt.
	Location Technical Due Diligence	• National govt.	• Developer • (National govt.)	• Developer • (National and/or local govt.	• National govt.	• Developer
Approvals	**Developer Qualification**	• National govt.	• National govt.	• National govt. • Local govt.	• National govt.	• National govt.
	Allocation Mechanism	• Auction	• Auction	• First come, first served	• Auction	• Auction (feasibility license)
	Awarding of Titles	• National govt.	• National govt. • Local govt.	• National govt. • Local govt.	• Local govt.	• National govt.
	Grid Connection Responsibility	• National govt.	• Developer • (National govt.)	• Developer	• Developer	• Developer