

BLUE SECURITY

A MARITIME AFFAIRS SERIES

**Securing the blue energy future: offshore wind and the protection
of critical infrastructure at sea in Southeast Asia and Australia**

Dawoon Jung, Febryani Sabatira and Camille Goodman





BLUE SECURITY

The Blue Security Program engages with and facilitates high quality research on issues of critical maritime security across the Indo-Pacific. Bringing together leading regional experts in politics, international law and strategic studies, Blue Security focuses on three key pillars of maritime security: order, law and power.

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Blue Security receives funding support from the Department of Foreign Affairs and Trade, Australia.



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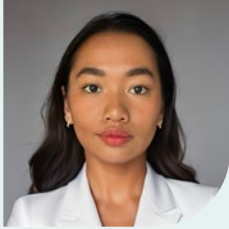
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THE GROWING IMPORTANCE OF GENERATING AND EXPORTING RENEWABLE ENERGY WITHIN THE REGION THROUGH SUBMARINE CABLES PROVIDES A POWERFUL BASIS FOR FURTHER COLLABORATION.

EXECUTIVE SUMMARY

Offshore wind has a critical role to play in the global transition to renewable energy. From Australia—where exploiting just five percent of the technically accessible offshore wind resources would provide more than double the electricity currently generated by the National Electricity Market—to Southeast Asia—where limited land space, long coastlines and the greater speed and stability of offshore wind make it an attractive and scalable source of clean energy. The Philippines, Vietnam and Indonesia, in particular, are recognised as ‘emerging’ offshore wind markets: offshore wind could supply 12 percent of Vietnam’s electricity by 2035 and 21 percent of the Philippines’ electricity by 2040, and Indonesia is seeking to install 39 GW of capacity its waters by 2060.

But with new technologies come new challenges: it is important to understand the potential security threats facing offshore wind farms, and to consider what steps ASEAN countries and Australia could take now—in advance of their development—to enhance the regulatory protections available for this critical maritime infrastructure, and to ensure energy security and maritime security. This requires consideration of both the wind turbines and supporting structures located on the surface and in the water column, by which electricity is generated (and in some cases stored); and the submarine cables laid on or under the seabed, through which electricity is transmitted to land and enters the grid.

While the international legal framework places some clear limits on the measures that coastal states may take to protect offshore platforms and submarine cables in their maritime zones, the first step for coastal states is to

consider whether they have maximised the regulatory opportunities available to them under the law of the sea. This includes ensuring that measures designed to ensure the safety of offshore platforms—in particular, safety zones—are actually established in law, and that they apply to offshore wind infrastructure. Consideration should also be given to establishing criminal offences for intentional damage to such infrastructure. In a similar vein, priority should be given to establishing submarine cable protection zones and criminal offences for wilful or negligent damage to submarine cables—and to ensuring that the submarine power cables associated with offshore wind farms are extended the same protections as submarine telecommunications cables. More broadly, early consideration of policy and planning issues related to the location, layout and operation of offshore windfarms also presents opportunities to strategically and pro-actively consider the measures that may be deployed for their protection.

Of course, this is also a rich area for deepening Australia-ASEAN maritime cooperation. Beyond the deeply shared regional interests in maritime security, energy security and environmental security, the growing importance of generating and exporting renewable energy within the region through submarine cables provides a powerful basis for further collaboration in the protection of offshore wind infrastructure, both above and below the waterline.

WHAT'S ALL THE FUSS ABOUT OFFSHORE WIND?

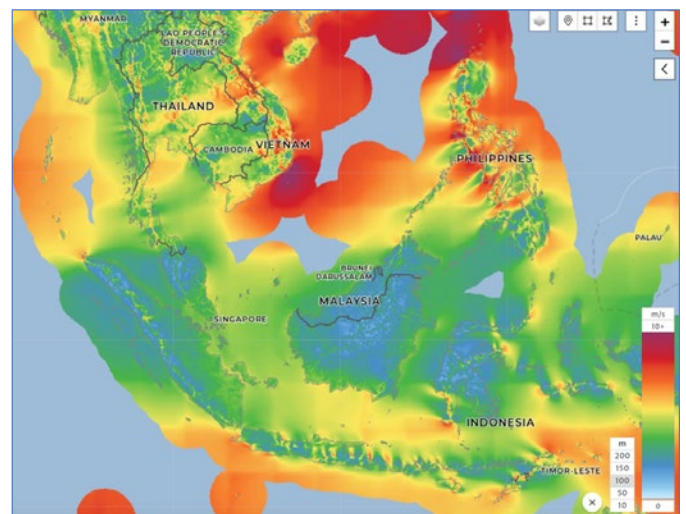
Energy security and maritime security have long been crucially important to each other, from the safe transport of energy resources as part of maritime trade to the availability of fuel for fighting forces.¹ While this has traditionally been viewed primarily through the lens of oil and gas,² the global transition to renewable energy is giving rise to new security challenges regarding the generation, storage and transmission of energy from renewable sources at sea. This includes offshore wind energy, which will play a critical role in the energy transition, not only by allowing countries to reduce their fossil fuel usage and meet clean energy targets, but also by improving energy security and economic growth.

Although offshore wind has long been associated with Europe,³ the industry is expanding rapidly around the globe. A significant amount of offshore wind infrastructure is now installed in North Asia, where China hosts more than half the world's installed offshore wind capacity, and Japan and South Korea are well progressed on their ambitious plans for developing an offshore wind industry.⁴ But offshore wind also has significant potential in Southeast Asia, where limited land space, long coastlines, and the speed and stability of offshore wind make it an attractive and scalable source of clean energy.⁵ The offshore wind potential in Southeast Asia is depicted in **Figure 1**, which shows the sizeable resources in the waters of some countries—particularly Vietnam, the Philippines and Indonesia.

Vietnam's waters are home to 599 GW of offshore wind potential, which could supply 12 percent of Vietnam's electricity by 2035, and up to 30 percent by 2050.⁶ The Philippines has a technical offshore wind potential of 178 GW, which could generate 21 percent of the country's electricity by 2040.⁷ Indonesia, which has the longest coastline in the region and an estimated technical potential of 277 GW,⁸ is seeking to install 39 GW of capacity in its waters by 2060. Other countries have more limited offshore wind resources—including Malaysia (53 GW),⁹

Thailand (7 GW)¹⁰, and Brunei (0.372 GW)¹¹—while the waters of Cambodia, Myanmar, Singapore and Timor-Leste do not have significant offshore wind potential.¹² Although Australia's offshore wind industry is still in its early stages, it provides another useful benchmark in the broader Asia-Pacific context with a technically accessible offshore wind potential estimated at 2,223 GW and a generation capacity far in excess of all current and projected electricity demand across the entire Australian electricity market.¹³

Figure 1. Technical potential for offshore wind in Southeast Asia



Source: *Global Wind Atlas 3.0*, a free, web-based application developed, owned and operated by the Technical University of Denmark (DTU). *Global Wind Atlas 3.0* is released in partnership with the World Bank Group, utilizing data provided by Vortex, using funding provided by the Energy Sector Management Assistance Program (ESMAP). For additional information: <https://globalwindatlas.info>.

But new industries come with new challenges. Offshore wind farms differ from traditional offshore oil and gas infrastructure in some important ways, and the large-scale deployment of offshore wind in this region will raise new and different regulatory issues. For example, offshore wind farms commonly cover a much larger area of ocean than oil and gas platforms, in a much denser way. Offshore wind turbines and sub-stations occupy the surface and water column and are connected to each other (and to shore) by submarine power cables laid on or under the seabed. In some cases, these submarine cable connections may extend to other countries—as envisaged in the proposal to export electricity generated by offshore wind in Vietnam’s waters to Malaysia and Singapore via high-voltage submarine cable.¹⁴ Not only do offshore wind farms cover much larger areas than oil and gas installations, but they may be located closer to the coast, including in high traffic areas near ports, increasing the potential for interactions with other vessels and other industries. And while the construction and operation of offshore wind involves a wide range of specialist vessels, wind farms do not generally have on-site operators; they are monitored and controlled remotely through electronic and telecommunications equipment and maintained by crew operating from service operation vessels (and, increasingly, by remotely operated vehicles).¹⁵

As the demand for power soars in an increasingly ‘electrified’ world, the offshore installations and submarine cables that generate and transport electricity from offshore wind will inevitably constitute part of the ‘critical maritime infrastructure’ that is relied upon to support trade, supply chains, and food and energy security.¹⁶ This will raise new

questions about the steps that coastal states can take to ensure the safety and security of offshore infrastructure in their maritime zones. These questions have important implications for the deployment of offshore wind in the crowded and contested waters of Southeast Asia, which are critical not only to the food and environmental security of their coastal States, but to all States (including Australia) who rely on them for navigation, energy and economic security.

This article lays the groundwork for this important discussion by asking: what maritime security threats will affect offshore wind developments in this region; what options are available under the law of the sea to protect this critical infrastructure; and how is this reflected in the regulatory frameworks of relevant coastal states? In the first sections, we explain the physical components of an offshore wind farm, explore the key maritime security threats to this infrastructure, and outline the legal framework that underpins the regulation of offshore wind in the waters of coastal states. In the latter sections, we apply this framework to the situation in Southeast Asia and Australia. We consider the state of development of the offshore wind industry, and the legal and policy frameworks that have been developed to regulate it, focusing in particular on the extent to which states have established legislation to protect offshore wind infrastructure from maritime security threats. We conclude with some reflections about the state of play with respect to offshore wind in this region, and the steps that Australia and ASEAN could take to effectively protect offshore wind infrastructure, separately and together.



HOW DOES OFFSHORE WIND WORK?

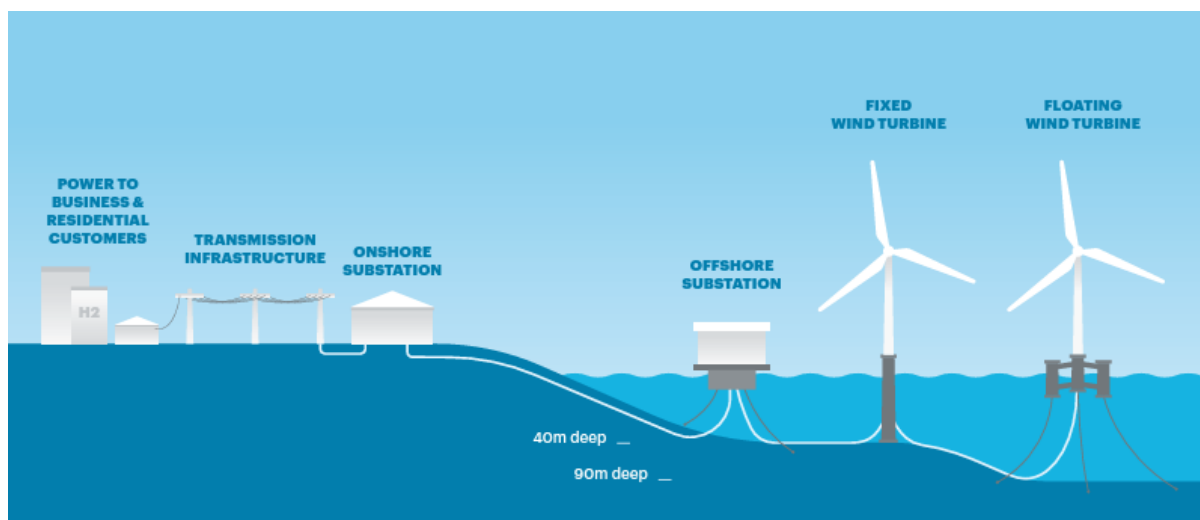
An offshore wind farm uses wind turbines to convert wind into electricity, which is transmitted via submarine cables to offshore substations within the wind farm. These substations convert the electricity to a higher voltage before transmitting it through further submarine cables to onshore substations, where it enters the electricity grid.

Since the optimal locations for harnessing offshore wind can be close to or far from the coast—and in shallow or deep water—offshore wind turbines have been developed in various designs to suit different water depths and seabed conditions. In areas with water depths less than 90 metres,¹⁷ ‘fixed’ turbines are anchored to the seabed using

foundation structures, such as monopiles (single steel piles), jacket foundations (a lattice structure with legs) and gravity-based foundations (with a concrete base).¹⁸ In areas deeper than 90 metres, ‘floating’ turbines are attached to floating platforms, and anchored to the seabed through substructures, such as barge, semi-submersible, spar, and tension-leg platforms.¹⁹

Over the years, wind turbines have grown in size and energy generation capacity—and the technology in this area continues to evolve very quickly.²⁰ While early wind turbines were approximately 17 metres tall and capable of generating just 0.75 MW of electricity each, contemporary

Figure 2. Typical example of an offshore windfarm



Source: NOPSEMA, https://www.nopsema.gov.au/sites/default/files/2021-11/Offshore%20wind%20energy%20brochure_0.pdf

Note 1. In considering energy generation capacity, it is relevant to note that one terawatt (TW) is the equivalent of 1,000 gigawatts (GW) or one million megawatts (MW). These are measurements of capacity, used to refer to the maximum amount of electricity that is capable of being produced at any one time. Reference is also commonly made to terawatt hours (TWH), gigawatt hours (GWH) and megawatt hours (MWH), which are measurements of energy generation, and refer to the amount of electricity that is actually generated over a period of time. For consistency and ease of comparison, the majority of measurements in this article have been converted to GW and GWH.

offshore wind projects employ turbines up to 280 metres tall, using blades longer than 100 metres, which can generate up to 15 MW of electricity per turbine.²¹ The rotation of these blades usually generates electricity at a voltage of 0.69 kilovolts (kV). This is increased to 33 or 66 kV by a transformer within the turbine in order to minimise losses during transmission, and then transmitted via ‘inter array’ submarine cables to an offshore substation within the wind farm.²² These substations collect the electricity generated by multiple turbines and increase the voltage again to 110 to 220 kV, before transmitting it through high voltage ‘export’ cables to onshore substations, where it passes through a transformer station and enters the electricity grid at a voltage of 220 to 380 kV.²³

Submarine power cables are a crucial component of this system. They serve as a backbone to transmit electricity from each turbine to an offshore substation, and then to the onshore substation, where it can be distributed to homes and industries.²⁴ These cables can be anything from 70mm to 300mm in diameter, depending on their capacity and amount of protection. They consist of conductors bundled together with a fibre-optic cable (for metering and operating the wind turbines) into a single thick cable with insulation and corrosion protection, which is laid on or buried under the seabed.²⁵ Given their components, submarine power cables are not light: array cables typically weigh around 60 to 70 kilograms per metre (kg/m), and export cables weight 70 to 150 kg/m, depending on the type and specifications.²⁶

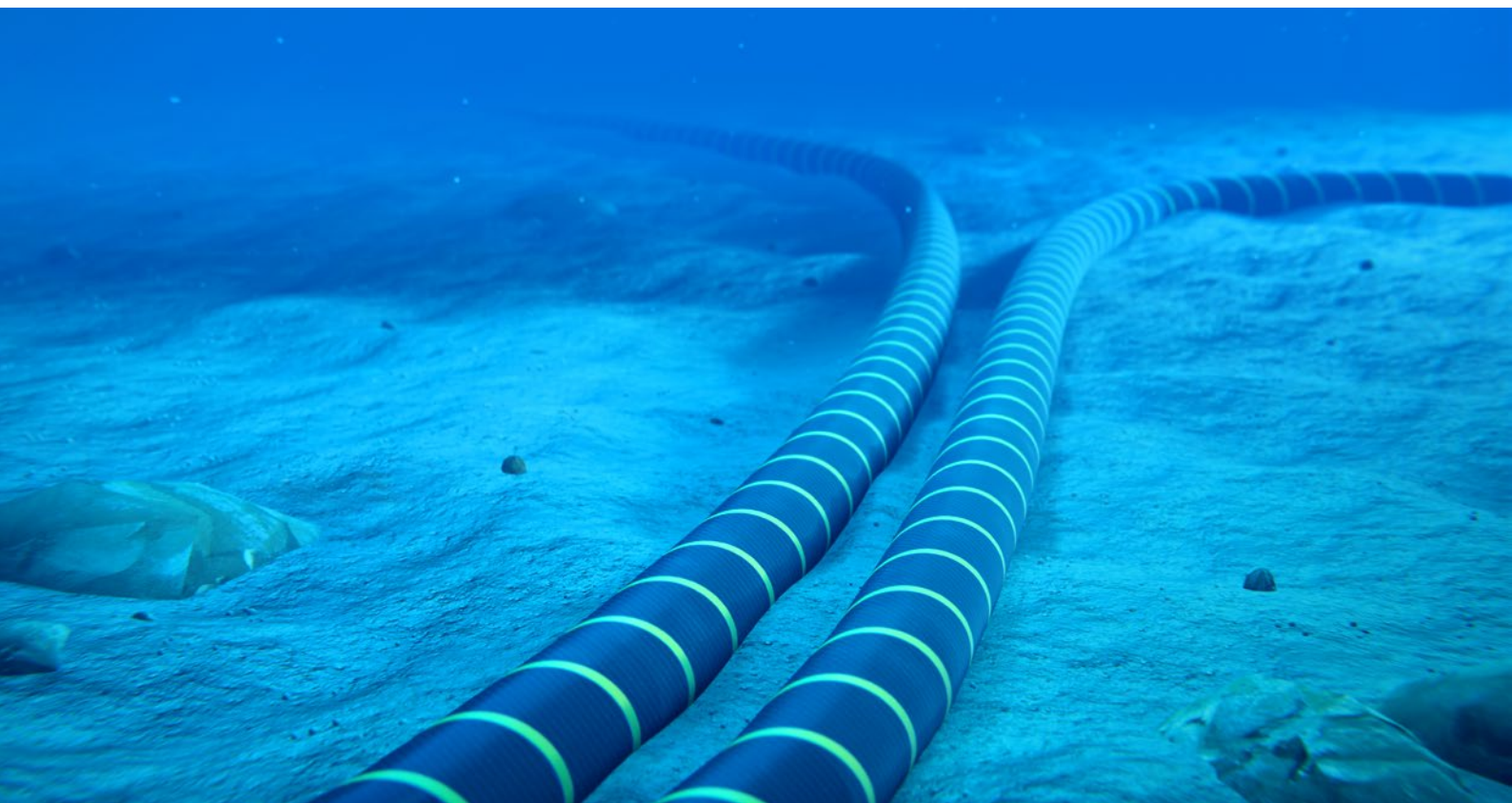
At present, the world’s biggest operational offshore wind farm is the *Hornsea 2* project, which is located approximately 89 km off the English coast, and occupies an area of 462 km². *Hornsea 2* consists of 165 turbines with a capacity of 1.32 GW, and is capable of providing power

to 1.4 million homes through 380 kilometres of export cables.²⁷ This may not be the largest wind farm for too long, though: under Australia’s regulatory framework, licences may be sought to operate offshore wind farms in areas of up to 700km².²⁸

Offshore wind thus differs from traditional offshore industries—in particular, oil and gas—in a number of important ways.²⁹ These differences include the amount and location of the ocean space occupied by offshore wind farms (and the consequent potential for interaction with other uses and users), and their operational requirements—in particular, their reliance on reliable and real-time communications to support remote monitoring and control. They also include the nature of offshore wind resources themselves, which, in contrast to other resources, cannot readily be stolen but must be harnessed in place to generate electricity, and the resulting product transmitted to land. Perhaps most importantly, offshore wind farms have two distinctive components to their infrastructure, which occupy different parts of the ocean space in different ways and have different physical vulnerabilities:

- i. the wind turbines and offshore substations located on the surface and in the water column, by which electricity is generated, transformed, stored and dispatched; and
- ii. the submarine power cables laid on or under the seabed, through which electricity is transmitted from turbines to substations to land and enters the electricity grid.

These differences all have relevance to any consideration of the maritime security threats posed to offshore wind developments.



WHAT ARE THE MARITIME SECURITY THREATS ASSOCIATED WITH OFFSHORE WIND?

The potential maritime security threats to offshore wind farms occupy a broad spectrum, as described in detail by Bueger and Edmunds.³⁰ At one end, there are a wide range of safety issues such as navigational or multi-use incidents involving unintentional damage to offshore wind infrastructure. In the middle of the spectrum there are a myriad of traditional and emerging security threats, ranging from intentional criminal activities for personal gain (or 'blue crimes') such as piracy, fishing, and smuggling of illicit goods and people,³¹ to politically motivated actions by non-state actors such as activists or terrorists. At the far end of the spectrum are the potential threats from inter-state conflict, such as grey-zone activities and operations in disputed maritime areas.³² The focus of this article will be on how the first two categories of maritime security threats—**safety issues** and traditional and emerging **security issues**—affect offshore wind developments, and in particular, the way in which they can threaten both the installations on the surface (wind turbines and substations) and the submarine cables below. Since offshore windfarms are yet to be developed in the Southeast Asian region, these threats can be considered by reference to existing industries in the region (in particular, offshore oil and gas), and by their impact on offshore wind developments in other regions (in particular, Europe and North Asia). Regardless, it is important to bear in mind that offshore wind infrastructure and operations will present new and different opportunities that are likely to result in new and different safety challenges, and to be exploited by criminal groups in new and different ways.

SAFETY ISSUES: NAVIGATIONAL AND MULTI-USE INCIDENTS

Offshore wind farms are vulnerable to all sorts of accidents and unintentional damage. The most obvious examples are navigational incidents involving a vessel colliding with a wind turbine or substation (or with another vessel), and accidental damage to submarine power cables from anchoring, dredging, fishing or construction activities.³³ Such accidents may result in structural damage to turbines or substations, oil or fuel spills from vessels, injury or loss

of personnel, and significant repair costs and operational downtime (which could have important consequences for energy supply). While these risks also apply in relation to traditional offshore energy infrastructure such as oil and gas platforms, in the context of offshore wind they are enhanced by factors such as the limited navigational space and traffic density within or between wind farms or through choke points (including the presence of service operation vessels), the higher density of fixed and floating infrastructure moving on moorings, and reduced space to avoid other navigational hazards.³⁴

To date, most navigational incidents relating to offshore wind farms have involved service operation vessels or construction vessels engaged in windfarm operations. However, there are examples of navigational incidents involving outside vessels—such as the 2023 case of the *Petra L*, a multipurpose vessel carrying 1,500 tonnes of grain, which sailed off course on autopilot and collided with an offshore wind turbine in Germany's *Gode Wind 1* wind farm.³⁵ This was classified as a "serious marine crash" by German authorities, but the practical impacts were minimal: the wind turbine was taken out of operation for investigation and then re-started within 24 hours; the vessel was damaged but able to proceed to port under its own power and without a tug; and there were no casualties. Other examples have had more serious consequences, such as the incident involving the Chinese fishing vessel *ZD Yuyun*, which failed to keep a proper lookout and maintain proper navigation practices while returning from fishing operations, and collided with a wind turbine in the Yellow Sea in August 2024.³⁶ While the wind turbine was left with only minor damage, the vessel flooded and sank, and only eight of the ten crew members were able to be rescued. In another incident, the Maltese-flagged bulk carrier *Julietta D* broke off her anchor and drifted through an offshore wind farm under construction in the Netherlands' waters, damaging the foundations of a wind turbine and the jacket of a transformer station.³⁷

Below the surface, navigational incidents also have the potential to damage submarine power cables, resulting in costly repairs and interruptions to electricity supply.

Depending on the layout of the wind farm, the failure of a submarine cable (particularly an export cable) can result in multiple turbines being put out of service. With an average repair time of three days, this can result in both power cuts and financial losses—indeed, it is estimated that submarine power cable failures account for up to 80% of the total financial losses of offshore wind farms.³⁸ Damage to submarine cables from dragged anchors is particularly common, accounting for approximately 30% of reported incidents each year.³⁹ While the majority of these incidents arise accidentally, there are also cases of intentional damage. For example, on 25 December 2024 the *Estlink 2* submarine power cable, which is used to export electricity between Finland and Estonia, had a failure which Finnish authorities believe was caused intentionally by the *Eagle S* (an oil tanker believed to be part of the Russian shadow fleet) dragging its anchor across that power cable and four adjacent telecommunications cables.⁴⁰ The potential risk of this sort of damage to submarine power cables—and to the installations generating the electricity that they carry—will only increase with the expansion of offshore wind farms.

SECURITY ISSUES: PIRACY, THEFT, SMUGGLING, MIGRATION, FISHING, CYBER ATTACKS, ACTIVISM AND TERRORISM

Beyond these ‘safety’ issues, there are both traditional and emerging ‘security’ issues with the potential to affect offshore wind farms.

Given that Southeast Asia is a known hotspot for piracy and armed robbery at sea,⁴¹ there is a likelihood that offshore wind development will become a new target for this sort of activity.⁴² Offshore wind farms may not attract exactly the same sort of illegal activities as the oil and gas industry: for example, they are less likely to be subject to crimes of ‘petropiracy’, such as hijacking tankers and seizing or siphoning oil or petroleum products. Nonetheless, hijacking of tankers and attacks on oil and gas rigs highlight the vulnerability of offshore industries to exploitation by organised criminal groups.⁴³ In the case of wind farms, this may include the theft of property or valuable materials—such as tools and equipment, copper from wind turbines, or subsea power cables.⁴⁴ It may also include attacks on the various service operations vessels and crew involved in the construction, support and maintenance of wind farms.

Offshore wind developments may also become a location for transnational crime and illicit activities, such as the smuggling of narcotics or small arms. For example, the surge in drug smuggling in Southeast Asia over recent years raises the potential for offshore wind turbines to be targeted as a location for storing or transferring illegal narcotics.⁴⁵ Security threats may also arise from people smuggling and irregular migration. For example, in 2021, a vessel containing 25 irregular migrants was spotted adrift near the Zeebrugge wind farm off the coast of Belgium, causing operations to be disrupted while a rescue was carried out.⁴⁶ This could have great significance in Southeast Asia, where tens of thousands of people are smuggled every year.⁴⁷ Similarly, while illegal fishing is

already a significant issue in Southeast Asia, offshore wind presents new opportunities for unlawful activities. The expansive spatial footprint of offshore wind farms increases the likelihood that unauthorized fishing activities will be conducted within their proximity, introducing potential security risks. In addition to the damage caused to marine resources, such activities pose risks to offshore wind infrastructure, and in particular, to submarine cables.⁴⁸

Beyond the physical threats to offshore wind farms, there is increasing recognition of the risks posed by cyberattacks.⁴⁹ Cybersecurity threats to offshore wind can take a range of forms, including attacks on control and communication systems, data theft, and ransomware attacks. They can be aimed not only at the wind farms themselves, but at vessels operating within them (in particular, autonomous vessels)⁵⁰ and across the supply chain, including the companies engaged in manufacturing, maintenance and monitoring.⁵¹ Such attacks have the potential to disrupt the operation of essential systems within a wind farm, and could potentially result in an incident that endangers the safety of first responders.⁵² For example, on the day of Russia’s invasion of Ukraine in February 2022, a cyberattack on satellite communications affected assets engaged in the remote monitoring and control of 5,800 wind turbines in Germany, some of which took two months to come back on line.⁵³ Similarly, a cyberattack on the German wind turbine company *Deutsche Windtechnik* in April 2022 forced the company to cut off communications between wind turbines and remote monitoring centres, shutting down 2,000 out of 7,500 turbines for two days.⁵⁴

As offshore wind power emerges as a key source of energy production, offshore wind infrastructure is increasingly at risk of being targeted not only by criminals seeking personal gain, but by non-state actors seeking to advance political purposes, ranging from activists to terrorists.⁵⁵ In addition to some of the threats already discussed (in particular, cyberattacks and intentional damage to submarine cables), politically motivated threats to offshore wind infrastructure could take the form of physical attacks, such as the boarding or hijacking of platforms or support vessels, the use of explosives, and even deliberate vessel collisions. This sort of maritime terrorism has long been a recurring concern of the international community, informed by a range of attacks on vessels and offshore infrastructure, and by the potential for the extension of land-based violence to the sea.⁵⁶ Since the 2022 explosion of the Nord Stream undersea gas pipelines, this concern has expanded to include the threat of attacks on critical maritime infrastructure, including offshore renewable energy installations and submarine cables.⁵⁷ But even peaceful protests at sea can involve interference with offshore infrastructure, as demonstrated by the activities of the Greenpeace vessel *Arctic Sunrise* in the 2013 incident involving unlawful entry to a safety zone around the *Pirazlomnaya* oil platform in Russian waters (dealt with in the 2015 *Arctic Sunrise Arbitration*).⁵⁸

Bearing in mind the breadth and gravity of potential maritime security threats to offshore wind infrastructure, we must ask: what does international law say about it? Specifically, what can states do to protect their offshore wind infrastructure from these threats?



WHAT DOES INTERNATIONAL LAW SAY ABOUT IT?

The development of offshore wind farms is underpinned by the legal framework set out in the 1982 *United Nations Convention on the Law of the Sea* (UNCLOS), to which Australia and almost all ASEAN members are party.⁵⁹ UNCLOS allocates jurisdiction both spatially and functionally: spatially, by establishing maritime zones adjacent to the coastline that fall under coastal state sovereignty (the territorial sea and archipelagic waters)⁶⁰ and sovereign rights (the exclusive economic zone [EEZ] and continental shelf);⁶¹ functionally, by allocating specific rights and duties to coastal and other states within these zones—including with respect to the production of energy from the waters, currents and winds, the regulation of artificial structures and installations, and the laying of submarine cables. The rights and duties established in UNCLOS are designed to strike a balance between providing the coastal state with the necessary powers to effectively exercise and enforce its sovereignty and sovereign rights, and the need to preserve the continued freedoms of other states—in particular, the freedom of navigation. Accordingly, the coastal state's rights come with limitations, which have some important consequences for its ability to adopt measures for navigational safety and maritime security with respect to both offshore installations (such as wind turbines and offshore substations) and submarine cables.



OFFSHORE INSTALLATIONS

In the territorial sea and archipelagic waters, the coastal state has sovereignty, subject to the right of innocent passage by foreign vessels. As a result, coastal states have a broad discretion over the protection of facilities and installations, and can establish a range of measures relating to the safety of navigation, including not only traffic separation schemes, but 'areas to be avoided', 'no anchoring areas', 'ship reporting systems', 'vessel traffic systems' and even safety zones, provided that they do not unreasonably hinder or prevent innocent passage.⁶² While foreign ships have the right of innocent passage through these waters, UNCLOS specifically provides that "any act aimed at interfering with ... any other facilities or installations of the coastal state" is considered prejudicial to the security of the latter and does not constitute innocent passage.⁶³ Accordingly, the coastal state can both *make* and *enforce* the laws necessary to protect installations as well as to prevent non-innocent passage in the territorial sea and archipelagic waters.⁶⁴ Beyond this, there are a number of other security-related issues in relation to which coastal states can make or enforce regulations in areas under sovereignty, including: fisheries; customs, fiscal, immigration or sanitary laws; drug trafficking; and "any other activity not having a direct bearing on passage".⁶⁵

In the EEZ and continental shelf, the starting point is (to some extent) reversed: the vessels of all states have the freedom of navigation, subject to respect for the coastal state's sovereign rights over living and non-living resources and "activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds".⁶⁶ This includes exclusive rights over the construction, operation and use of installations and structures for these purposes (such as wind farms).⁶⁷ In this respect, Article 60 of UNCLOS specifically provides that the coastal state may establish "reasonable safety zones" around installations and structures in the EEZ. Safety zones are limited to a maximum size of 500 metres around the installation "except as authorized by generally accepted international standards or as recommended by the competent international organisation"—meaning the International Maritime Organisation (IMO).⁶⁸ Since the purpose of these zones is to ensure the safety of navigation, coastal states may "take appropriate measures to ensure the safety" both of navigation and of the installations and structures. While this would extend to taking enforcement action against a vessel entering such a zone without permission, it does not offer an effective means of protection from maritime security threats. As Kaye has observed, if a vessel intending to damage an installation travelled through a 500-metre safety zone at a speed of 25 knots, it would "pass from the outer edge of the zone to the installation in just under 39 seconds",⁶⁹ which would not give the coastal state time to implement protective or preventive measures. To date, however, the IMO guidelines for giving effect to Article 60 have not included any extension to the size of this zone.⁷⁰

While UNCLOS does not include any provisions specifically enabling coastal states to enforce their laws and regulations for offshore installations, this question was considered by the Arbitral Tribunal in the 2015 *Arctic Sunrise Arbitration*, which found that a coastal state has

the right both to enforce its laws in relation to non-living resources in the EEZ⁷¹ and to take appropriate measures to "prevent interference with its sovereign rights", provided that those measures are reasonable, necessary and proportionate.⁷² Specifically, the Tribunal stated that:

it would be reasonable for a coastal state to act to prevent: (i) violations of its laws adopted in conformity with the Convention; (ii) dangerous situations that can result in injuries to persons and damage to equipment and installations; (iii) negative environmental consequences ...; and (iv) delay or interruption in essential operations.⁷³

However, the Tribunal also emphasised that the coastal state must respect the freedom of navigation of the vessels of other states (including the right to allow civilian protest), unless it actually constitutes an interference with the exercise of the coastal state's sovereign rights.⁷⁴

Despite (or perhaps due to) the limitations of the UNCLOS framework with respect to maritime security, the need to address unlawful acts against the safety of maritime navigation and infrastructure was recognised in the 1988 *Convention for the Suppression of Unlawful Acts against the Safety of Navigation* (1988 SUA Convention) and its *Protocol for the Suppression of Unlawful Acts against the Safety of Fixed Platforms Located on the Continental Shelf* (1988 SUA Protocol).⁷⁵ Adopted following the 1985 hijacking of the Italian ocean liner *Achille Lauro*, the 1988 SUA Convention establishes a set of activities constituting criminal offences against maritime navigation, in relation to which states Parties agreed to exercise their jurisdiction to either prosecute or extradite offenders. The 1988 SUA Protocol, adopted together with the Convention, extends the application of these offences to "fixed platforms located on the continental shelf".

Offshore wind installations fall within Article 1(3) of the 1988 SUA Protocol, which defines a 'fixed platform' as an "artificial island, installation or structure permanently attached to the sea-bed for the purpose of exploration or exploitation of resources or for other economic purposes". The offences established by the 1988 SUA Protocol include:

- seizing or exercising control over a fixed platform by force or threat;
- acts of violence against a person on board a fixed platform;
- destroying a fixed platform, or causing damage likely to endanger its safety;
- placing a device or substance which is likely to destroy a fixed platform or endanger its safety; or
- injuring or killing any person in connection with such acts;⁷⁶ and
- attempting, abetting or threatening to commit such an offence.⁷⁷

Parties to the 1988 SUA Protocol are obliged to "take such measures as may be necessary" to establish jurisdiction over these offences when they are committed against or on board a fixed platform located on their continental shelf or by one of their nationals.⁷⁸

After the September 11 terrorist attacks on the United States, a review of the 1988 SUA Convention and Protocol resulted in the adoption of two more instruments: the *Protocol of 2005 to the Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation* (2005 SUA Protocol) and *Protocol of 2005 to the Protocol for the Suppression of Unlawful Acts against the Safety of Fixed Platforms Located on the Continental Shelf* (2005 SUA Fixed Platforms Protocol).⁷⁹ The 2005 SUA Fixed Platforms Protocol expands the list of offences against fixed platforms and increases the emphasis on maritime

terrorism (in particular, the intent to compel action by a population or government).⁸⁰ Importantly, however, neither the 1988 SUA Protocol nor the 2005 SUA Fixed Platforms Protocol accord any new *rights* to coastal states to address security threats to installations in areas beyond the territorial sea—rather, Parties to these agreements have accepted new *obligations* to exercise jurisdiction over alleged offenders in relation to any offences committed, within the existing jurisdictional framework established in UNCLOS (including the 500 metre safety zone).⁸¹

Figure 3. Ratification of relevant law of the sea conventions by Australia and ASEAN Maritime States

	1982 UNCLOS	1988 SUA Convention	1988 SUA Protocol	2005 SUA Protocol	2005 SUA Fixed Platforms Protocol	ASEAN Convention on Counter Terrorism
Australia	04/10/1994	20/05/1993	20/05/1993	07/03/2006*	07/03/2006*	X
Brunei	05/11/1996	03/03/2004	03/03/2004	X	X	14/06/2010
Cambodia	X	16/11/2006	16/11/2006	X	X	24/03/2010
Indonesia	28/09/2009	X	X	X	X	14/05/2012
Malaysia	14/10/1996	X	X	X	X	11/01/2013
Myanmar	21/05/1996	18/12/2003	18/12/2003	X	X	18/01/2012
Philippines	08/05/1984	05/04/2004	05/04/2004	X	X	24/03/2010
Singapore	17/11/1994	03/05/2004	10/11/2015	X	X	31/09/2007
Thailand	15/05/2011	X	X	X	X	21/02/2008
Timor-Leste	08/01/2013	X	X	X	X	X
Vietnam	25/07/1994	10/10/2002	10/10/2002	X	X	30/01/2011

* Australia signed the two 2005 Protocols on 7 March 2006 but has not yet ratified them.

Perhaps more importantly for the purposes of this article, there has been limited take-up of these treaties in Southeast Asia. As depicted in **Figure 3**, while Australia has ratified the 1988 SUA Convention and Protocol, and signed but not ratified the 2005 Protocols, not all ASEAN Members have chosen to ratify the 1988 SUA Protocol, and no ASEAN members have ratified the 2005 SUA Fixed Platforms Protocol. As Klein has noted, this may be due to a desire to address security concerns bilaterally or within the framework of ASEAN, such as through the 2007 *ASEAN Convention on Counter-Terrorism* (ACCT), which incorporates offences from all the multilateral counter-terrorism treaties (including the 1988 SUA Convention and Protocol and the 2005 Protocols).⁸² In the context of offshore wind however, the ACCT has limited relevance, since it only applies when the relevant offences are committed in the territory of a Party, by a national of a Party, or onboard a vessel or aircraft of a Party—there is no mention of offences committed in the maritime zones or against the offshore installations of a Party, and no powers of interdiction.⁸³ Looking beyond terrorism, the 2023 *ASEAN Maritime Outlook* identifies many of the issues that pose potential security threats to offshore wind

installations as areas for cooperation—including piracy and armed robbery at sea, illegal fishing, irregular movement of persons, and cyberattacks. However, no specific link is made between these issues and offshore renewable energy (which is separately identified as an area for cooperation).⁸⁴

SUBMARINE CABLES

Putting in place adequate legal (and practical) protections for offshore installations is not enough to secure the success of offshore wind farms: it is also necessary to safeguard the submarine cables which transport the electricity to shore. While international law has been considering issues relating to the protection of submarine cables for more than a century, the focus has primarily been on telecommunication cables—including through the adoption of the 1884 *Convention for the Protection of Submarine Telegraph Cables* (Cables Convention).⁸⁵ In modern law of the sea terminology, it is accepted that the term ‘submarine cables’ includes both telecommunications data and power cables, and that the term should be understood broadly in order to adapt to further developments in technology.⁸⁶ Regardless, the

focus of regulatory efforts has remained largely the same over time: like offshore installations, the legal framework established in UNCLOS for submarine cables centres less on prevention and protection, and more on the attribution of responsibility for damage; and jurisdiction is vested primarily in the flag state of the offending vessel, rather than in the relevant coastal state or cable owner.⁸⁷

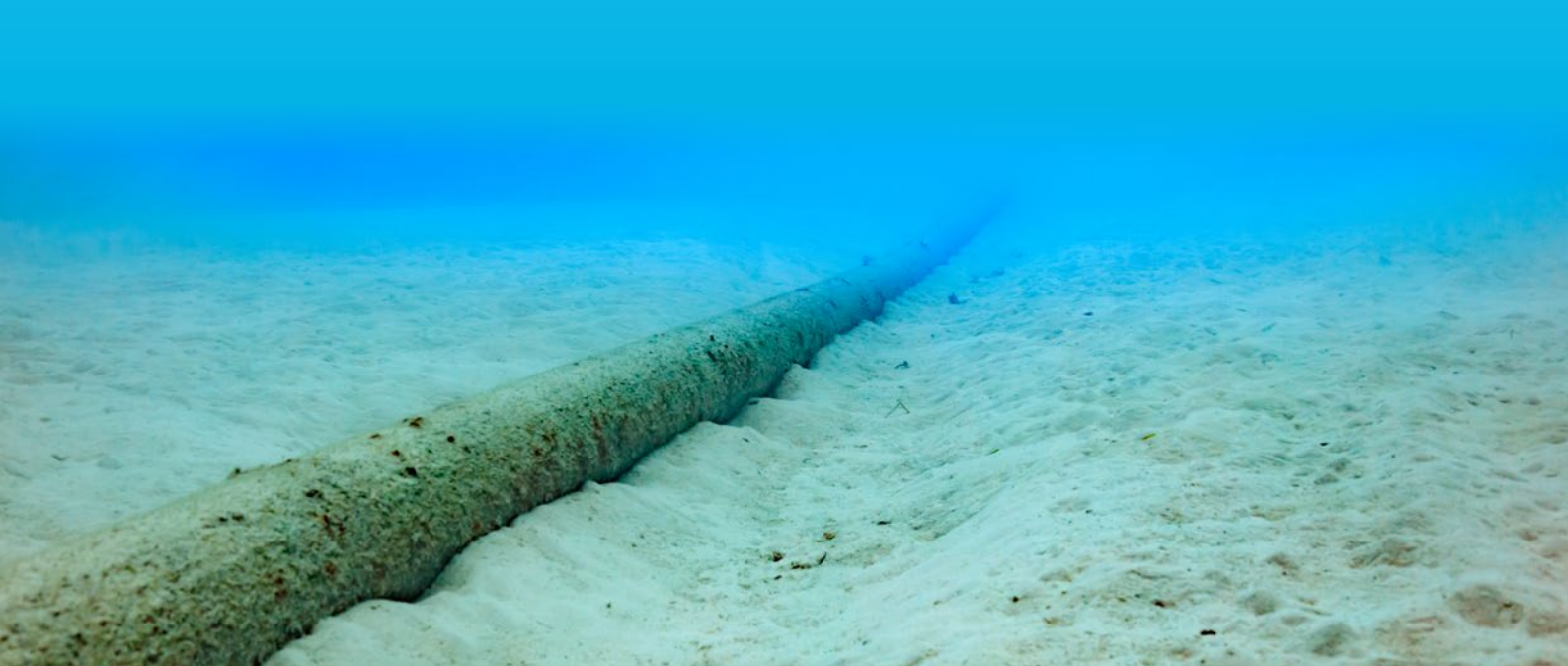
In areas under sovereignty, the situation is similar to that of offshore installations: coastal states can apply their laws and regulations to a vessel exercising innocent passage in order to protect submarine cables.⁸⁸ In practice, this would permit the establishment of a protection zone over such cables to a distance of 12 NM from the coast.⁸⁹ Moreover, any foreign ship which engages in “any act aimed at interfering with ... any other facilities or installations of the coastal State” is no longer exercising innocent passage and becomes subject to the enforcement jurisdiction of the latter.⁹⁰ But beyond 12 NM, the coastal state’s rights are much more limited. In the EEZ and on the continental shelf, all states—including coastal states—have the freedom to lay submarine cables, provided they exercise due regard for those already in position. However, the coastal state has the right to establish conditions for cables entering its territory or territorial sea (even if only passing through), and has ‘jurisdiction’ over submarine cables constructed or used in connection with the operations of installations and structures under its jurisdiction.⁹¹ Accordingly, in the context of offshore wind, the coastal state’s difficulty lies less in asserting the right to *make* laws for the protection of these cables, and more in how to *enforce* those laws in relation to foreign-flagged vessels.

The key provision in this respect is Article 113 of UNCLOS, which addresses damage to submarine cables in areas beyond 12 NM. Pursuant to Article 113, every state is required to adopt laws and regulations to punish the breaking or injury “by a ship flying its flag or a person subject to its jurisdiction of a submarine cable beneath the high seas done wilfully or through culpable negligence”, including conduct “calculated or likely to result in such breaking or injury”. This construction leaves some obvious gaps. First, it only applies in relation to *intentional* damage to submarine cables, and not to *accidental* damage (in relation to which there is no obligation). Second, although

Article 113 requires states to establish offences for these activities, it does not mandate the exercise of enforcement jurisdiction over offenders. And third, it only applies to the state’s own vessels and nationals, and does not attribute any prescriptive or enforcement jurisdiction to the coastal state. Accordingly, if a foreign-flagged vessel damages a submarine cable in the coastal state’s EEZ or continental shelf, enforcement action can only be taken by (or with the consent of) the vessel’s flag state, pursuant to the primary rule of exclusive flag state jurisdiction set out in Article 92 of the Convention.

This gap has led to the suggestion that a coastal state should be able to proclaim a safety zone around submarine cables, within which activities likely to cause damage to the cable—such as anchoring, fishing and dredging—could be prohibited.⁹² In the context of offshore wind, considering the inseparable relationship between offshore wind turbines and submarine power cables, it seems reasonable to propose that safety zones should be available as a regulatory tool for submarine power cables in the same way as they are for offshore installations, provided they can be tied to a legitimate basis of jurisdiction under the EEZ or continental shelf regime.⁹³ While some states have acted on this basis and established protection zones on either side of submarine cables,⁹⁴ others have not; and such zones are not specifically envisaged in the UNCLOS regime, which remains focused on flag state regulation and enforcement, as it has for the last hundred years.

In this respect, it is notable that the international concerns about the maritime security threats to vessels and platforms, which led to 1988 SUA Convention and its Protocols, did not extend to submarine cables, which are not included within the scope of those instruments. This appears to be changing: in recent years there has been a global resurgence of interest in the regulation of submarine cables,⁹⁵ reflected in this region by the 2024 establishment of an ASEAN Working Group on Submarine Cables. But even now, the focus is primarily on the traditional category of *telecommunications* cables, rather than *power* cables.⁹⁶ Given the growing importance of submarine power cables as a critical part of the offshore energy industry, this is something that should change.



WHAT DOES THIS MEAN FOR ASEAN AND AUSTRALIA?

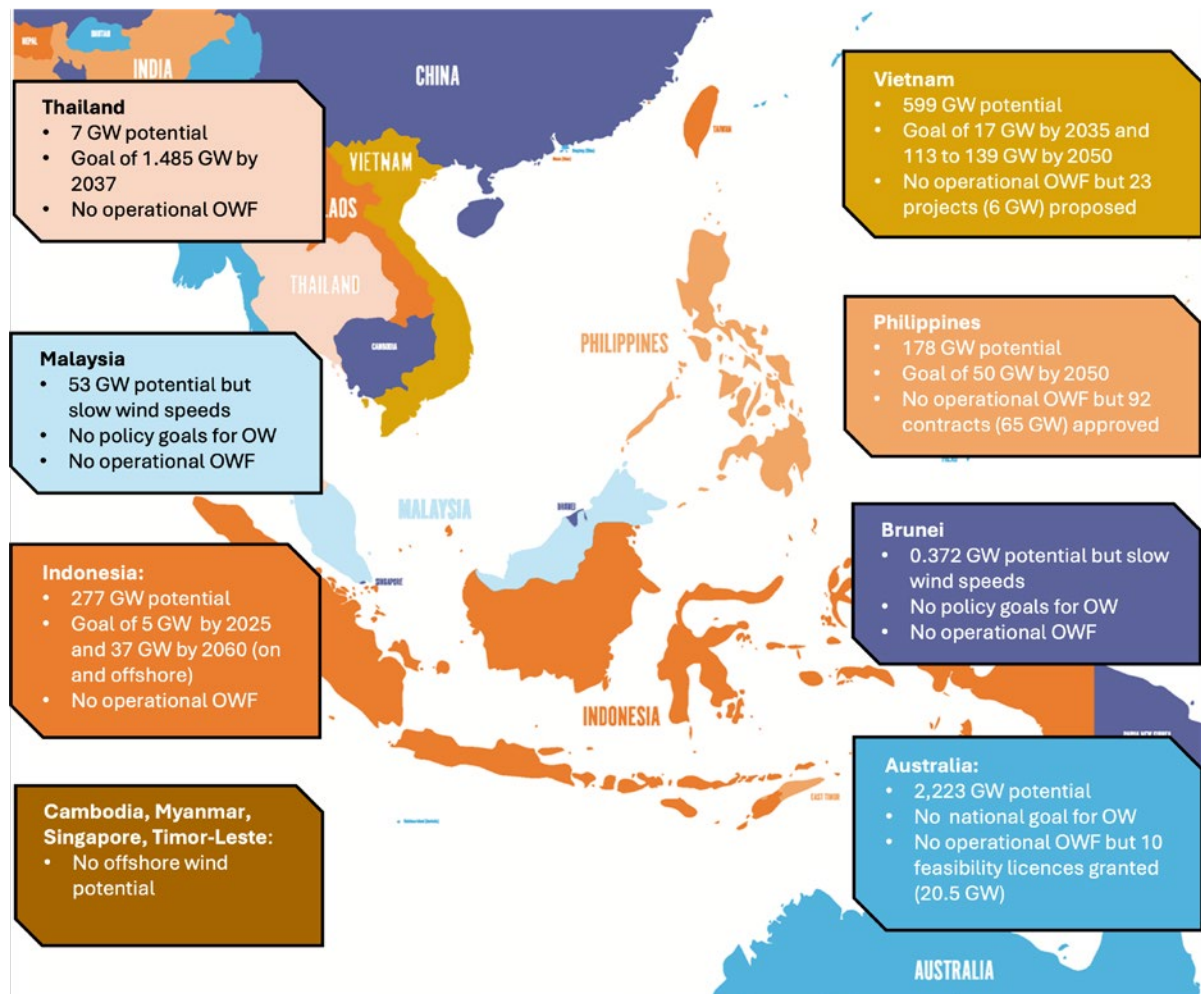
With over 50% of existing offshore wind infrastructure located in Chinese waters and significant developments under way in Taiwan, Japan and Korea,⁹⁷ Asia currently stands as the global centre of offshore wind development. Within this broader regional context, ASEAN countries are increasingly well-positioned to expand offshore wind capacity due to their long coastlines and vast maritime zones.⁹⁸ This potential is further supported by a strong economic outlook. The Levelized Cost of Energy (LCOE) for offshore wind is expected to decline by nearly 55% between 2018 and 2030, while production costs are projected to decrease by 37% to 49% by 2050.⁹⁹ These cost reductions are likely to make offshore wind increasingly competitive with fossil fuel-based electricity generation.¹⁰⁰ In light of these economic projections, regional frameworks have begun to reflect more ambitious renewable energy targets, and ASEAN members have collectively set a target of achieving 35% renewable energy in installed power capacity by 2025.¹⁰¹ As of the most recent data, the region has reached approximately 32%, indicating that this goal is within close reach.¹⁰² At present, however, offshore wind is the least developed renewable energy source in the Southeast Asian region, and as depicted in **Figure 4**, the technical potential, policy goals, and projects planned for development across the region vary significantly between countries.

Vietnam and the Philippines are emerging as clear front-runners, with ambitious targets and active policy support driving momentum. Indonesia, while not as advanced in policy or project terms, possesses substantial potential, making it a noteworthy candidate for future development. Beyond these three countries, the general level of interest in developing offshore wind energy across the region remains limited: while Brunei, Malaysia, and Thailand do have technical potential for offshore wind, they have yet to articulate clear policy goals or engage meaningfully in offshore wind development; and Cambodia, Myanmar, Singapore and Timor-Leste do not have viable offshore

wind resources.¹⁰³ Australia occupies a distinct position: although development remains in its early stages, its recent legislative progress and expanding project pipeline offer a useful benchmark for understanding what a more structured regulatory approach might entail.

While variation in national targets and project development is important, it is the underlying legal and regulatory frameworks that will ultimately determine whether offshore wind initiatives can move from planning to implementation—and what forms of protection will be in place when they do. This is the focus of **Figure 5**, which provides a comparative overview of the regulatory frameworks in Australia and the six ASEAN countries with the technical potential for offshore wind development. As this summary shows, there are significant variations in the regulatory frameworks in place for offshore wind in these countries, and in the measures that are available to ensure the safety and security of the platforms and power cables associated with offshore wind development.

With high prospective capacity and expanding offshore wind projects, Vietnam and the Philippines have begun to formalise regulatory frameworks focused on the administration and development of offshore wind projects, and Australia has established dedicated legislation focused on the installation and operation of offshore wind. However, Indonesia (with immense technical potential) and Brunei, Malaysia and Thailand (with more modest resources) have yet to establish a targeted legal framework specific to offshore wind. Beyond the question of dedicated offshore wind regulation, while most countries have existing legislation relating to artificial islands, installations, or platforms that could be applied to offshore wind infrastructure, this is generally directed at safety and accident protection rather than security and the potential for intentional damage. There are also limited protections in existing laws for submarine cables—and most of the existing protections apply only to *telecommunications* cables and not power cables. These

Figure 4. Offshore wind potential, policy and planned projects in Southeast Asia

general observations underscore the need to examine national contexts in greater depth. The following sections provide a country-specific analysis of the four countries with the most significant offshore wind potential and plans underway to support its development: Australia, Vietnam, the Philippines, and Indonesia. Each analysis considers the alignment between policy ambition and regulatory capacity to address the protection of offshore infrastructure and submarine power cables against maritime safety and security threats.

AUSTRALIA

Even though Australia's electricity requirements are forecast to more than double by 2050,¹⁰⁴ its offshore wind resource has the potential to exceed this demand by orders of magnitude: while the current National Electricity Market generates around 200 TWh of electricity annually,¹⁰⁵ the "technically accessible" portion of Australia's offshore wind resource is estimated at 2,223 TW, capable of generating 9,396 TWh of electricity per year.¹⁰⁶ At present, Australia does not have any specific policy goals for the development of this resource, or the role it will play in delivering these future energy requirements (although the state of Victoria has legislated

offshore wind targets of 2GW by 2032, 4GW by 2035 and 9 GW by 2040).¹⁰⁷ However, it is recognised that offshore wind will make a "significant contribution" to Australia achieving net zero by 2050, and that the areas authorized for the construction of offshore wind have "the potential to produce the renewable energy to support Australia becoming a renewable energy superpower".¹⁰⁸ This is reflected in the significant interest from the industry: 80 projects are proposed for Australian waters, although none are currently operating, or have yet progressed past the early feasibility phase of the project.¹⁰⁹

This is primarily because, until recently, Australia did not have legislation to facilitate the exploitation of offshore renewable energy resources. This changed in 2022 with the commencement of the *Offshore Electricity Infrastructure Act 2021* (Cth) (OEI Act), which provides a framework for the authorisation, construction and operation of offshore renewable electricity infrastructure in Commonwealth waters.¹¹⁰ Under the OEI Act, the Minister can declare specified areas as suitable for offshore infrastructure activities, and issue licences for the conduct of such activities. To date, the Australian Government has declared six offshore electricity infrastructure areas, in which some offshore wind developers have been



granted feasibility licences (the first step toward obtaining a commercial licence).¹¹¹ The OEI Act includes two measures specifically designed to protect offshore energy infrastructure and the people working on it—short-term ‘safety zones’ and permanent ‘protection zones’—and establishes offences for individuals and for the masters and owners of vessels which enter these zones.¹¹² However, the OEI Act offences are primarily directed at safety rather than security, and are expressed to have limited application to foreign vessels and nationals.¹¹³

In relation to the security of maritime infrastructure, the relevant legislation is the *Crimes (Ships and Fixed Platforms) Act 1992* (Cth) (CSFP Act), which creates offences relating to intentional damage to ‘fixed platforms’. Fixed platforms are defined in the CSFP Act to mean “an artificial island, installation or structure permanently attached to the seabed for the purpose of exploration for, or exploitation of, resources or for other economic purposes”.¹¹⁴ This would include offshore wind infrastructure. The CSFP Act sets out a range of activities that constitute offences against fixed platforms, including seizing control of a platform, destroying or damaging it, placing destructive devices on it, causing injury or death to a person in connection with an offence against a platform, and threatening to endanger a fixed platform.¹¹⁵

While the infrastructure protected by the CSFP Act does not extend to submarine cables, they are specifically addressed in Schedule 3A of the *Telecommunications Act 1997* (Cth), which provides for the creation of protection zones over submarine cables of “national significance” in Australian waters.¹¹⁶ Under the scheme established in Schedule 3A of the Act, protection zones can be established in relation to one submarine cable or multiple cables, covering an area 1,852 metres (or 1 NM) either side of the nominal location of the cable (or of the two outermost cables, if there are multiple cables), including the water column above and seabed and subsoil below.¹¹⁷ The activities which can be prohibited in a protection zone include (*inter alia*): the use of various forms of benthic fishing gear and methods; lowering, raising or suspending an anchor from a ship; and any activity involving a serious risk that an object will connect with the seabed, if it would be capable of damaging a submarine cable.¹¹⁸ In addition, the Act makes it an offence to damage a submarine cable either negligently or intentionally, with penalties of imprisonment for up to 3 years and 10 years, respectively (although these offences have limited application to foreign nationals and foreign ships in areas beyond 12 NM).¹¹⁹ However, it is not clear whether this legislation applies to submarine power cables. The term ‘submarine cable’ is defined in Section 2 of the Act to include both ‘domestic’ and ‘international’ submarine cables (depending on whether they link Australia to another country), but it

does not distinguish between telecommunications and power cables. While it thus appears that these provisions could be used to protect power cables, the legislation’s focus on telecommunications and the extrinsic material regarding its implementation suggest that it is applied only to telecommunications cables.¹²⁰

VIETNAM

With an estimated 599 GW of technical potential,¹²¹ Vietnam has the largest offshore wind resource in Southeast Asia. The significant economic and energy security opportunities of this resource are reflected in Vietnam’s updated *Power Development Plan 2021–2030 (PDP8)*, which targets an installed offshore wind capacity of 6GW by 2030, 17 GW by 2035 and between 113.5 and 139 GW by 2050.¹²² While there is no legislation in Vietnam pertaining specifically to offshore wind or offshore renewable energy, the momentum towards offshore wind is reflected in a range of legal and institutional reforms, and particularly in updates to the electricity regime. This regime is anchored by the *2024 Electricity Law*, which establishes the core administrative framework for the development and approval of offshore wind projects, which are categorised as either ‘nearshore’ or ‘offshore’ based on their location within or beyond six NM from the coastline.¹²³ The Electricity Law is supported by *Decree No. 58/2025*, which provides more detailed guidance on the implementation of large-scale offshore wind projects.¹²⁴ Notably, the Decree authorises the Ministry of Agriculture and Environment to oversee the review, selection, and allocation of sea areas for offshore wind deployment, with attention to efficient spatial use and environmental surveying.¹²⁵ However, Decree No. 58/2025 (and the broader electricity framework) focuses on energy generation and project approval processes; it does not extend to maritime safety or security, which fall under separate legal regimes.

The overarching legal framework for the protection of infrastructure in Vietnam’s waters is provided by the *2012 Law on the Vietnamese Sea*. Offshore installations are addressed in Article 34, which applies a 500-metre safety zone to all “artificial islands, structures and installations”, and establishes some general provisions relating to navigational safety.¹²⁶ For submarine cables, a general right of protection is outlined in Article 25(1)(c), which addresses the right to lay and the protection of submarine cables. A more detailed framework is elaborated in the *2015 Vietnam Maritime Code*.¹²⁷ In particular, Article 124 regulates the protection of marine structures—a term used in the Code to refer to offshore installations—to ensure safety against acts that may pose danger to human life or cause damage to state assets. The extent of protection also includes “underwater and underground parts”, which may

Figure 5. Comparative overview of regulatory frameworks for the protection of offshore wind infrastructure

Australia		
Offshore wind		The construction and operation of offshore infrastructure for the generation and transmission of energy from renewable sources (including offshore wind) is specifically regulated under the <i>Offshore Electricity Infrastructure Act 2021 Cth</i> (OEI Act).
Offshore Platforms	Safety	The OEI Act provides for the establishment of ‘safety zones’ and ‘protection zones’ around offshore renewable energy infrastructure, and establishes offences for unlawful entry (ss 136, 139, 142 and 148–50).
	Security	<i>The Crimes (Ships and Fixed Platforms) Act 1992</i> (Cth) includes offences relating to intentional damage to fixed platforms (ss 21–28).
Power Cables	Safety	Nil. The <i>Telecommunications Act 1997</i> (Cth) provides for the creation of protection zones over ‘submarine cables’ in Australian waters (ss 10–11) and establishes offences for engaging in prohibited activities or damaging a submarine cable in those zones (ss 36–41). However, this regime does not appear to extend to power cables.
	Security	Nil.
Brunei		
Offshore wind		No specific regulation for offshore wind or offshore renewable energy.
Offshore Platforms	Safety	The <i>Merchant Shipping Order 2002</i> provides for the designation of safety zones around artificial islands, installations and structures, and prohibits unauthorized entry by all vessels (s 132). This is implemented through the <i>Merchant Shipping (Safety Zones) Order 1988</i> which (as amended in 2013) provides that 500m safety zones are established around all “offshore installations” which are defined in relation to their role in oil, gas and mineral exploitation, but does not refer to wind or renewable energy (s 3).
	Security	The <i>Maritime Offences (Ships and Fixed Platforms) Order 2007</i> explicitly criminalises intentional damage to offshore platforms (ss 6 and 7).
Power Cables	Safety	Nil. The <i>Telecommunications Order 2001</i> only covers telecommunication cables on land (s 2). It does not address power cables or cables that are laid at sea.
	Security	
Indonesia		
Offshore wind		No specific regulation for offshore wind or offshore renewable energy.
Offshore Platforms	Safety	<i>Law No 32 of 2014 on Maritime Affairs (Law 32/2014)</i> (Art 32) and <i>Government Regulation No 6 of 2020 on Marine Buildings and Installations</i> (GR 6/2020) (Art 27) provide for safety zones to be established around offshore structures and installations. Similar provisions are established in <i>Government Regulation No 5 of 2010 on Navigational Matters</i> (GR 5/2010) and <i>Ministerial Regulation (PM) No. 129 of 2016 on Sea Lanes and Offshore Structures, as amended by Ministerial Regulation (PM) No. 40 of 2021</i>
	Security	Nil.
Power Cables	Safety	GR 6/2020 regulates the technical development of offshore electricity transmission infrastructure (including power cables) and includes measures related to the safety of navigation. Although it refers to a requirement to have regard to ‘corridors for laying submarine cables and pipelines’ (Art 4(4)), GR 6/2020 does not establish any protection zones or prohibit intentional damage to submarine cables. <i>Law No 36 of 1999 on Telecommunications</i> prohibits and criminalises actions which may cause interference with telecommunications operation but does not specifically refer to submarine cables or establish any protection zones—and it does not include power cables.
	Security	Nil.
Malaysia		
Offshore wind		No specific regulation for offshore wind or offshore renewable energy.
Offshore Platforms	Safety	The <i>Continental Shelf Act 1966</i> (CSA) provides that King may make regulations establishing a safety zone around offshore installations, regulating or prohibiting the entry of ships, and prescribing any other measures relevant to the safety zone (s 6). A similar power is provided in s21 of the <i>Exclusive Economic Zone Act 1984</i> . The <i>Merchant Shipping Ordinance 1952</i> (MSO) provides for the establishment regulations to ensure the safety of and control over ‘offshore industry structures’, including with respect to the ‘prevention of collisions’ (s485A), and criminalises intentional or negligent damage to structures (s114). However, these instruments do not <i>themselves</i> establish safety zones.
	Security	The MSO also contains powers for the protection of a ‘marine facility’ (which includes a fixed or floating offshore structure) in relation to a ‘security incident’ (which means any suspicious act or circumstance threatening its security) (s249A). This includes powers to direct a ship to a certain location (or to leave Malaysian waters) if there are reasonable grounds to suspect that it poses a security threat to a marine facility (s249S), prohibit ships from entering marine facilities if there is a security incident (s249T), and detain ships which fail to comply (s249V). The <i>Malaysian Maritime Enforcement Agency Act No 633 of 2004</i> establishes broad enforcement powers to prevent and suppress the commission of offences, enforce law and order and ‘perform any other duty for ensuring maritime safety and security’ (ss6 and 7).

Power Cables	Safety	The CSA provides that the King may make regulations prohibiting any activities that interfere with submarine cables, pipelines, or other essential uses of the continental shelf. The <i>Communications and Multimedia Act 1998</i> criminalises wilful or negligent damage to ‘network facilities’ (s235), including in areas ‘underwater’ and ‘at sea’ (s4), but is focused on telecommunications networks, and not power cables.
	Security	Nil.
Philippines		
Offshore wind		<i>Republic Act No. 9513 (Renewable Energy Act) 2008</i> is implemented through <i>Executive Order No 21, Directing the Establishment of the Policy and Administrative Framework for Offshore Wind Development</i> (Executive Order 21) and <i>Department of Energy Department Circular No 2023-06 (DOE-DC)</i> , which create a centralized permitting system under the Department of Energy and establishes a policy and administrative framework for the development of offshore wind. However, this framework does not directly address safety or security issues.
Offshore Platforms	Safety	There is no specific law ensuring the safety of offshore structures. <i>Republic Act No. 9993 (The Philippine Coast Guard Law) 2009</i> (PCG Law) and its <i>Implementing Rules and Regulation 2011</i> (IRR 2011) authorise the Philippine Coast Guard (PCG) to issue and enforce rules for the safety of life and property at sea and establish rules for navigational safety (which in theory could extend to the designation of safety zones around offshore structures). However, in practice, safety zones are established by project specific instruments, such as <i>Proclamation No 72 of 2001</i> , which applies solely to the Malampaya Deep Water Gas Project.
	Security	There is no specific law in relation to offences against the security of offshore structures. The PCG Law and IRR 2011 mandate the PCG to enforce regulations ‘in accordance with all relevant maritime international conventions, treaties or instruments’, and to arrest, investigate and file charges in relation to offences under <i>Republic Act No 3815 (Revised Penal Code)</i> and other ‘special laws’ (which could include the <i>Anti-Terrorism Act of 2020</i>).
Power Cables	Safety	The protection of offshore wind power cables is addressed within project-based environmental requirements through the <i>Department of Environment and Natural Resources Administrative Order No 2024-02 (DENR-AO)</i> , but no cable protection zones or offences are established.
	Security	Nil. The <i>Public Telecommunications Policy Act of 1995</i> applies only to telecommunications cables.
Thailand		
Offshore wind		No specific regulation for offshore wind or offshore renewable energy.
Offshore Platforms	Safety	Nil. The <i>Petroleum Act 1971</i> and the <i>Act on Offences relating to Petroleum Production 1987</i> (PPA) both include provisions on safety zones but apply only to petroleum installations.
	Security	Nil. Section 8 of the PPA links enforcement powers to relevant public security offences in ss 217, 226 and 231 of the <i>Thai Penal Code</i> , but only in relation to offshore petroleum installations.
Power Cables	Safety	The <i>Navigation Act 1913</i> effectively establishes cable protection zones by prohibiting anchoring, dredging or using fishing equipment within 100 meters of marked underwater cables (including ‘electric cables’) with accompanying offences (ss 209–211). The <i>Telecommunications Business Act 2001</i> criminalises intentional damage to submarine cables (s 44) but does not extend to submarine power cables and lacks provisions on protection zones or maritime enforcement.
	Security	
Vietnam		
Offshore wind		Offshore wind is regulated by <i>Law No. 61/2024/QH15 (Revised Electricity Law)</i> , which establishes the core administrative framework for offshore wind projects, implemented in more detail through <i>Decree No. 58/2025/ND-CP Detailing a number of articles of the Law on Electricity on renewable energy and new energy development</i> . However, this does not address safety or security issues.
Offshore Platforms	Safety	General provisions on safety are established in <i>Law No. 18/2012/QH13 (Law of the Vietnamese Sea) (2014 Law)</i> which applies a safety zone to all ‘artificial islands, installations and structures’ (Art 34) and <i>Law No. 95/2015/QH13 (Vietnam Maritime Code) (Maritime Code)</i> , which provides that measures for the protection of marine structures apply in these safety zones (Arts 124–126). <i>Vietnam Maritime Code Decree No. 58/2017/ND-CP on Guidelines for some articles of the Vietnam Maritime Code on Management of Marine Operations</i> (Maritime Code) also provides guidance on navigational safety, particularly in the context of construction of offshore infrastructure (Arts 8 and 39).
	Security	The Maritime Code prohibits the destruction, damage, or theft of components from marine construction works (Art 129), and distinguishes marine accidents from deliberate harm which would fall under <i>Law No. 100/2015/QH13 (Criminal Code of Vietnam) (Art 123)</i> . The Criminal Code contains a number of potentially relevant offences including deliberate destruction or damage of property, destruction of works important to national security, and ideologically motivated sabotage (Arts 178, 303 and 114, respectively).
Power Cables	Safety	Nil. <i>Law No. 24/2023/QH15 (Law on Telecommunications)</i> applies only to submarine telecommunications cables and does not specifically establish any protective measures. Submarine power cables do potentially fall within the meaning of ‘marine structures’ for which protections could be established under the Maritime Code (Arts 124 and 126).
	Security	Nil.

Source: Jung, Sabatira and Goodman, 2025.



reasonably be interpreted to cover submarine cables.¹²⁸

The Maritime Code does not specify a single fixed distance for safety zones. Instead, Article 126(b) provides that the extent of protection for “offshore oil ports” is restricted to the safety zones where navigation and anchoring are prohibited, and Article 126(dd) makes the protection of “aerial and underground” components subject to case by case determination on the basis of technical standards and other legal instruments. *Decree No. 58/2017* also provides some guidance for large-scale offshore wind development.¹²⁹ For example, Article 39(3) requires that any organisation or individual undertaking construction likely to affect maritime operations—including wind power works and submarine cables—establish appropriate aids to navigation to ensure navigational safety. Article 8 further mandates that prior to undertaking such construction, developers must submit a Maritime Safety Assurance (MSA) plan that incorporates a marine traffic monitoring system to uphold maritime safety.

While most of these measures are primarily targeted at operational safety and accidental damage rather than maritime security or enforcement powers against intentional threats,¹³⁰ the Maritime Code does criminalise intentional damage to installations. Notably, Article 127 outlines emergency response obligations for the protection of marine structures, requiring prompt threat reporting, immediate intervention by port authorities, mitigation and compliance by project owners, and coordinated support from local authorities. This both operationalises the safety zone provisions in Article 126 and facilitates escalation to criminal penalties under the *2015 Criminal Code of Vietnam* in cases of serious violations.¹³¹

Article 12(9) prohibits the destruction, damage, or theft of components from marine construction works, and Article 123 distinguishes marine accidents from deliberate harm, which would fall under the Criminal Code. The Criminal Code includes provisions such as Article 178 for deliberate destruction or damage of property, and Article 303 on destruction of works important to national security, which are subject to imprisonment if the infrastructure is deemed of national security, economic, technological, or social importance. Other provisions of potential relevance to offshore wind infrastructure include Article 289 on illegal infiltration into computer systems, applicable to cyberattacks, and Article 114 on ideologically motivated sabotage.

There is no dedicated law in Vietnam governing the protection of submarine cables—particularly power cables. In this respect, the *2023 Law on Telecommunications* provides only baseline protection: Article 5(3) prohibits harmful interference with telecommunications infrastructure; Article 8 provides that national telecommunications development planning shall “ensure the safety of telecommunications infrastructure”, and Article 38 sets out licensing and compliance requirements relating to legal, environmental, and national security standards.¹³² That said, the law only refers to “submarine telecommunications cables” and makes no mention of power cables. In the absence of a specific legal framework, preventive and enforcement measures against accidental or intentional damage to submarine cables would require reliance on the provisions for damage to marine structures under the Maritime Code and associated regulations, and general criminal offences under the Criminal Code.



THE PHILIPPINES

With over 7,000 islands encompassed in waters with an estimated technical potential of 178 GW of offshore wind, both the terrestrial and maritime geography of the Philippines are well-suited to offshore wind development.¹³³ This has been recognised by the Philippines Government, which has begun to formally incorporate offshore wind development into its national energy planning frameworks. Under the *National Renewable Energy Program* (NREP), the government has set progressive renewable energy targets—35% by 2030, 50% by 2040, and over 50% by 2050.¹³⁴ These targets are further articulated in the *Philippine Energy Plan* (PEP) 2023–2050, which outlines two deployment pathways: Clean Energy Scenario (CES) 1, projecting 19 GW of offshore wind capacity by 2050, and CES 2, which sets a more ambitious target of 50 GW over the same period.¹³⁵

To support the implementation of the PEP, the Government has introduced a suite of administrative and regulatory instruments under the overall framework of the *Renewable Energy Act 2008*,¹³⁶ including *Executive Order No. 21*,¹³⁷ which mandates the creation of a centralised permitting system under the Department of Energy. This has been implemented through a Department of Energy Department Circular (DOE-DC),¹³⁸ which standardises processes for service contracting, project registration, and inter-agency coordination, while emphasizing streamlined development procedures. Complementary provisions are found in a Department of Environment and Natural Resources Administrative Order (DENR-AO),¹³⁹ which primarily addresses administrative and environmental

processes. However, neither of these instruments provide enforceable maritime safety or security regulations. For example, while Section 3 of the DENR-AO requires contingency planning for navigational risks and marine hazards during both the construction and operational phases, these measures operate primarily as developer obligations rather than enforceable statutory safety mandates. Similarly, Section 15 of the DOE-DC requires coordination with relevant agencies to ensure the safety and security of offshore wind projects, but does not define any particular safety zones or enforcement powers, essentially creating responsibility without establishing any dedicated enforcement mechanism or penal provisions specific to offshore wind infrastructure.¹⁴⁰

Ensuring the safety and security of offshore infrastructure falls within the institutional responsibility of the Philippine Coast Guard (PCG), whose powers are established by the *2009 Philippine Coast Guard Law* (PCG Law)¹⁴¹ and its *2011 Implementing Rules and Regulations* (IRR).¹⁴² The PCG has a broad mandate to enforce regulations for the promotion of safety and security at sea.¹⁴³ These are elaborated in more detail in the IRR, which specifically authorizes the PCG to “issue and enforce rules and regulations for the promotion of safety of life and property at sea on all maritime-related activities”,¹⁴⁴ to enforce “all pertinent rules and regulations on all vessels, ships, watercrafts, and offshore facilities or platforms or oil rigs”,¹⁴⁵ and to “assist in the enforcement and maintenance of maritime security, prevention or suppression of terrorism at sea, and performance of law enforcement functions in accordance with pertinent laws, rules and regulations”.¹⁴⁶ Notably, there is no reference to safety zones in the laws and rules

establishing the PCG's powers. Rather, formal safety zones are established by project-specific instruments, such as *Proclamation No 72 of 2001*, which only applies to the Malampaya Deep Water Gas Project, and in which administration and enforcement is delegated to the leadership of the Department of Energy and Department of National Defence.¹⁴⁷ However, under Rule 3(e) of the IRR, the PCG is empowered to establish maritime rules for navigational safety, including traffic separation schemes, "safe passage, anchorage zones", and related controls—which suggests that *de facto* safety zones may be designated under PCG's general powers, even if not codified as formal exclusion zones.

To date, the Philippines has not taken the approach of setting out detailed provisions (or establishing specific offences) on the safety or security of offshore infrastructure in domestic law, but instead authorises the enforcement of laws "in accordance with applicable international instruments". For example, under Rule 3(a) of both the PCG Law and the IRR, the PCG is mandated to enforce regulations "in accordance with all relevant maritime international conventions, treaties or instruments". While the PCG is authorised to arrest, investigate, and file charges in relation to offences under the *Revised Penal Code*¹⁴⁸ and other unspecified 'special laws' (which might include, for example, the *Anti-Terrorism Act of 2020*)¹⁴⁹ at present there is no express criminal offence of threat or damage to, or interference with, offshore infrastructure. This reliance on general references to other instruments creates a paradox: while aligning

with global norms and maximising flexibility, it leaves critical operational details undefined, which may limit the effectiveness and scope of national maritime protection and leave unintended gaps.

Similarly, there is no dedicated law for the protection of submarine power cables in the Philippines. The *Public Telecommunications Policy Act of 1995* applies only to telecommunications cables and does not extend to power transmission cables.¹⁵⁰ In the offshore wind framework, submarine cables are referenced only as ancillary infrastructure within offshore wind projects and are not subject to dedicated security protocols. However, safety oversight is embedded within project-based environmental requirements. For example, the DENR-AO classifies buried inter-array and export cables as key components of offshore wind development, subjecting them to environmental impact assessments, baseline mapping, and area clearance procedures.¹⁵¹ Offshore wind developers are required to coordinate with specific agencies to avoid navigational hazards and minimise overlap with ecologically or socially sensitive zones.¹⁵² While these procedures imply spatial controls, no formal cable protection zones are established. During cable-laying and operation, the PCG may also regulate navigational safety under the PCG Law and its IRR (Rule 3(e)), but this authority is not specific to submarine cables. However, to the extent such cables may be considered 'property at sea', the PCG may be able to exercise jurisdiction based on its authority to arrest, investigate, and file charges in relation to violations of the Revised Penal Code and 'special laws'.¹⁵³



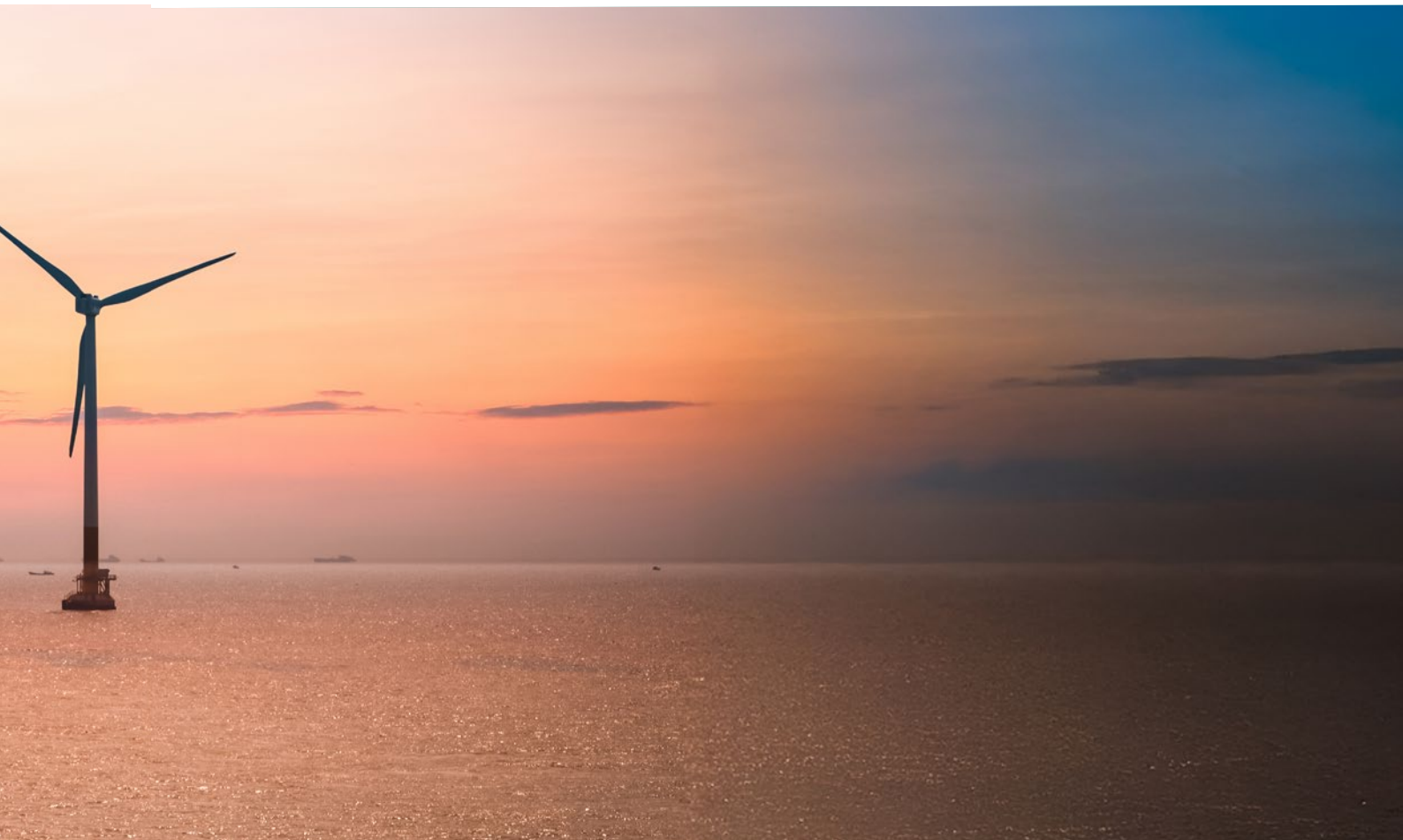
INDONESIA

The Ministry of Energy and Mineral Resources (MEMR) estimates that Indonesia possesses 94.2 GW of offshore wind potential.¹⁵⁴ At the national policy level, offshore wind is not addressed separately but remains part of broader renewable energy targets—and in particular, part of a combined target of onshore and offshore wind. In this respect, wind energy is listed as third priority in the renewable energy roadmap, which projects a contribution of 37 GW by 2060.¹⁵⁵ Compared to Vietnam and the Philippines, Indonesia's target remains modest. Critically, Indonesia does not yet have specific legislation in place to govern offshore wind farm development. At present, the closest regulatory reference point lies in the broader framework governing offshore infrastructure.

With respect to the safety of offshore installations, *Law No. 32 of 2014* provides generally for the establishment of safety zones around offshore structures,¹⁵⁶ and a more specific 500-metre prohibited zone is defined in its implementing regulation, *Government Regulation No. 6 of 2020* (GR 6/2020).¹⁵⁷ With respect to the security of offshore infrastructure, Indonesia's regulatory framework is generally limited to monitoring functions, as outlined in Article 61 of *Law No. 32 of 2014*, which provides for the conduct of patrols and ship inspections for enforcement purposes.¹⁵⁸ Notably, Indonesian legal instruments tend to merge the concepts of safety and security within consolidated provisions.¹⁵⁹ These are, however, primarily framed around navigational safety and aimed at preventing vessel collisions with offshore infrastructure, rather

than addressing intentional harm or security threats. They do not establish security measures or offences in relation to physical attacks on infrastructure and remain administrative and preventive in nature, lacking provisions for enforcement or punitive action.

In terms of submarine cables, the regulatory framework is more fragmented. Notably, however, it includes some provisions specific to submarine power cables. Specifically, Article 21 of GR 6/2020 regulates the technical development and safety of offshore electricity transmission infrastructure,¹⁶⁰ while Article 22(7) stipulates that such infrastructure must not interfere with archipelagic sea lanes or international shipping routes and must ensure vertical clearance to protect both maritime navigation and aviation safety. However, it does not establish any protection zones or prohibit intentional damage to submarine cables by either domestic or foreign-flagged vessels. *Law No. 36 of 1999 on Telecommunications* provides a more explicit framework for the protection of telecommunication equipment, which does not specifically refer to (but could include) submarine telecommunication cables. Article 38 prohibits activities that may interfere with telecommunications operations, while Article 55 criminalizes both accidental and intentional damage. However, this framework applies strictly to telecommunication cables and does not extend to power cables.



POWERING AHEAD: WHAT NOW, WHAT NEXT?

From a maritime safety perspective, the Asia-Pacific region faces acute operational and environmental hazards. It is the most hazard-prone region in the world due primarily to the high incidence of typhoons, cyclones, and earthquakes, which pose risks of structural damage and service disruption.¹⁶¹ Compounding this are navigational hazards, such as abandoned rigs, dense traffic, fishing gear, and anchoring activities, all of which pose dangers to offshore platforms and submarine cables.¹⁶² From a maritime security perspective, it is well established that the Southeast Asian region remains a hotspot for maritime crime. In 2024, Southeast Asia accounted for over half of global piracy and armed robbery incidents, with 43 cases in the Singapore Straits and 22 in Indonesian waters, out of 116 incidents reported worldwide.¹⁶³ While offshore wind farms are not yet operational in the region, offshore oil platforms offer a relevant point of reference. In Southeast Asia, these platforms are often located in underdeveloped or politically volatile maritime zones, including areas vulnerable to inter-state tensions or subject to limited enforcement capacity.¹⁶⁴ Risks include hijacking, armed robbery, protest actions by affected communities, and demands for compensation or profit-sharing.¹⁶⁵ The threat of intentional damage to submarine cables also poses significant risks for offshore wind in Southeast Asia, both in terms of ensuring domestic energy security and in relation to the export of electricity between countries. Ongoing grey-zone tensions in the South China Sea further elevate the risk of unlawful interference and state-linked disruptions.¹⁶⁶

While energy policy and planning documents increasingly recognise the strategic and economic value of offshore wind, there is little evidence that Southeast Asian states, individually or collectively, have yet considered the maritime security threats that will be posed to this new form of critical maritime infrastructure in crowded and contested seas, or the regulation that may be required to address them.¹⁶⁷ At present, the protection of offshore

wind infrastructure in most ASEAN countries would rely on general maritime, petroleum, or telecommunications laws. While these instruments address navigational safety and, in some cases, establish restricted zones around offshore installations, they are largely administrative or enabling in nature, and lack clear mechanisms to address deliberate or cross-border security threats. In the case of submarine cables, regulatory frameworks remain predominantly focused on telecommunication cables, with power transmission infrastructure often omitted or, at best, ambiguously addressed.

While Australia, Vietnam and the Philippines have enacted legislation to support the development of the offshore wind industry, these frameworks do not maximise the legislative opportunities available to protect offshore wind infrastructure from maritime security threats. Australia's OEI Act, coupled with the CSFP Act, provides a relatively advanced framework, establishing protection zones and enforcement measures applicable to offshore infrastructure—but the application of these measures to foreign-flagged vessels (and the protection of submarine power cables) is not as robust as it might be. More work is also required in Vietnam and the Philippines, whose sector-specific frameworks focus primarily on permitting and administrative coordination, and do little to address maritime security threats or enable the protection of submarine power cables. While Indonesia stands out as having high potential for offshore wind, it has not yet implemented any legislation designed to protect offshore wind infrastructure; at present, any such developments would be protected only through general safety provisions focused on navigation. The regulatory framework in the other Southeast Asian countries with offshore wind potential—Brunei, Malaysia and Thailand—is similarly mixed: while none have specific laws for offshore wind, they each have existing legislation which would provide some protection for offshore wind infrastructure. However, this legislation primarily relates to the establishment

of safety zones around oil and gas platforms and the protection of telecommunications cables, and is not focused on *renewable energy* installations, offences for *intentional* damage, or protection for *power* cables.¹⁶⁸

Against this backdrop, it is important to consider what steps ASEAN countries and Australia could take now—in advance of the development of offshore windfarms—to enhance regulatory protections available for offshore wind infrastructure, and to ensure both energy security and maritime security.

While the international legal framework places some clear limits on the measures that coastal states may take to protect offshore platforms and cables in their maritime zones, the first step for coastal states is to consider whether they have maximised their opportunities to regulate under the existing law of the sea. Obviously, this includes consideration of measures applying to both platforms and cables in relation to both safety and security threats—but it could also include consideration of broader planning and policy issues related to the location and layout of windfarms. For example, different regulations may be warranted in different maritime zones, in order to make the best use of the additional powers available to coastal States to protect their platforms and cables in the territorial sea and archipelagic waters. In addition, early consideration of spatial planning issues—including the layout of windfarms and the routes of power cables—may facilitate more strategic deployment of the protection measures that are available to coastal states, such as safety zones, traffic routing systems, and cable protection zones.

EXPANDING THE PROTECTION OF OFFSHORE PLATFORMS

While most states have legislative frameworks providing for the establishment of safety zones around offshore platforms, it is necessary to take the steps to *actually establish* them in law—and to ensure they apply not only to oil and gas, but to offshore wind infrastructure. This will present new planning and policy challenges: while establishing safety zones extending 500 metres from the edge of an offshore oil or gas platform is one thing, doing so in the context of large offshore wind farms containing tens or possibly hundreds of individual turbines (as well as sub-stations) raises different issues, requiring different solutions. For example, will safety zones simply be declared around the whole wind farm, and vessels required to navigate around?¹⁶⁹ Will specific categories of vessels be allowed to navigate through wind farms under certain conditions,¹⁷⁰ or traffic separation schemes or shipping channels be established?¹⁷¹ Or will the turbines be located sufficiently far apart for safety zones to be established around each one—and if so, will they be the maximum 500 metres allowed under UNCLOS, or will they be less?¹⁷² Bearing in mind the navigational incidents that have taken place in windfarms, coastal states may wish to consider how to overcome some of the challenges associated with the 500 metre limit. For example, beyond simply regulating vessels by prohibiting entry to safety zones, wind farm operators could be required to have real-time monitoring in place throughout and beyond the wind farm, with

protocols and early warning systems to enable intervention (particularly in the case of navigational incidents).

Beyond the basic safety protections afforded under UNCLOS, countries should seriously consider establishing criminal offences relating to intentional damage to offshore wind infrastructure. This is facilitated under the 1988 SUA Protocol and the 2005 SUA Fixed Platforms Protocol, which require Parties to criminalise a broad range of acts against offshore platforms, including various forms of maritime terrorism. While several Southeast Asian countries have not yet ratified the 1988 SUA Protocol, and none (including Australia) have ratified the 2005 SUA Fixed Platforms Protocol, membership of these conventions is not a pre-requisite to taking domestic action; these offences relate to issues over which all coastal states have jurisdiction under existing international law. Noting the limited extent to which ASEAN countries have criminalised intentional damage to fixed platforms, and particularly offshore wind structures, addressing this gap should be a priority for the region.

EXTENDING PROTECTION TO SUBMARINE POWER CABLES

Another key priority for domestic regulation is the protection of submarine power cables. As demonstrated in Figure 5, most countries in the region regulate submarine cables under telecommunications laws which only apply to telecommunications cables, and do not prohibit or criminalise damage to power cables. However, power cables—particularly export cables—should be understood to constitute critical maritime infrastructure in a similar way to telecommunication cables, and to require at least equal protection. Given their size and weight, they are probably more difficult to damage than telecommunication cables, but they are also significantly more costly to repair.¹⁷³ Power cables associated with offshore wind are also more likely to attract coastal state jurisdiction, particularly since most will enter the territorial sea and territory of the coastal state. Considering the importance of securing the transmission of electricity to the land, coastal states should adopt domestic legislation that protects all forms of submarine cables—or to use Australia’s formulation, all submarine cables of “national significance”.

At a minimum, this legislation should fulfil the UNCLOS requirement to criminalise the wilful or negligent breaking or injury of a submarine cable in the EEZ or on the high seas.¹⁷⁴ But beyond this, consideration should also be given to going further and maximising the jurisdiction that is available with respect to cables in or entering the coastal state’s territory, territorial sea or archipelagic waters,¹⁷⁵ or associated with the operation of its offshore installations.¹⁷⁶ In this respect, one option is to establish submarine cable protection zones within which certain activities (such as anchoring, fishing and dredging) are restricted or prohibited. Once again, bearing in mind the range of potential maritime security threats and their consequences, legislation establishing protection zones should go beyond merely prohibiting or restricting activities, and establish criminal offences for intentional damage to submarine power cables.

ENHANCING REGIONAL COLLABORATION

Of course, domestic regulation is not the only—or even necessarily the best—way to tackle maritime security threats and protect offshore wind developments. In this respect, ASEAN members have noted the importance of coordinated and strategic actions to achieving energy security, sustainability, and resilience in support of a low-carbon future,¹⁷⁷ and a number of relevant initiatives are already underway. This is also a rich area for deepening Australia-ASEAN maritime cooperation, given the common interests of Australia and ASEAN in the security of maritime trade and the resilience of maritime infrastructure, and the long-standing commitment to maritime security.¹⁷⁸ Offshore wind crosses all of the themes explored in the 2024 Australia-ASEAN Maritime Forum—maritime security, the blue economy, marine environmental issues and climate change, and maritime law and governance—and is subject to a range of threats on which Australia and ASEAN countries already cooperate, including illegal fishing, piracy and armed robbery at sea, and marine disasters.

One important opportunity for collaboration is the ASEAN Offshore Wind Development Roadmap, launched in 2024,¹⁷⁹ which reportedly emphasises the need to strengthen “regional cooperation between and amongst governments, enterprises, and research institutes to foster a collaborative innovation system for wind power development in ASEAN”.¹⁸⁰ While this Roadmap is not yet publicly available, it is already clear that the collaboration which it seeks to foster must extend beyond the ‘development’ of offshore wind farms and address the broader maritime security threats to their ongoing operation. Given the unique maritime geography, varied security challenges, and potential significance of offshore wind in this region, ASEAN could play an important role in developing regional responses to emerging safety and security issues relation to offshore wind. This sort of regional collaboration would help to harmonise legal frameworks and enforcement mechanisms for the protection of offshore wind farms, completing and complementing gaps and ambiguities in international law.

Another important opportunity to enhance regional collaboration in relation to offshore wind infrastructure is the ASEAN Working Group on Submarine Cables. To date, this Working Group has focused implicitly (if not explicitly) on telecommunication cables—including through the development of the *Asean Guidelines for Strengthening*

Resilience and Repair of Submarine Cables. But given the growing importance of exporting (or importing) electricity via submarine cable, any regional collaboration on this issue should be expanded to include power cables. This is particularly relevant in light of the plans to export electricity via submarine cable—not only the proposal to export power from Vietnam to Malaysia and Singapore, but the Australia-Asia Power Link (AAPowerLink) project, which plans to transmit electricity from northern Australia through Indonesian waters to Singapore via 4,300km of submarine cables.¹⁸¹ Without effective collaboration between interested states to ensure that meaningful protections are put in place, transboundary submarine power cables of this sort, which traverse maritime zones under the jurisdiction of multiple countries, are even more vulnerable to damage than submarine cables within the maritime zone of a single coastal State; and as demonstrated by the *Estlink 2 incident*, the repairs can be both lengthy and costly.

In addition, given the transnational nature of many (if not most) modern maritime security threats, joint surveillance and intelligence sharing have become increasingly important.¹⁸² As the offshore wind industry develops in this region, there will be a growing need to monitor and analyse security threats to offshore wind infrastructure—from piracy, armed robbery and maritime terrorism to contraband smuggling and illegal fishing—and to collaborate through regional law enforcement mechanisms to address them. As Bueger points out, Southeast Asia is well-equipped with regional maritime security architecture that can contribute to these efforts: from the Information Fusion Centre in Singapore, which can contribute to collecting and sharing information, to the ASEAN Coast Guard Forum and the ASEAN Defence Ministers’ Meeting, which can discuss the development of regional approaches, joint standards and best practices.¹⁸³ Once again, it will be important to ensure that the scope and focus of these institutions are appropriately adapted to address the threats to offshore wind. For example, while the reporting categories used by the IFC include ‘maritime terrorism’ involving vessels or fixed platforms at sea, they do not include intentional damage to submarine power cables.¹⁸⁴

CONCLUSION

Offshore wind will play an important role in the global transition to renewable energy. But this 'blue energy future' will present new and different maritime security risks, which will require the reconsideration—and recalibration—of the legal frameworks that have traditionally been used to regulate offshore industries. While this is a challenge, it is perhaps better seen as an opportunity—particularly for Southeast Asia and Australia, who have sizeable offshore wind resources their waters, and are well placed to develop their own strategies for effective protection of the infrastructure and submarine cables that will be needed to exploit them, separately and together.

**THIS 'BLUE
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RISKS**

ENDNOTES

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- 19 *Ibid.*, 77.
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- 33 Bueger and Edmunds, "Maritime Security and the Wind", note 30, 441–443; D. Moulas, M. Shafiee and A. Mehmanparast, "Damage Analysis of Ship Collisions with Offshore Wind Turbine Foundations", *Ocean Engineering* 147 (2017): 149.
- 34 See further: Andrew Rawson and Mario Brito, "Assessing the validity of navigation risk assessments: A study of offshore wind farms in the UK", *Ocean and Coastal Management* 219 (2022), 106078.
- 35 Adrijana Buljan, "Cargo Ship-Hit Gode Wind 1 Turbine Went Back Into Service in 24 Hours; Vessel Said to Have Been Kilometres off Course", *OffshoreWIND.biz*, 30 May 2023, available at <https://www.offshorewind.biz/2023/05/30/cargo-ship-hit-gode-wind-turbine-went-back-into-service-in-24-hours-vessel-said-to-have-been-kilometres-off-course/>.
- 36 "Fishing vessel failed to keep proper lookout", *renews.biz*, 2 May 2025, available at <https://renews.biz/100347/fishing-vessel-failed-to-keep-proper-lookout/>.
- 37 Adnan Durakovic, "Vattenfall Shows Damage Caused by Cargo Ship Adrift at Hollandse Kust Zuid Offshore Wind Farm", *OffshoreWIND.biz*, 2 February 2022, available at <https://www.offshorewind.biz/2022/02/02/vattenfall-shows-damage-caused-by-cargo-ship-adrift-at-hollandse-kust-zuid-offshore-wind-farm/>.
- 38 E. Gulski et al., "Discussion of Electrical and Thermal Aspects of Offshore Wind Farms' Power Cables Reliability", *Renewable and Sustainable Energy Reviews* 151 (2021), 111580: 2. This figure includes both faults in the open sea (such as dragging fishing gear, anchor strikes or erosion) and faults resulting from deficiencies in installation.
- 39 International Cable Protection Committee, "Damage to Submarine Cables from Dragged Anchors", 24 February 2025, available at <https://www.iscpc.org/publications/icpc-viewpoints/damage-to-submarine-cables-from-dragged-anchors/>. This figure includes both telecommunications and power cables. Repair costs (per incident) are in the region of USD 0.7 to 1.4 million for telecommunication cables, and USD 13 to 135 million for power cables.
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- 50 Andrzej Smacki et al., “Cybersecurity of autonomous ships in offshore wind farms”, *Procedia Computer Science* 246 (2024), 5525.
- 51 Knack et al., note 49, 11.
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- 54 Ionut Arghire, “German Wind Turbine Firm Hit by Targeted, Professional Cyberattack”, *Security Week* (26 April 2022), <https://www.securityweek.com/german-wind-turbine-firm-discloses-targeted-professional-cyberattack/>.
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- 56 Ibid., 446.
- 57 See, e.g., Adrijana Buljan, “North Sea, Baltic Sea Countries Enter Pacts to Protect Offshore Energy Infrastructure Amid Concerns over Russian Sabotage”, *offshoreWIND.biz*, 11 April 2024, available at <https://www.offshorewind.biz/2024/04/11/north-sea-baltic-sea-countries-enter-pacts-to-protect-offshore-energy-infrastructure-amid-concerns-over-russian-sabotage/>.
- 58 *The Arctic Sunrise Arbitration (The Netherlands v. The Russian Federation)*, Award on The Merits of 14 August 2015, PCA Case No. 2014-02 (*Arctic Sunrise Arbitration*).
- 59 *United Nations Convention on the Law of the Sea*, opened for signature 10 December 1982, entered into force 16 November 1994, 1833 UNTS 3 (UNCLOS). See Figure 3. Many aspects of UNCLOS also apply to non-Parties as a matter of customary international law.
- 60 UNCLOS, Articles 2, 3 and 49. The territorial sea extends 12 nautical miles (NM) seaward of the coastal states’ baselines, while archipelagic waters are those areas enclosed by archipelagic baselines drawn around the outermost islands and reefs of an archipelago, under the conditions established in Article 47.
- 61 Ibid., Articles 57 and 76. The EEZ extends seaward from the 12 NM limit of the territorial sea to an outer limit of 200 NM. The continental shelf comprises the seabed and subsoil beneath the EEZ to 200 NM and can extend further under the conditions described in Article 76. While offshore wind could also be used to generate power in areas beyond national jurisdiction, that is not considered in this article. See, e.g., Makoto Seta, “Environmental Impact Assessment of Offshore Windfarms in Areas beyond National Jurisdiction: Who Should Have Obligations?”, *Australian Yearbook of International Law* 41, no. 1 (2023): 74.
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- 63 UNCLOS, Article 19(k).
- 64 Ibid., Articles 21(b), 25 and 52(2).
- 65 Ibid., Articles 19(2)(i) and 21(1)(d) and (e); 21(1)(h); 27(1)(d); and 19(2)(l).
- 66 Ibid., Article 56(1)(a).
- 67 Ibid., Article 56(1)(b) and 60.
- 68 Ibid., Article 60(5) and (6). On the breadth of safety zones around offshore wind farms, see Dawoon Jung, *The 1982 Law of the Sea Convention and the Regulation of Offshore Renewable Energy Activities within National Jurisdiction* (Brill, 2023), 125–127.
- 69 Stuart Kaye, “International Measures to Protect Oil Platforms, Pipelines, and Submarine Cables from Attack”, *Tulane Maritime Law Journal* 31 (2006): 377, 405.
- 70 IMO Assembly Resolution A.671(16) of 30 November 1989, *Safety Zones and Safety of Navigation Around Offshore Installations and Structures* [1]. While the IMO has provided specific guidelines for giving effect to Article 60 (including with respect to the publication obligations of coastal states, flag state obligations, and the measures to be followed in reporting violations of safety zone regulations), these refer to (and appear to be based on) considerations arising from the regulation of traditional oil and gas structures, and do not reflect the practical requirements associated with ensuring the safety of offshore wind infrastructure—in particular, their variable size and density.
- 71 *Arctic Sunrise Arbitration*, [284].
- 72 Ibid., [325]–[326].
- 73 Ibid., [327].
- 74 Ibid., [328] and [331].
- 75 *Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation and Protocol for the Suppression of Unlawful Acts Against the Safety of Fixed Platforms Located on the Continental Shelf*, opened for signature 10 March 1988, entered into force 1 March 1992, 1678 UNTS 201 (1988 SUA Convention and 1988 SUA Protocol).
- 76 1988 SUA Protocol, Article. 2(1).
- 77 Ibid., Article. 2(2).
- 78 Ibid., Article. 3(1).
- 79 *Protocol of 2005 to the Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation and Protocol of 2005 to the Protocol for the Suppression of Unlawful Acts against the Safety of Fixed Platforms Located on the Continental Shelf*, opened for signature 14 October 2005, entered into force on 28 July 2010), 3349 UNTS 1 (2005 SUA Protocol and 2005 SUA Fixed Platforms Protocol).
- 80 2005 SUA Fixed Platforms Protocol, Articles 2–4.
- 81 Natalie Klein, “Responding to Maritime Terrorism in Southeast Asia: What are the alternatives to the 2005 SUA Protocol?”, *Asia-Pacific Journal of Ocean Law and Policy* 8 (2023): 221, 224.
- 82 *ASEAN Convention on Counter Terrorism*, opened for signature 13 January 2007, entered into force 27 May 2011, 3200 UNTS I-54629 (ACCT).
- 83 Ibid., Article VII.
- 84 *ASEAN Maritime Outlook, First Edition* (ASEAN, August 2023), 41–43.
- 85 *Convention for the Protection of Submarine Telegraph Cables*, opened for signature 14 March 1884, entered into force 1 May 1888, [1901] ATS 1 (Cables Convention).
- 86 Dorota Jadwiga Englender, “Article 79” in Alexander Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (CH Beck/Hart/Nomos, 2017), 618, 623.
- 87 Stuart Kaye, “The Protection of Platforms, Pipelines and Submarine Cables under Australian and New Zealand Law” in Natalie Klein et al (eds), *Maritime Security: International Law and Policy Perspectives from Australia and New Zealand* (Taylor & Francis, 2010), 186, 189 (“Protection of Platforms”).

- 88 UNCLOS, Articles 21(c) and 52(1).
- 89 Kaye, "Protection of Platforms", note 87, 191. However, the situation is slightly different in archipelagic waters, where Article 51(2) requires the archipelagic state to "respect existing submarine cables laid by other states and passing through its waters without making landfall" and to permit their maintenance and replacement. However, states seeking to lay new cables will require the permission of the archipelagic state: Richard Barnes and Carmino Massarella, "Article 51" in Proelss, note 86, 382, 288.
- 90 UNCLOS, Article. 19(k).
- 91 Ibid., Article. 79(4) and 60; Douglas R. Burnett, Robert Beckman and Tara M. Davenport, "Overview of the International Legal Regime Governing Submarine Cables", in Douglas R. Burnett, Robert Beckman and Tara M. Davenport (eds), *Submarine Cables: The Handbook of Law and Policy* (Martinus Nijhoff Publishers, 2013): 83.
- 92 Kaye, "Protection of Platforms", note 87, 251.
- 93 Ibid.
- 94 See, e.g., Denmark, *Order No. 939 of 27 November 1992 on the protection of submarine cables and submarine pipelines*, which establishes 200 metre protection zones on either side of submarine cables; Australia, *Telecommunications Act 1997 (Cth)*, which establishes cable protection zones 1 NM either side of cables designated as being "of national significance"; and Thailand, *Navigation Act 2013*, which prohibits anchoring, dredging or using fishing equipment within 100 metres of marked submarine cables.
- 95 For example, in 2024 the North Atlantic Treaty Organisation (NATO) established a Critical Undersea Infrastructure Network within NATO's Maritime Command. See: https://www.nato.int/cps/en/natohq/news_225582.htm.
- 96 See, e.g., Tara Davenport, "The protection of submarine cables in Southeast Asia: The security gap and challenges and opportunities for regional cooperation", *Marine Policy* 171 (2025), 106435 ("protection of submarine cables"); Cynthia Mehboob and Fitriani, "Securing our data: Subsea cables and maritime security in Southeast Asia", *Blue Security: A Maritime Affairs Series* 11 (2025); ASEAN Academic Reports on Submarine Cables, CIL Academic Symposium, 4 May 2024, available at https://cil.nus.edu.sg/wp-content/uploads/2024/05/Combined-ASEAN-Academic-Reports-on-Cables_4-Jun-24-final.pdf.
- 97 Global Wind Energy Council, note 4.
- 98 M.A.J.R. Quirapas and A. Taeihagh, "Ocean renewable energy development in Southeast Asia: Opportunities, risks and unintended consequences", *Renewable and Sustainable Energy Reviews* 137, no. 1 (2021): 1.
- 99 IRENA, *Global Renewables Outlook: Energy Transformation 2050* (IRENA, 2020), 35; Ryan Wiser et al., "Expert Elicitation Survey Predicts 37% to 49% Declines in Wind Energy Costs by 2050", *Nature Energy* 6, no. 5 (2021): 555.
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- 101 Janna Smith et al., "A Race to the Top: Southeast Asia 2024", *Global Energy Monitor* (January 2024), 3, available at <https://globalenergymonitor.org/report/a-race-to-the-top-southeast-asia-2024/>.
- 102 Ibid.
- 103 Quirapas and Taeihagh, note 98, 1.
- 104 Australian Energy Market Operator (AEMO), "2024 Integrated System Plan for the National Electricity Market: A roadmap for the energy transition", 26 June 2024, 25–26.
- 105 Australian Energy Market Commission, "National Electricity Market", <https://www.aemc.gov.au/energy-system/electricity/electricity-system/NEM>. The National Electricity Market connects five regional market jurisdictions: Queensland, New South Wales (including the Australian Capital Territory), Victoria, South Australia, and Tasmania, and supplies around 80% of Australia's electricity. Western Australia and the Northern Territory are not connected to the National Electricity Market.
- 106 C. Briggs et al., *Offshore Wind Energy in Australia: Final Project Report* (Blue Economy Cooperative Research Centre, 2021), 39–40, https://blueeconomycrc.com.au/wp-content/uploads/2022/07/BECRC_OWE-in-Aus-Project-Report_P3.20.007_V2_e190721.pdf. The 'technically assessable' portion is defined by reference to areas that are less than 100km from the coast and depths less than 1000 metres, and not environmentally restricted.
- 107 Energy and Public Land Legislation Amendment (Enabling Offshore Wind Energy) Act 2024 (Victoria).
- 108 Department of Climate Change, Energy, the Environment and Water, "Building an offshore wind industry", <https://www.dcceew.gov.au/energy/renewable/offshore-wind/building-offshore-wind-industry#:~:text=Moving%20towards%20net%20zero%20by,realise%20Australia's%20offshore%20wind%20potential>.
- 109 4C Offshore, "Offshore Wind Farms in Australia", <https://www.4coffshore.com/windfarms/australia/>.
- 110 *Offshore Electricity Infrastructure Act 2021 (Cth)* (OEI Act). The OEI Act applies to the 'Commonwealth offshore area' which covers the area extending from 3 NM to the outer limit of the EEZ (Section 8).
- 111 See further: Griffiths et al., "Policy implications for Offshore renewable energy in Australia: An MSP Approach Supporting the Energy Transition" (2024) *Energy Policy* 114621. At the time of writing, ten feasibility licences had been granted.
- 112 OEI Act, Sections 136, 139, 142 and 148–50.
- 113 On the difference between 'safety zones' and 'protection zones' (and their application to foreign-flagged vessels) see Camille Goodman, "Winds of Change in Australian Waters: The Offshore Electricity Infrastructure Act 2021", *Asia-Pacific Journal of Ocean Law and Policy* 7, no. 1 (2022): 137, 147–149.
- 114 *Crimes (Ships and Fixed Platforms) Act 1992 (Cth)* (CSFP Act), Section 3.
- 115 CSFP Act, Sections 21 to 28.
- 116 *Telecommunications Act 1997 (Cth)* (Telecommunications Act). While the *Submarine Cables and Pipelines Protection Act 1963 (Cth)* also makes it a criminal offence to engage in conduct that results in breaking or injuring a submarine cable or pipeline, including a 'submarine high-voltage cable', this Act only applies to conduct by Australian-flagged vessels.
- 117 Telecommunications Act, Section 9.
- 118 Ibid., Section 10. A protection zone can also include 'restrictions' on the conduct of certain additional activities, set out in Section 11.
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- 120 See, e.g., Australian Communications and Media Authority, "Apply to install a submarine cable", available at <https://www.acma.gov.au/apply-install-submarine-cable>.
- 121 World Bank, *Technical Potential for Offshore Wind in Vietnam* (World Bank, 2020, revised 2021), available at <https://documents1.worldbank.org/curated/en/340451572465613444/pdf/Technical-Potential-for-Offshore-Wind-in-Vietnam-Map.pdf>.

- 122 VnEconomy, “Government Approves Revised Power Development Plan 8” (17 April 2025), available at <https://vneconomy.vn/government-approves-revised-power-development-plan-8.htm>.
- 123 Vietnam, *Law No. 61/2024/QH15 (Revised Electricity Law)*, Article 20(b). The Electricity Law provides, *inter alia*, preferential policies for offshore wind including exemptions from levies and a legal basis for long-term contracted output (Article 26(3)); permits foreign and non-state investor participation (Article 26(5)); and lifts previous restrictions on project and capital transfers subject to general legal compliance. It further introduces procedural clarity for project surveying, investment approval, and investor selection, with inter-agency coordination overseen at the Ministerial level (Articles 26–29).
- 124 Vietnam, *Decree No. 58/2025/ND-CP Detailing a number of articles of the Law on Electricity on renewable energy and new energy development*.
- 125 Baker McKenzie, “Vietnam: New Decree No. 58/2025/ND-CP’s Specific New Regulations on Large-Scale Offshore Wind Power Projects”, 3 March 2025, 11, available at https://insightplus.bakermckenzie.com/bm/energy-mining-infrastructure_1/vietnam-new-decree-no-582025nd-cps-specific-new-regulations-on-large-scale-offshore-wind-power-projects.
- 126 Vietnam, *Law No. 18/2012/QH13 (Law of the Vietnamese Sea)*, Article 34(3) establishes the 500-metre safety zone; Article 34(4) prohibits the establishment of any installation that would impede the use of sea lanes recognized as essential for navigation; Article 34(5) introduces provisions requiring the removal of disused structures to avoid causing navigational hazards.
- 127 Vietnam, *Law No. 95/2015/QH13 (Vietnam Maritime Code)*.
- 128 *Ibid.*, Article 124(b).
- 129 Vietnam, *Decree No 58/2017/ND-CP on Guidelines for some Articles of the Vietnam Maritime Code on Management of Maritime Operations* (as amended by *Decree No. 34/2025/ND-CP Amending and Supplementing several Articles of Decrees in the Maritime Sector*).
- 130 Vietnam, *Maritime Code*, Articles 124 to 126.
- 131 Vietnam, *Law No. 100/2015/QH13 (Criminal Code of Vietnam)*. The Criminal Code as amended in 2017 applies to criminal offences committed within Vietnam’s territory, including offences committed on sea-going vessels and airplanes operating in Vietnam’s EEZ or continental shelf, or the consequences thereof (Article 5).
- 132 Vietnam, *Law No. 24/2023/QH15 (Law on Telecommunications)*.
- 133 World Bank, *Offshore Wind Roadmap for the Philippines* (Report, April 2022) vii.
- 134 Philippines Department of Energy, *Philippine Energy Plan 2023–2050, Volume I: Transitioning to Reliable, Clean, and Resilient Energy* (April 2024), 11.
- 135 *Ibid.*
- 136 Philippines, *Republic Act No 9513, An Act promoting the development, utilization and commercialization of renewable energy resources, and for other purposes* (28 July 2008) (Renewable Energy Act).
- 137 Philippines, *Executive Order No. 21, Directing the Establishment of the Policy and Administrative Framework for Offshore Wind Development* (19 April 2023).
- 138 Philippines, *Department of Energy (DOE) Department Circular (DC) No. 2023-06-0020, Policy and Administrative Framework for the Efficient and Optimal Development of the Country’s Offshore Wind Resources* (21 April 2023).
- 139 Philippines, *Department of Environment and Natural Resources (DENR) Administrative Order (AO) No 2024-02* (18 January 2024).
- 140 Pursuant to Section 15 of the DOE-DC, the Department of Energy is to coordinate with the Department of Transportation, the Department of National Defence, and the Department of Interior and Local Government for their “intensified presence” in offshore wind project areas, to ensure the safety and security of offshore wind projects.
- 141 Philippines, *Republic Act No 9993, Philippines Coast Guard Law* (27 July 2009) (PCG Law).
- 142 Philippines, *Implementing Rules and Regulation for the Republic Act No. 9993 (The Philippine Coast Guard Law)* 2009 (IRR).
- 143 PCG Law, Sections 3(a), (f) and (k).
- 144 IRR, Rule 3(e). Maritime-related activities are defined in Rule 3(e)(1) as including (but not limited to): navigational rules and the designation of sea-lanes; marine surface and underwater laying activities such as submarine cables and pipelines, and other fixed or temporary structures; and offshore research, surveys and exploration, including operation of oil rigs and drilling units.
- 145 *Ibid.*, Rules 3(a)(1) and (e).
- 146 *Ibid.*, Rule 3(k).
- 147 Philippines, *Proclamation No 72, s. 2001, Establishing Safety and Exclusion Zones for Offshore Natural Gas Wells, Flowlines, Platform, Pipelines, Loading Buoy & other related Facilities for the Malampaya Deep Water Gas-To-Power Project Over Certain Waters & Submerged Lands Adjacent to Batangas, Mindoro and Palawan* (Proclamation No 72).
- 148 Philippines, *Act No 3815, Revising the Penal Code and Other Penal Laws (Revised Penal Code)*.
- 149 Philippines, *Republic Act No. 11479, Anti-Terrorism Act of 2020* (22 July 2019). For example, this Act creates offences in relation to threats or damage to ‘critical infrastructure’ which could apply to offshore installations.
- 150 Philippines, *Republic Act No. 7925, Public Telecommunications Policy Act* (1 March 1995), Section 3.
- 151 DENR-AO, Section 6[B], Section II.1, II.2.
- 152 *Ibid.*, Section II.1; III.1.C.
- 153 IRR, Rule 3(k)(4).
- 154 Pondera, “Final Report: Wind Energy Development in Indonesia – Investment Plan”, 23 September 2024, available at <https://www.energytransitionpartnership.org/wp-content/uploads/2024/09/20240906-Final-Report-Wind-Energy-Development-in-Indonesia-Investment-Plan-v2.0.pdf>, 5.
- 155 Ministry of Energy and Mineral Resources, *Materials of the Ministry of Energy and Mineral Resources* (Ministry of Energy and Mineral Resources, Jakarta, 2021); Ariana Soemanto and Raldi Hendro T Koestoer, “Scenario Insight of Energy Transition”, *Indonesian Journal of Energy* 6, no. 1 (2023): 48, 53.
- 156 Indonesia, *Law No. 32 of 2014 on Maritime Affairs*, Article 32.
- 157 Indonesia, *Government Regulation No. 6 of 2020 on Marine Buildings and Installations* (GR 6/2020), Article 27. Paragraph (3) and (4) of this Article stipulates that this zone is intended to prevent interference with offshore structures, ensure safe navigation, and secure construction, operational, maintenance, and dismantling activities. Similar wording appears in Articles 38 and 40 of *Government Regulation No. 5 of 2010 on Navigational Matters* (GR 5/2010), as well as Article 80(2) of *Ministerial Regulation (PM) No. 129 of 2016 on Sea Lanes and Offshore Structures*, as amended by *Ministerial Regulation (PM) No. 40 of 2021*.

- 158** Article 61 of Law No. 32 of 2014 tasks Bakamla (Maritime Security Agency) with conducting security and safety patrols across Indonesia's waters and maritime zones, while Articles 62 and 63 expand its mandate to broader monitoring and enforcement responsibilities.
- 159** For example, GR 5/2010 reinforces maritime security measures under Articles 51 to 70 by regulating critical telecommunications systems, including the Global Maritime Distress and Safety System, Vessel Traffic Services, and Ship Reporting Systems, which are essential for real-time threat detection, distress alerting, and vessel coordination. Moreover, Article 41 (navigation aids) and Article 72 (telecommunications systems) prohibit any acts of damage or interference, including unauthorized attachment or destruction, providing targeted legal protection for offshore installations and submarine cables against both accidental and intentional threats.
- 160** The term used is *kabel listrik bawah laut*, which directly translates to *underwater electricity cable*, see Article 2(15)(j) of GR 6/2020.
- 161** Lee Cordner, *Offshore Oil and Gas Safety and Security in the Asia Pacific: The Need for Regional Approaches to Managing Risks* (RSIS Monograph No 26, S Rajaratnam School of International Studies, 2013): 59.
- 162** *Ibid.*, 61.
- 163** International Chamber of Commerce, *IMB Annual Piracy and Armed Robbery Report 2024* (2024), <https://icc-ccs.org/maritime-piracy-dropped-in-2024-but-crew-safety-remains-at-risk/>
- 164** Carolin Liss, "Southeast Asia's Maritime Security Dilemma: State or Market", *The Asia-Pacific Journal: Japan Focus* 5, no. 6 (2007): 1, 2.
- 165** *Ibid.*
- 166** Cordner, note 161, 49–50.
- 167** *Ibid.*, 61–78.
- 168** As shown in Figure 5, there are some exceptions to this: Malaysia's *Merchant Shipping Ordinance 1952* includes some offences and powers relating to intentional damage and security incidents; Brunei's *Maritime Offences (Ships and Fixed Platforms) Order 2007* criminalises intentional damage to fixed platforms; and Thailand's *Navigation Act 2013* establishes cable protection zones that apply to power cables as well as telecommunication cables, with accompanying offences. However, the overall pattern is more of a patchwork of regulation than comprehensive coverage.
- 169** See, e.g., Germany, *Offshore Wind Energy Act (WindSeeG) 2017*, Section 53(2), which provides that safety zones shall extend up to 500 metres, measures from every point of the external edge around the facilities. Similarly, Norway, *Regulations on the marking and establishment of safety zones associated with facilities for renewable energy production*, §4.
- 170** See, e.g., France, *Decree of 17 May 2023 regulating maritime activities within and immediately surrounding the Banc de Guerande offshore wind farm*, which allows transit by vessels less than 25 metres, limited to 12 knots, subject to operating an AIS transponder at night, in poor visibility or when the wind is above 11 knots, and a prohibition on approaching within 50 metres of a wind turbine or 200 metres of a sub-station, or anchoring within the windfarm. Similarly, Netherlands, *Code of Conduct for safe passage through offshore wind farms*, which permits access by vessels up to 24 metres, during daylight hours, operating an AIS transponder and remaining 50 metres from turbine towers and 500 metres from substations.
- 171** See, e.g., Taiwan, *Navigation safety regulations for vessels in offshore windfarm during construction and operation and Sailing Direction for the Changhua Wind Farm Channel*, which prohibits navigation through offshore wind farms but establishes a traffic separation scheme within the broader offshore wind zone to facilitate navigation through the area.
- 172** See, e.g., United Kingdom, *The Electricity (Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) Regulations 2007*, Section 2, which provides that in relation to the ongoing operation of a wind turbine, safety zones will have a radius of 50 metres measures from the outer edge of at sea level of the turbine tower. Similarly,
- 173** See notes 38 to 40 and associated text.
- 174** UNCLOS, Article. 113.
- 175** *Ibid.*, Article. 21(c), 52(1) and 79(4).
- 176** *Ibid.*, Article. 60.
- 177** Joint Ministerial Statement, *Twenty-First ASEAN Ministers on Energy Meeting Plus Three (China, Japan, Korea)*, (27 September 2024), available at <https://asean.org/wp-content/uploads/2024/09/Final-JMS-of-21st-AMEM3.pdf>, 1.
- 178** See, e.g., Kate Clayton, *ASEAN-Australia Maritime Cooperation Forum Report* (2024), available at https://www.latrobe.edu.au/_data/assets/pdf_file/0007/1601584/blue-sec-report.pdf.
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