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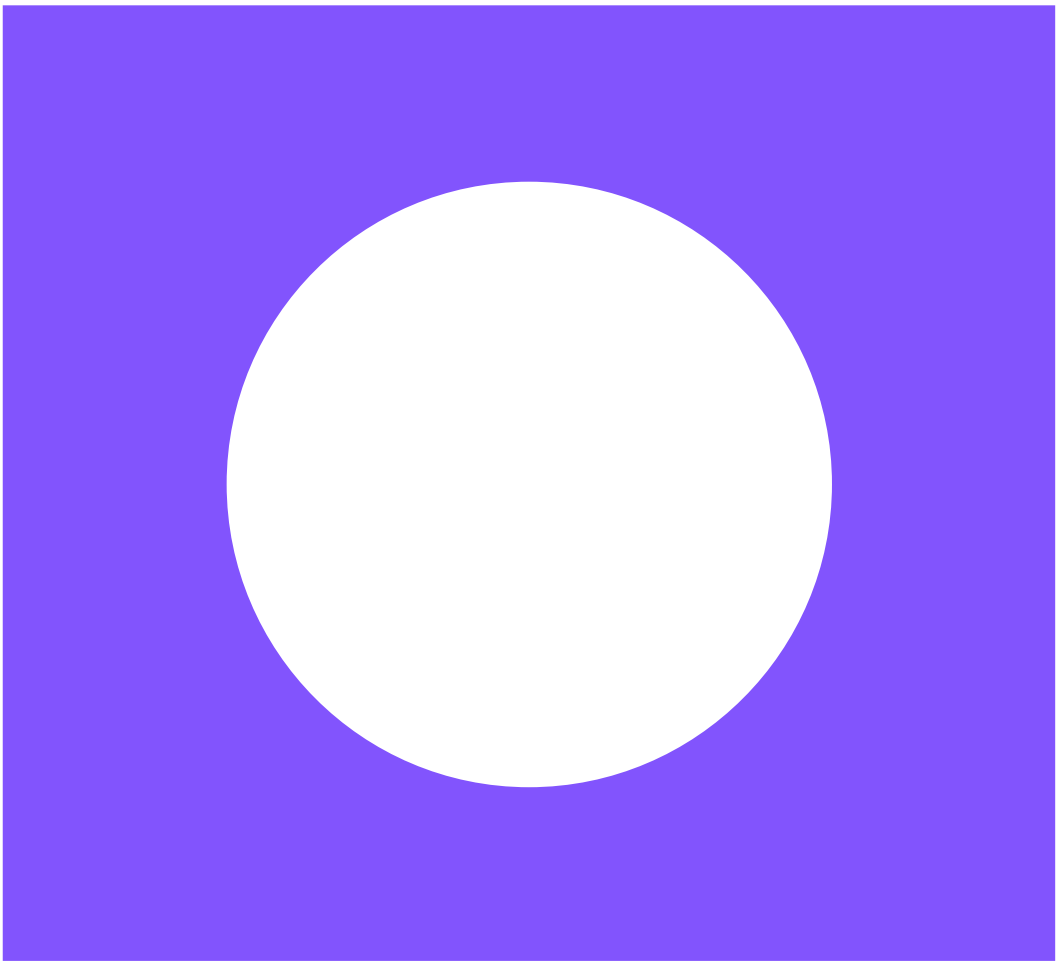

Formosa 4 Offshore Wind Farm in Taiwan

Cumulative Impact Assessment

September 2025

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Issue and Revision Record

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Executive summary

Formosa 4 International Investment Co., Ltd. and its subsidiary Formosa 4 Wind Power Co., Ltd. (herein referred to as "Project Company" or "Formosa 4") is proposing to develop an offshore windfarm (OWF) in Taiwan (herein referred to as the "Project"). The Project is located approximately 20km offshore from the coast of Miaoli County, on the Western coast of Taiwan.

The Project participated in the Third Round of Offshore Wind Project Development (herein referred to as "Round 3.1") by the Energy Administration (EA)[1], a statutory agency under the Ministry of Economic Affair (MOEA). In Round 3.1, the Project has been awarded a grid allocation up to 495MW, with the project being connected to the grid latest by end of 2027. In April 2024, MOEA announced the availability of a one-year extension to the grid connection deadline for the Round 3.1 projects. The projects were to apply in the form of an official letter to Taiwan Offshore Wind Industry Association (TOWIA), in which the TOWIA will send an official letter to the MOEA for the application. The Round 3.1 projects are expected to be granted the extension as per the application to MOEA. As based on the latest information received by the Project Company, the Project is expected to complete construction and connect to the grid in 2028, and the target COD will be in Q2 2029 instead. This is because the Project Company still needs to apply for an Electrical Business License (EBL).

The Project received approval from MOEA on 30 December 2022 for up to 495MW of installed capacity. It is planned to consist of 35 wind turbine generators (WTGs), each of 14.142MW capacity. The total installed capacity will be 495MW. The WTGs will be located at water depths of approximately 57m to 66m below mean sea water level (MSWL). The Project has two export cable strings and one planned landing point at Fangli village, which is to be connected to a Project dedicated onshore substation (OnSS) then to Taiwan Power Company (TPC) OnSS. The operation period is planned for 20 years, based on the asset life.

As part of the Project's financing approach, the Project may be required to demonstrate adherence to the Equator Principles (EP). Therefore, Mott MacDonald have been commissioned by Formosa 4 to undertake a cumulative impact assessment (CIA), alongside other environmental and social (E&S) services.

This report presents a CIA which has been undertaken to identify the Project related environmental and social impacts (as well as associated risks) in terms of their potential to contribute to cumulative impacts on valued environmental and social components (VECs) on which other existing or future developments may also have detrimental effects. In addition, the CIA aims to assess the significance of the Project's abovementioned (cumulative) impacts to propose measures to avoid, minimise and/ or offset these impacts to the extent practically possible.

The following VECs are discussed within this report in terms of baseline status and cumulative impact assessment:

- Biodiversity VECs:
  - Marine habitat
  - Marine flora and fauna
  - Migratory birds (including seabirds at sea)
- Socio-economic VECs:

[1] Formerly known as Bureau of Energy (能源署); renamed the Energy Administration on 26 September 2023.

– Community livelihood: fisheries resources and zones

For the purpose of this CIA, other than the Project, there are other offshore windfarms considered within the CIA to assess the cumulative impacts on the VECs. This includes Deshuai OWF[2], Formosa 1 OWF, and Formosa 2 OWF.

For the respective VECs discussed, a set of actions already in place or planned to be implemented for the VECs have been extracted from the various projects' published environmental impact assessment (EIA) and relevant reports. Further recommendations are also made on strategies in terms of collaboration amongst developers for achieving effective mitigation and monitoring of cumulative impacts on the VECs in the broader context.

It is noted that comprehensive mitigation and monitoring plans have been identified in the various offshore windfarm projects' EIA reports. Nevertheless, it is important for the Project and adjacent windfarm developments to coordinate management plans and share information with each other for a more robust and comprehensive management of the identified cumulative impacts.

[2] For Deshuai offshore windfarm, it is noted that MOEA has issued letter to the developer of Deshuai offshore windfarm on 21 May 2025 to revoke the development rights. However, reference to Deshuai offshore windfarm has not been removed in this CIA assessment. More information can be found in the scope and limitations' section of this CIA in Section 1.2.2.

1 Introduction

1.1 Overview

Formosa 4 International Investment Co., Ltd. and its subsidiary Formosa 4 Wind Power Co., Ltd. (herein referred to as “Project Company” or “Formosa 4”) is proposing to develop an offshore windfarm (OWF) in Taiwan (herein referred to as the “Project”). The Project is located approximately 20km offshore from the coast of Miaoli County, Taiwan.

The Project participated in the Third Round of Offshore Wind Project Development (herein referred to as “Round 3.1”) by the Energy Administration (EA)[3], a statutory agency under the Ministry of Economic Affair (MOEA). In Round 3.1, the Project has been awarded a grid allocation up to 495MW with the project being connected to the grid latest by end of 2027. In April 2024, MOEA announced the availability of a one-year extension to the grid connection deadline for the Round 3.1 projects. The projects were to apply in the form of an official letter to Taiwan Offshore Wind Industry Association (TOWIA), in which the TOWIA will send an official letter to the MOEA for the application. The Round 3.1 projects are expected to be granted the extension as per application to MOEA. As based on the latest information received by the Project Company, the Project is expected to complete construction and connect to the grid in 2028, and the COD will be in Q2 2029 instead. This is because the Project Company still needs to apply for an Electrical Business License (EBL).

As part of the Project’s financing approach, the Project may be required to demonstrate adherence to the Equator Principles (EP). Therefore, Mott MacDonald have been commissioned by Formosa 4 to undertake a cumulative impact assessment, alongside other environmental and social (E&S) services.

1.2 Aims and objectives

1.2.1 Purpose

This CIA aims to:

- Identify the Project related environmental and social impacts (as well as associated risks) in terms of their potential to contribute to cumulative impacts on valued environmental and social components (VECs)[4] on which other existing or future developments may also have detrimental effects
- Assess the significance of the Project’s abovementioned (cumulative) impacts in order to propose measures to avoid, minimise and/or offset these impacts to the extent practically possible

The aims of the CIA are achieved by implementing the framework approach, as further described in Section 2, based upon the good practice handbook[5] as published by International Finance Corporation (IFC) (IFC, 2013). The six steps outlined in the “Good Practice Handbook on Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets” (IFC CIA Handbook) have been followed.

[3] Formerly known as Bureau of Energy (能源署); renamed the Energy Administration in 26 September 2023.

[4] See Section 2 definition.

[5] IFC Good Practice Handbook: Cumulative Impact Assessment and Management, 2013

1.2.2 Scope and limitations

This CIA considers potential offshore developments along the western coast of Taiwan and the spatial and temporal boundaries defined for this CIA is elaborated in Section 3.

Since the drafting of this report, one of the offshore windfarm developments scoped within this CIA in Table 4.5 – Deshuai offshore windfarm, has been cancelled as reported in local news articles[6]. According to the article, MOEA has issued an official letter (dated 21 May 2025) to the developer of Deshuai offshore windfarm to revoke the development rights of the offshore windfarm. However, it is noted that this letter has not been made publicly available and no official announcement has been published online from MOEA. Although the relevant development capacity has not been formally reallocated yet, it is unlikely for Deshuai offshore windfarm to proceed. Currently, reference to Deshuai offshore windfarm has not been removed from this CIA assessment, however, as there will now be no other projects in construction at the same time as the Project, potential cumulative impacts will be lower than what is identified in this CIA report. In relation to the additional cumulative collision risk modelling (CRM) (further details in Section 6.2.3.1), it has been conducted without considering Deshuai offshore windfarm.

This CIA is limited to available resources either provided by the Project Company or publicly available, such as the local Environmental Impact Assessment (EIA) reports which have been published on the Ministry of Environment (MoEnv) site of Taiwan and other online resources. As the major impacts of windfarm developments mostly occur in the offshore area, this CIA focuses more on marine aspects such as marine macrofauna and sensitive habitats, as well as the social impacts on fisheries.

The offshore components of the Project (ie WTGs, submarine cables) is situated approximately 20km away from the coast. At such distance from the coast, the potential key/ material cumulative impacts (eg underwater noise, bird collision risk) are largely from similar nearby offshore windfarms. Other coastal developments (eg ports, pipeline projects) are not included in this assessment, as these coastal developments are usually situated nearer to the coast.

Furthermore, the subsequently identified VECs are primarily influenced by and pertinent to other offshore windfarm developments. Given the absence of significant interactions with other development types (eg ports, pipeline projects) the exclusion of these coastal developments from this CIA is supported by their unlikely potential for cumulative impact. Due to the above reasons, coastal developments have been scoped out of this CIA.

In this CIA, no quantitative analysis such as modelling, and calculations were undertaken. This report was prepared based on professional judgment and available information (eg qualitative assessment on the cumulative impacts with reference to the findings of the approved EIA reports).

Of note, the status described for existing, planned, or reasonably foreseeable developments scoped in this CIA (Section 4.3) is based on information available as of July 2025.

1.3 Project background and location

The Project's offshore windfarm area will be approximately 58km^2 in size and located approximately 20km offshore from Tongxiao Township (通霄鎮), Miaoli County, on the western coast of Taiwan (see Figure 1.1).

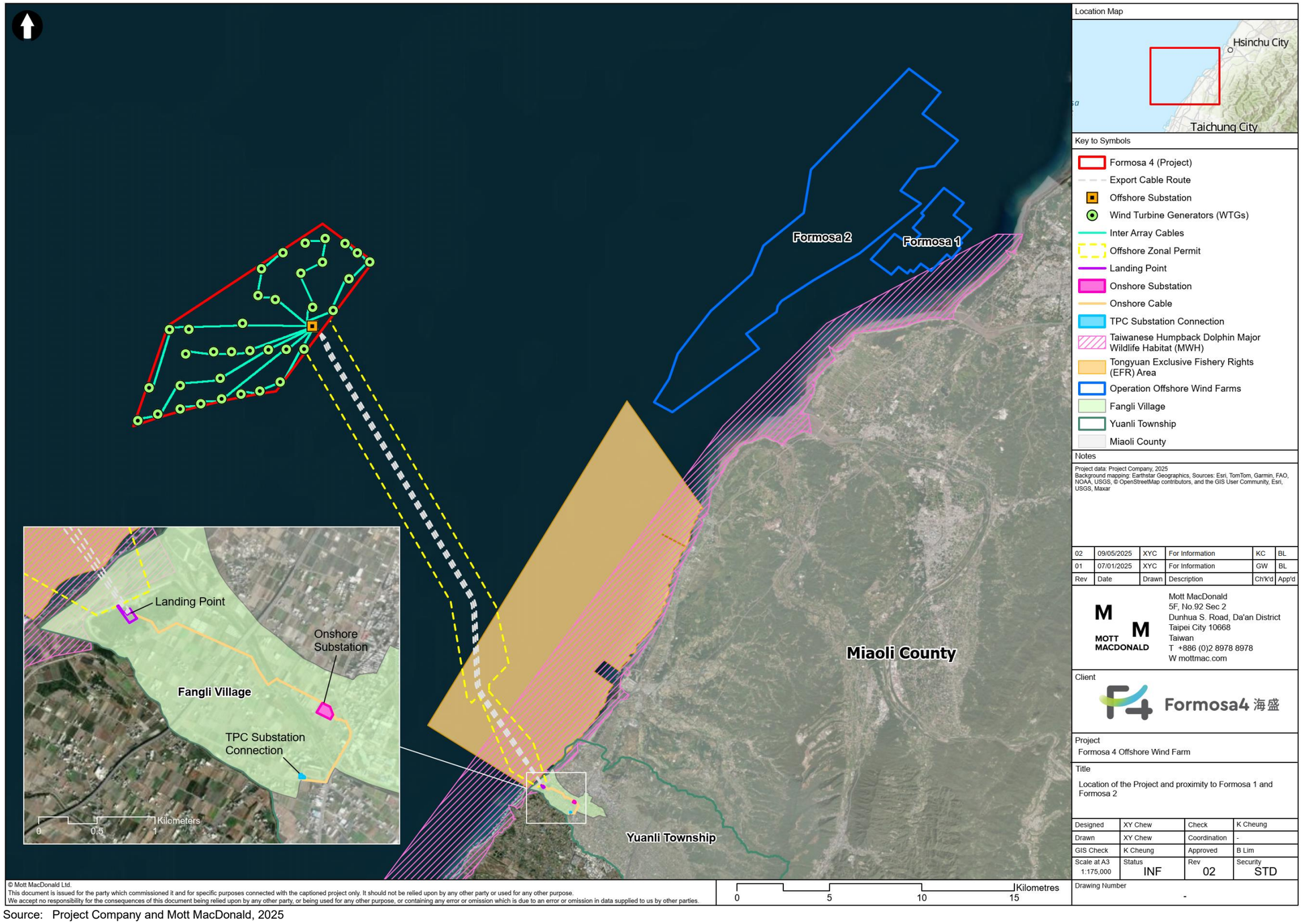
[6] Commercial Times news article: https://www.ctee.com.tw/news/20250525700516-430104 (Last accessed: 4 June 2025)

The Project is located further offshore from the neighbouring Formosa 1 and Formosa 2 windfarms. The Project's location is illustrated in Figure 1.1 and Figure 1.2.

The Project has successfully obtained regulatory approval for its final environmental impact statement (EIS, 環境影響說明書) and environmental deviation report (EDR) from the Ministry of Environment (MoEnv) on 11 August 2023 and 22 July 2024, respectively.

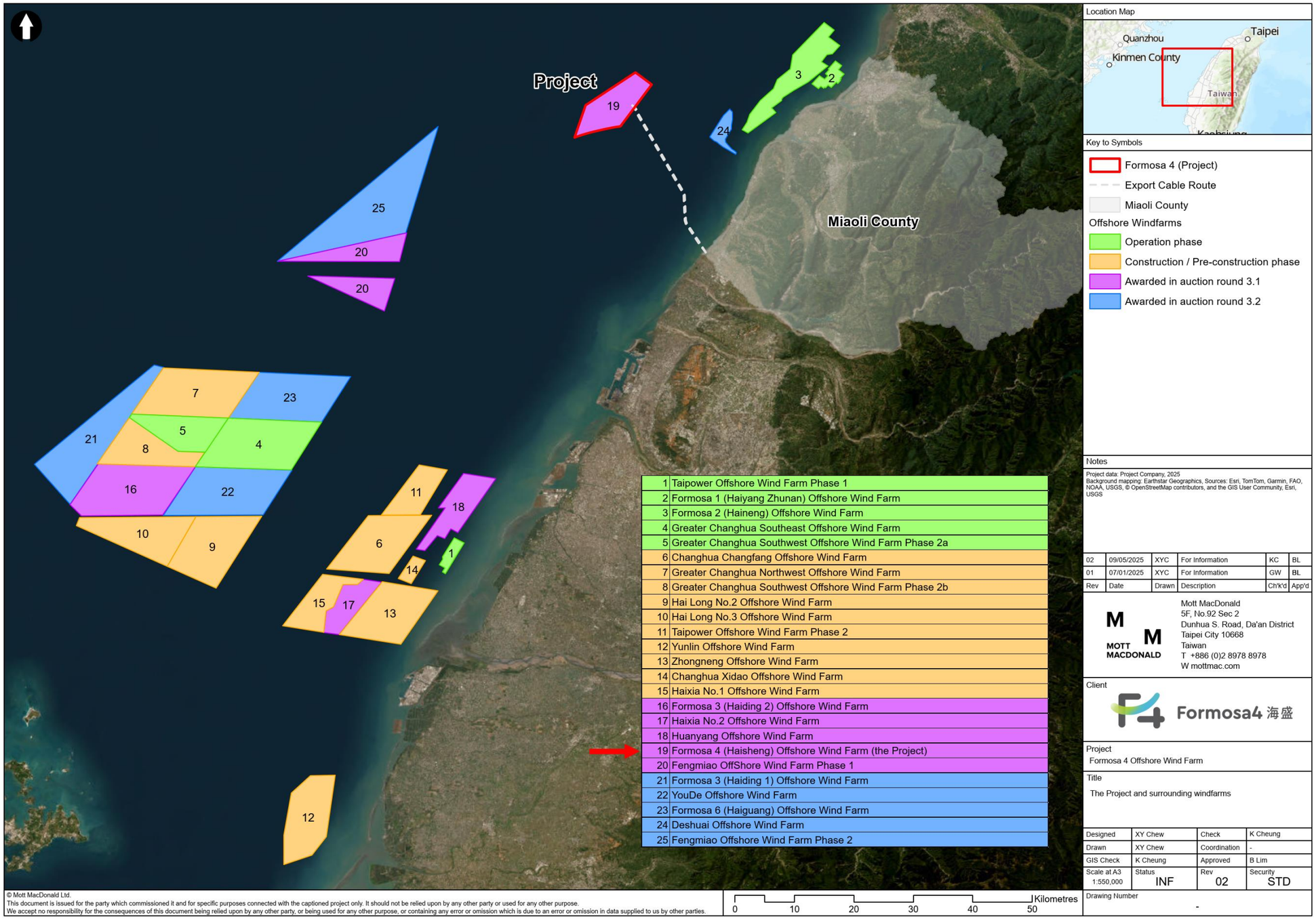
The Project received approval from MOEA on 30 December 2022 for up to 495MW of installed capacity. It is planned to consist of 35 wind turbine generators (WTGs), each of 14.142MW capacity. The total installed capacity will be 495MW. The WTGs will be located at water depths of approximately 57m to 66m below mean sea water level (MSWL). The Project has two export cable strings and one planned landing point at Fangli village, which is to be connected to a Project dedicated onshore substation (OnSS) then to Taiwan Power Company (TPC) OnSS. The operation period is planned for 20 years, based on the asset life.

Figure 1.1: Location of the Project and proximity to Formosa 1 and Formosa 2



Source: Project Company and Mott MacDonald, 2025

Figure 1.2: The Project and surrounding windfarms



Source: Project Company and Mott MacDonald, 2025

1.4 Project components

The details of the Project components are presented in Table 1.1 below.

Table 1.1: Summary of the Project components and schedule

Aspect	Project
Project components	
Windfarm capacity	495MW
Windfarm area	58km^2
Number of WTGs (and capacity)	35 WTGs (14.142MW each)
Offshore substation (OSS)	One (1) planned OSS
Onshore substation (OnSS)	One (1) planned OnSS in Fangli village
Transmission	66kV / 161kV / 230kV
Inter-array cables (IAC)	Eight (8) 66kV IAC strings
Export cables	Two (2) 230kV export cable strings with approximate length of 27km to the landing point, sharing the same cable alignment route. Cable landing point is located at Fangli village, Yuanli Township.
Transmission line (onshore)	One (1) 161kV transmission cable with approximate length of 4km from OnSS to grid connection point
Grid connection point	Fangli (TPC), located in Yuanli Township, Miaoli County
Construction commencement	Onshore: Q2 2025 (targeted) Offshore: Q2 2026 (targeted)
Construction completion	Onshore: Q4 2027 (targeted) Offshore: Q4 2028 (targeted)
Commercial operation date (COD)	Targeting Q2 2029

Source: Project Company and Mott MacDonald, 2025

1.5 Implementation schedule

The key milestones for the Project's implementation, with current assumptions, are summarised in Table 1.2 below. The offshore construction is expected to commence in 2026, with the Commercial Operation Date (COD) by Q2 2029.

Table 1.2: Project implementation schedule

Project milestone	2025				2026				2027				2028			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Onshore construction																
Offshore construction																
COD	Targeting Q2 2029															

Source: Project Company and Mott MacDonald, 2025

1.6 Project alternative analysis

The alternative assessment in the Project's final EIA section 8.3 included alternatives such as the termination of the Project, site alternatives and technology alternatives.

The Project is designed to align with energy policy in accelerating Taiwan's growth of offshore wind farms, promoting diverse energy sources, self-sufficiency, and environmental conservation. Therefore, the Project is in a positive position to support Taiwan's goals and renewable energy development in the Asia-Pacific region. In conjunction, there are no site alternatives available for this Project.

In terms of technology alternatives, the Project considered the feasible options available for the capacity and foundation of WTGs. These include capacity for each WTG ranging from 9.5 to 20MW, and the foundation type of the WTGs to be either sleeve or three-legged jacket. The Project will also consider the most applicable turbine model and capacity in the future market, as well as future piling methods that enter the market.

1.7 Summary of land acquisition and access to marine areas

The Project is expected to have one (1) onshore substation. Formosa 4 International Investment Co., Ltd. obtained ownership of the plot in Xihai Section, Yuanli Township (苑裡鎮 西海段) (which is privately owned) in August 2023 for the construction of the onshore substation. Regarding application for agricultural land use within Yuanli urban planning area (ie to convert the land plot designated purpose) to Miaoli County Government (MCG), the Project obtained approval on 23 August 2024 in accordance with the Enforcement Rules of Urban Planning Act and relevant regulations.

Majority portions of the onshore cables are expected to obtain the right of way from MCG and Freeway Bureau, Ministry of Transportation and Communications (MOTC). A few plots which the cable routes intersect are managed by the National Property Administration (NPA), Ministry of Finance, and onshore cables in the landfall area are located in the forestry areas administered by the Forestry and Nature Conservation Agency (FCA), Ministry of Agriculture. The Project has been processing with lease applications to the NPA and FCA. The right of way applications are expected to receive approval from MCG and Freeway Bureau before construction commences. No physical or economic displacement is expected for the onshore works.

Within the Project's signed FCCA (dated 28 March 2025), the Project also requests TFA to advise all local fisher folk (whether members or not) to avoid activities and navigation that may obstruct or hinder project work, which include working vessel routes and actual activities within the project's area. This is applicable from pre-construction surveying, construction and operation phase, and up to decommissioning phase, and is currently planned to be in effect for 30 years in total. Access restrictions of offshore and onshore components for the construction and operation and maintenance (O&M) phase are summarised in Table 1.3 below.

Table 1.3: Summary of land acquisition and access to marine areas

Location	Component	Description/access restriction
Onshore components	Onshore (buried) cables	The leased area is expected to be state-owned land (ie largely within road alignment) and land owned by the Project Company.
	Onshore substation (OnSS)	The total site area is private-owned land, previously agricultural lands but confirmed to not have previous livelihood activities.

Location	Component	Description/access restriction
Offshore components	Offshore cables during construction phase	● With two (2) 230kV export cable strings with approximate length of 27km to the landing point, and assuming both strings will have typical construction exclusion zone widths of around 500m total, there will be temporary access restrictions on the offshore cable area. It is to note that this restricted area will occur in segments. ● Based on the FCCA, fisher folk are requested to not hinder any construction project work. However, vessels are not restricted from fishing or crossing the windfarm area. No fishing methods are specifically restricted within the offshore project area.
	Offshore cables during O&M phase	Fisher folk are requested to not hinder any operation phase project work (eg maintenance). No fishing methods are specifically restricted within the offshore cable area.
	Wind farm area during construction phase, including WTGs and offshore substation	● The windfarm area is 58km^2. ● Fisher folks are requested to not hinder any construction project work. No fishing methods are specifically restricted within the offshore project area. ● Warning lights will be installed at the perimeter of the wind farm to alert surrounding fishing vessels.
	Wind farm area during O&M phase, including WTGs and offshore substation	Fisher folk are requested to not hinder any operation phase project work (eg maintenance). No fishing methods are specifically restricted within the offshore project area.

Source: Project Company and FCCA, dated 28 March 2025

1.8 Document structure

This CIA is structured as follows:

- **Section 1** (ie this section) outlines the aims and objectives of the CIA and Project, and provides a project description.
- **Section 2** describes the methodology for undertaking this CIA, including the definition of valued environmental and social components (VECs) as well as the methodology of six step approach prescribed by the IFC CIA Handbook to develop CIA.
- **Section 3** defines the spatial and temporal boundaries of this CIA.
- **Section 4** presents the identified Project's VECs, and existing and foreseeable future development.
- **Section 5** presents a summary of applicable VECs' baseline data.
- **Section 6** assesses future conditions of the selected VECs, as a result of cumulative impacts of the Project with other developments.
- **Section 7** presents the management strategies designed to address the Project's incremental contribution to cumulative impacts on the selected assessed VECs.
- **Section 8** displays the references used for this document.

2 Approach and methodology

2.1 Overview

The approach used in this CIA was developed based on the recommendations found in the Guidance Note 1 (GN1) of the IFC Performance Standard (PS) 1, specifically in paragraphs GN37 through GN43, and in the CIA approach outlined in IFC's guidance document named "Good Practice Handbook on Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets" (thereafter known as "IFC CIA Handbook").

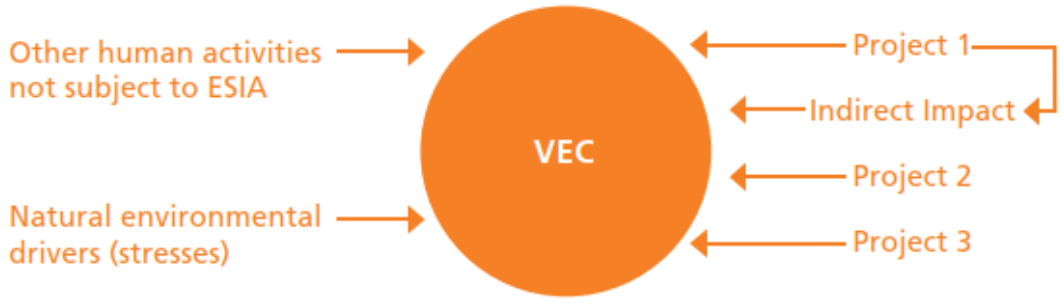
Of particular note, paragraph GN41 in IFC Guidance Note 1 recommends that clients assess cumulative impacts from: (a) further planned development of the project and other project-related developments; (b) any existing project or condition whose impacts may be exacerbated by the project; and (c) other development of the same type that are realistically defined at the time of the risks and impacts identification process. The IFC CIA Handbook further details the IFC GN 1 requirements and highlights the importance of a defined scope for CIA assessment by introducing the concept of VECs.

2.2 Valued environmental and social components

Valued environmental and social components (VECs) are environmental and social attributes (ie physical features, habitats, biodiversity, ecosystem services, natural process, social conditions, cultural aspects) which may be directly or indirectly affected by a specific development, that are often affected by cumulative effects of several developments. The VECs are often the ultimate receptors of the combined impacts as they tend to be at the end of ecological pathways.

The identification of VECs begins from a project-centric perspective, where the environmental and social attributes potentially adversely affected by a specific project are identified. The focus then shifts to be centred around the VEC, whereby the study area considered is the area in which the VEC occurs where other stressors (eg other developments, natural and social drivers) may affect them (see Figure 2.1).

Figure 2.1: CIA's VEC-centric approach



Source: "Good Practice Handbook on Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets", IFC, August 2013 (Downloaded from https://www.ifc.org/en/insights-reports/2013/publications-handbook-cumulativeimpactassessment)

In summary, this CIA aims to assess the cumulative impacts which might occur when the effects of the Project components, other projects and/or other activities or stressors overlap with each other by affecting the same VECs.

2.3 Six step approach

In developing this CIA, the following six steps (as prescribed by the IFC CIA Handbook) were used to guide the framework approach for assessment:

1. Determine spatial and temporal boundaries (refer to Section 3)
2. (a) Identify VECs (using publicly available and approved local EIA reports which have undergone consultation with affected communities and stakeholders as well as appraisals from the concerned regulatory agency) (refer to Section 4.2); and (b) identify all developments and external natural stressors affecting VECs (refer to Section 4.3)
3. Determine present condition of each identified VECs (refer to Section 5)
4. Assess cumulative impacts (refer to Section 6)
5. Evaluate the significance of cumulative impacts over the predicted future conditions (refer to Section 6)
6. Recommend feasible management strategies (refer to Section 7) to include:
    a. Adequate procedures to manage cumulative impacts
    b. Identify appropriate monitoring indicators
    c. Effective supervision mechanisms

The commentary and assessment of the above-mentioned six steps are presented within the subsequent sections of this report.

2.4 Documents reviewed

The documents/ sources reviewed for this CIA were sourced from various websites/ publicly available information, as well as the Project Company. The full list of documents reviewed for this CIA is shown in Appendix A.

3 Step 1: Determination of spatial and temporal boundaries

3.1 Overview

The cumulative impact assessment of the VECs will encompass the geographic and temporal extent of the Project's impacts and the impacts from the other relevant current or foreseeable future developments. According to the IFC CIA handbook, the first boundaries are often set by professional judgement but improved as further supporting information (eg EIA report) indicates that a different boundary is required for the analysis. Thus, this section also describes how the boundaries have been modified to take into account the effects of significant impacts, and scientific concerns or stakeholders' opinion derived from previous consultations during the EIA stage.

The boundaries for this CIA were determined following the process below (Step 1):

- Determination of the preliminary boundaries according to the Project's significant impacts on the relevant VECs
- Identification of the existing, planned or reasonably defined developments located within the boundaries of the Project and that could potentially affect the relevant VECs
- Final delineation of the geographic and temporal boundaries, if necessary, after assessment of the cumulative impacts (Section 6)

This process is further described in the subsections below. Although it is discussed in a stepwise fashion, the identification of the spatial and temporal boundaries of a CIA is an iterative process that took place simultaneously with the identification of relevant VECs and of the existing and foreseeable future developments that can impact relevant VECs.

3.2 Spatial boundary

Following the advice in the IFC CIA good practice handbook[7], the spatial boundary for this CIA had been determined based on the following:

- Area(s) that will be directly affected by the Project or activity (ie direct area of influence or DAI)
- Wider area which the affected VECs occupy (that is beyond the DAI)
- Distance or range (beyond the DAI) an effect can travel, and other impacts the identified VEC may be exposed to within its range

Hence, the initial spatial boundary of this CIA includes the components as listed out in Table 3.1.

Table 3.1: Initial spatial boundary of CIA

Component	Description
Project area	The area that is directly affected by the Project and its components. Components include WTGs, offshore and onshore substations and cables (see Section 1.4).
Other offshore windfarms	Neighbouring offshore windfarms located in the coast of Miaoli County that directly affect the VECs of the Project. Other windfarms include developments by other developers awarded

[7] IFC Good Practice Handbook: Cumulative Impact Assessment and Management, 2013

Component	Description
	licensed areas by the Taiwanese Ministry of Economic Affairs (MOEA). More elaboration on the offshore windfarms scoped within this CIA is provided in Section 4.3 below. The offshore windfarms scoped within the spatial boundary of this CIA are delineated into four tiers based on the windfarm's developmental status (see Section 4.3). ● Tier 1 projects which are fully operational. As Tier 1 projects are operational, only the operational phase of these projects will be factored in this CIA as appropriate. – Formosa 1 (Haiyang Zhunan) offshore windfarm – Formosa 2 (Haineng) offshore windfarm ● Tier 2 projects which are currently under construction/ pre-construction phase – There are no tier 2 projects within Miaoli County ● Tier 3a projects which have been awarded development permission and signed administrative contract in round 3.1 auction, including: – Formosa 4 (Haisheng) offshore windfarm – the Project ● Tier 3b projects which have been awarded development permission in round 3.2 auction[8]. These projects aim to have a grid connection between 2028 to 2029. Hence, it is reasonable to assume construction periods to indicatively span from 2026 to 2028. Due to the timeline of tier 3b projects, there is a likelihood of temporal overlap with the Project's construction phase. As such, both construction and operational phase of Tier 3b projects within the CIA spatial boundary are considered in this CIA. – Deshuai offshore windfarm Details of each windfarm's tier and life cycle can be found in Table 4.5. These windfarms (except Deshuai offshore windfarm as explained below) are confirmed to hold spatial capacity within the project area and hence are considered within this CIA's spatial boundary. For Deshuai offshore windfarm, it is noted that MOEA has issued a letter to the developer of Deshuai offshore windfarm on 21 May 2025 to revoke the development rights. However, reference to Deshuai offshore windfarm has not been removed in this CIA assessment. More information can be found in the scope and limitations' section of this CIA in Section 1.2.2.

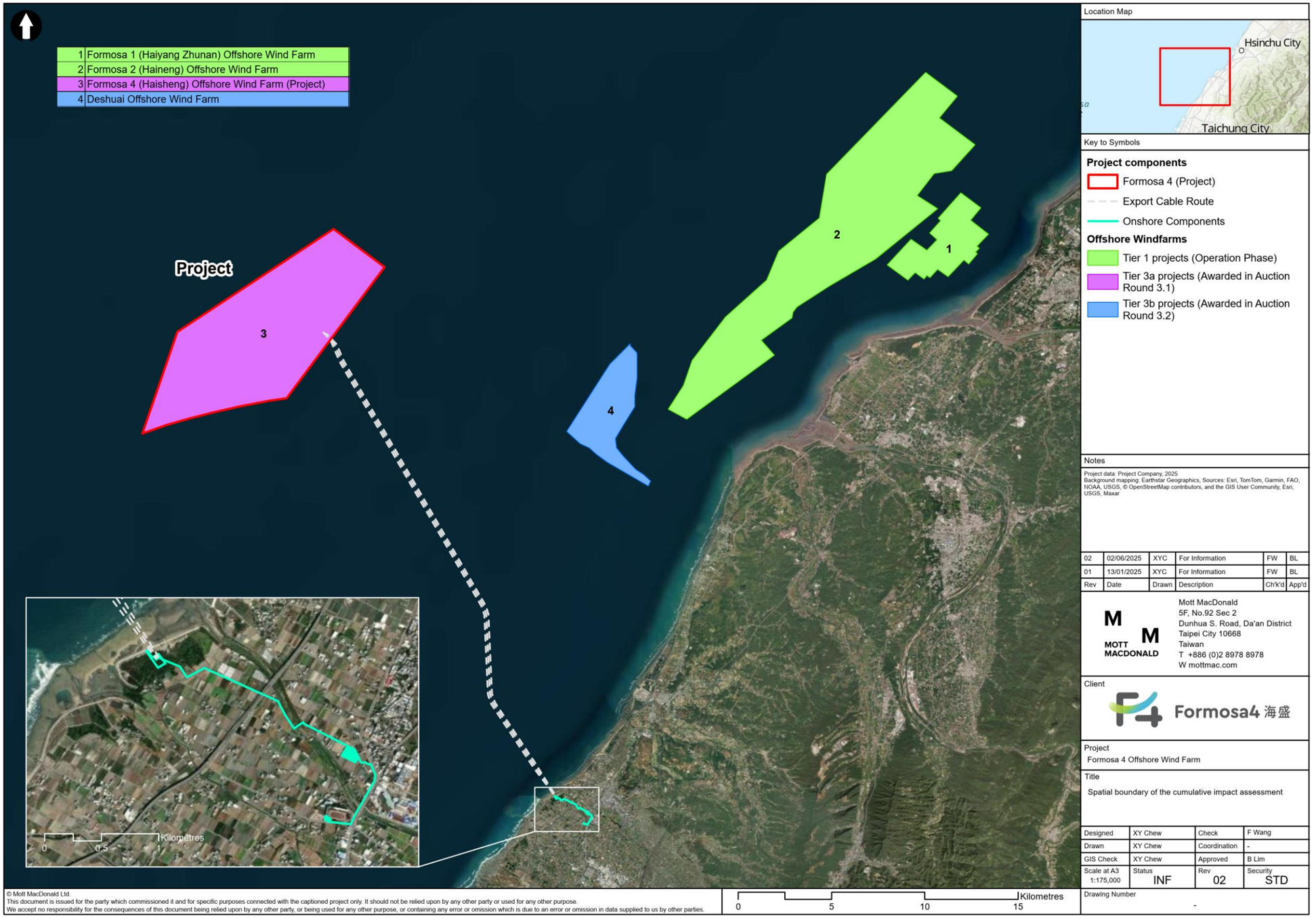
Source: Mott MacDonald, 2025

As elaborated in Section 1.2.2, other coastal developments such as ports and pipeline projects have been scoped out of this CIA. There is a proposed pipeline project with potential spatial overlap with the Project, but this has been scoped out of the CIA due to uncertainty of development/schedule, as well as the likelihood of significant cumulative impact. The justification for scoping out the pipeline project is provided in Section 3.3 below.

Figure 3.1 depicts the spatial boundary considered in the assessment of this CIA.

[8] The signing of administrative contract had yet to be completed

Figure 3.1: Spatial boundary of the cumulative impact assessment



Source: Mott MacDonald, 2025

3.3 Temporal boundary

The temporal boundary of this CIA factors in the limits of the approach as described above in Section 1.2.2, which scopes out other coastal development types. Furthermore, available information of the Project and public information of other surrounding offshore windfarm developments, as well as guidance from the IFC CIA handbook were taken into consideration.

The temporal scale of this CIA includes the following:

- Full lifecycle of the Project
  - Construction phase (ie COD is targeted to be in Q2 2029)
  - Operation phase (ie 20 years, up till 2049)

Given the uncertainty surrounding baseline conditions at the time of future decommissioning, the decommissioning phase is scoped out of this CIA. As such, the temporal boundary of this CIA covers up to the calendar year 2049, before the decommissioning phase.

It is worth noting that the Project is likely to have a temporal overlap with the construction phase of Deshuai offshore windfarm throughout 2026 to 2027. From Deshuai's EIA report, the construction period is expected to last approximately two years. As based on currently known information, the expected grid connection for Deshuai offshore windfarm is in 2028.

There is also another offshore development that could have a temporal and spatial overlap with the Project, which is the proposed Yongan-Tongxiao Gas Pipeline 2 project by CPC Corporation[9]. According to the EIA report for this project[10], the natural gas pipeline runs from Yongan District in Kaohsiung City to Tongxiao Township in Miaoli County, along the western coast of Taiwan. The pipeline near Miaoli County will likely overlap with Formosa 4's export cables. The proposed pipeline project is planned to start construction in 2027, with a target operation in 2030. However, the potential for cumulative impact between Formosa 4 and the pipeline project is likely to be quite low due to the following reasons:

- It is unclear whether the Yongan-Tongxiao Gas Pipeline 2 project is confirmed to be constructed as based on currently known publicly available information
- Even though there will be an overlap in both projects' offshore footprint (ie cables), both projects would need to be doing cable laying works in the same area and at the same time for there to be a significant cumulative impact. The likelihood of this happening would be quite low. In addition, the timing of the cable laying works can be further coordinated between the Project and the pipeline project to stagger the cable laying works.

[9] Taiwan's state-owned petroleum, natural gas and gasoline company

[10] Yongan-Tongxiao Gas Pipeline 2 EIA report (永安至通霄第二條海底輸氣管線興建計畫環境影響說明書), dated 2023

4 Step 2: Identification of VECs and existing and foreseeable future developments

4.1 Overview

The concept of VECs is introduced by the IFC CIA Handbook (IFC, 2013). VECs are environmental and social attributes that are considered to be important in assessing project risks and can include physical characteristics, habitats, wild animal populations; ecosystem services; natural processes; social conditions; and cultural aspects. Consistent with the IFC CIA Handbook guidance, this CIA focuses on VECs recognised as important on the basis of governmental regulation, scientific concerns and concerns from stakeholders.

4.2 Step 2a: Identification of VECs

The identification of relevant VECs for which cumulative impacts have been assessed was done in two phases:

- Identification of potential VECs of relevance for this CIA (preliminary VECs)
- Identification of VECs of relevance for this CIA (applicable VECs)

The results of the activities undertaken during these two phases are presented in the subsections below.

4.2.1 Stakeholder engagement activities and consultations

As mentioned above, the documents reviewed for this CIA include approved local EIA reports which underwent a series of reviews and appraisals in terms of the physical, ecological and socio-economic aspects. These reports include stakeholder engagement activities and public consultations as well as EIA appraisals and reviews, which are presented in in Table 4.1 below.

It is noted that questionnaires were sent out to local residents and fisher folks as well as key informants between 5 to 20 March 2022.

Since the EIA stages, various stakeholders have been engaged. These stakeholders include individuals and representatives from government authorities, local government and communities from Miaoli County, non-governmental organisations (NGOs), academia and state-owned companies. It is understood that the landing point (which was originally planned to be in either in Zhunan or Tongxiao Township in the EIA report) has now been revised to be in Yuanli Township instead as per the EDR report. As such, relevant stakeholders from Yuanli Township have also been engaged.

Table 4.1: Public consultation meetings undertaken for the Project

Event	Date
Online publication of Project information on EIA website for 20 days	22 September 2020
EIA Public Hearing at Xinpu community centre	6 November 2020
Public opinion surveys to community for EIA	5 to 20 March 2022
Online publication of Project information on EIA website for 20 days	16 March 2022
EIA Public Hearing at Lixian Pingan community centre	26 April 2022

Event	Date
F4 Sea Cable Survey Phase 1 Public Hearing	13 June 2023
Public opinion surveys to community for EDA	17 to 18 June 2023
F4 Sea Cable Survey Phase 2 Public Hearing	26 July 2023
F4 Sea Cable Landing Area Coordination Meeting Explanation	25 August 2023
Public opinion surveys to community for EDA	16 to 17 September 2023

Source: Project Company, 2025

For the purpose of the Project, socioeconomic baseline surveys will be conducted. These surveys include key informant interviews (KIIs), focus group discussions (FGDs) and also household surveys, which have been completed between March to April 2025 on project affected communities. Relevant primary survey results will be included to inform the CIA baseline conditions of the socioeconomic VECs, and other possible social impacts. Further socio-economic information can be found in the full human rights impact assessment (HRIA), livelihood restoration plan (LRP), and focused social impact assessment (FSIA) respectively.

4.2.2 Preliminary VECs

Considering the concept of VECs introduced by the IFC CIA Handbook, this CIA initially gathered the potential VECs of concern. VECs known or expected to be affected by Taiwanese offshore windfarm projects include:

- Marine fauna (marine mammals and elasmobranchii[11])
- Offshore ornithology (migratory birds and seabirds at sea)
- Fisheries access and movement
- Local communities residing near the project area

Regarding concerns from affected communities, it should be noted that there was no site visit or interviews/ stakeholder engagements undertaken as part of this CIA to determine the stakeholders' opinions on the present condition of the VECs. This assessment has relied on publicly available database (ie the approved EIAs and deviation reports) containing typical issues common in the area. It was determined that this available database provides ample information and has already undergone consultations, EIA appraisals and reviews. In view of this, this database was considered an appropriate source of information to identify the main concerns expressed by affected local community (including fisher folks and local residents).

The Project's EIA was also reviewed to identify which VECs were previously considered by specialists to be affected by project impacts. The VECs identified are preliminary VECs, which are shortlisted after a review of the Project's EIA and selected review of neighbouring offshore windfarms' EIAs (ie Formosa 1, Formosa 2, and Deshuai OWF). The preliminary VECs for this CIA are presented in Table 4.2 below.

Table 4.2: Preliminary VECs

Biodiversity	Environmental	Socio-economic
● Marine habitats ● Marine flora and fauna – Mammals, fish, reptiles, invertebrates and plants ● Migratory birds (including seabirds at sea) ● Terrestrial habitats	● Marine water quality – Seawater ● Air quality ● Noise and vibration ● Traffic ● Underwater noise	● Community, health, and safety – Hazardous materials – Communicable diseases ● Community livelihood: fisheries resources and zones ● Land use and local property owners ● Cultural heritage

[11] Elasmobranchii is a subclass of cartilaginous fish, which includes sharks, rays, skates, and sawfish.

Biodiversity	Environmental	Socio-economic
● Terrestrial flora and fauna – Mammals, reptiles, amphibians and plants – Terrestrial birds	● Waste	● Workers' influx ● Community daily routine and quality of life ● Public and private services and facilities

Source: Mott MacDonald, 2025

4.2.3 Applicable VECs

Based on the shortlisted preliminary VECs, an analysis of readily available information on baseline conditions of the VECs and on the Project's aspects and impacts were undertaken to conclude which VECs are applicable for this CIA. The applicable VECs address the following criteria:

- Potential to be affected by the Project in some or all phases (construction and operation)
- Identified as already under pressure by other developments and the Project will promote additional stress
- Identified as sensitive according to professional judgment, legal requirements (laws and directives) and stakeholder's opinion
- Existing natural or social stressors if any

Preliminary VECs within Section 4.2.2 that are not listed below are scoped out (ie not selected as applicable VECs). This is because they do not meet the above criteria or are already deemed to have minor to negligible impact as indicated within publicly sourced Project EIAs and EIAs of nearby offshore windfarms. 'Applicable VECs' are intended to be considered as priority for focus. The principle of the CIA is to prioritise the assessment on key VECs where there is a potential for material cumulative impacts, resulting in a concern for the Project.

The justification for scoping out several preliminary VECs is included in Table 4.3 below.

Table 4.3: Justification for scoping out of preliminary VECs

VEC	Justification
Biodiversity	
Terrestrial habitats	These onshore VECs are expected to be primarily impacted by the Project's onshore components (and associated activities). The Project's main components (ie the WTGs and submarine cables) are far from the coast (ie approximately 20km away) and therefore the onshore VECs are unlikely to be impacted by the offshore construction and operation activities directly. It is noted that the onshore activities associated with the Project's onshore components (ie onshore substation, cable laying construction) are not likely to cause significant impacts. The cumulative potential of the Project's terrestrial activities with other offshore windfarm developments is also likely to be not significant. Hence, 'terrestrial habitats' and 'terrestrial flora and fauna' are scoped out for this CIA.
Terrestrial flora and fauna ● Mammals, reptiles, amphibians and plants ● Terrestrial birds	
Environmental	
Marine water quality ● Seawater	These preliminary environmental VECs shortlisted in Section 4.2.2 are scoped out as based on the review of the Project's EIA and neighbouring offshore windfarm EIAs in Miaoli County, these VECs are deemed to have either a slight or no significant impact. Thus, 'marine water quality', 'air quality', 'noise and vibration', and 'traffic' are scoped out of this CIA. However, there may be some potential impacts of water quality degradation on marine fauna/ habitats. This will be further discussed as one of the aspects under 'marine flora and fauna' VEC.
Air quality	
Noise and vibration	
Traffic (excluding marine traffic)	

VEC	Justification
	For marine traffic, the biodiversity and socio-economic aspects are covered under the 'marine flora and fauna' VEC and also 'community livelihood: fisheries resources and zones' VEC respectively.
Underwater noise	During the construction phase, offshore trenching, dredging, foundation installation activities and the use of construction vessels will generate underwater noise. In particular, the underwater noise from piling works for foundation installation have the potential for direct and cumulative impact on marine fauna. It is also noted that Deshuai OWF has a potential temporal overlap in construction phase with the Project. Although Deshuai OWF is located more than 10km away from the Project, it is possible for cumulative impacts to occur under certain circumstances (eg unmitigated underwater noise, concurrent piling in the two OWFs). However, it is noted that there are (EIA prescribed) mitigation measures in place as well as further possible measure to avoid/ reduce the cumulative potential on underwater noise from the Project and Deshuai OWF during construction. Noting the above, underwater noise is further discussed as one of the aspects/ activities under 'marine flora and fauna' VEC.
Waste	During the construction and operation phase, the main waste produced will be domestic waste from the workers. According to the Project's EIA, the maximum number of construction workers at the same time is 90. The waste generated from domestic waste is considered to be not significant. Other major construction waste such as earthworks will be disposed of according to the earthwork construction management. However, waste could be of concern during the decommissioning phase. This is due to the large amounts of waste generated from the removal of the WTGs, foundations and other structures. However, as the decommissioning phase is scoped out of the temporal boundary of this CIA, waste is scoped out as a VEC for this CIA.
Socio-economic	
Community, health, and safety ● Hazardous materials ● Communicable diseases	For the construction phase, the onshore works (eg substation and cable laying construction) is expected to mainly be allocated to contractors with a local workforce, while offshore accommodations will be on-board working vessels. Within the Project's proximity (ie based on offshore working areas and onshore works), there is only three other offshore windfarm projects identified. Out of the three other offshore windfarm projects, two of the projects are Tier 1 projects which are already operational. For operational projects, the activity levels as well as corresponding levels of required workers are expected to be very low. The other project is a Tier 3b project (Deshuai offshore windfarm) which could have potential temporal overlap in 2026 to 2027 with the Project during the construction phase and share similar workers' influx areas. This is based on the assumption that the construction period will be two years[12] prior to grid connection, with the expected grid connection for Deshuai offshore windfarm in 2028. ● It is understood, in terms of workers/ contractor deployment, OWFs in Taiwan to date employ similar arrangements. This is whereby for offshore works, specialised offshore working vessels will have workers' accommodations on-board. Onshore works (eg substation and cable laying construction) is expected to mainly be allocated to contractors with a local workforce, and no onshore worker's camps are expected to be built. ● During the construction phase, most of the working vessels would be mainly for the Project and perhaps Deshuai, which would be far from coastal zones. It should be noted that these working vessels are mainly transiting through the coastal/ fishing areas en-route to their OWF area. For the construction of the export cables for the Project, the working vessels would be in the coastal areas. However, both the Project and Deshuai will have different export cable corridors
Workers' influx	
Community daily routine and quality of life	
Public and private services and facilities	

[12] As per the EIA report for Deshuai OWF, the construction period is expected to last for two years

VEC	Justification
	which are expected to be far apart (either 15 or 39km[13]) . During the operational phase, it is expected that there would be minimal impact as there would not be as many working vessels as compared to during the construction phase. ● It should also be noted that Yuanli Township, where most onshore work will occur for these offshore windfarm projects, has a population of 43,446 people, as of December 2024. The maximum influx by the Project (ie during construction), assuming the Project and Deshuai offshore windfarm are to be developed concurrently, is 160 persons for the construction phase according to the respective EIAs. This is a small percentage compared to the existing infrastructure and facilities available supporting the current community. Therefore, at this stage, it is expected that there will not be any significant workers' influx (impact) due to construction mobilisation (ie whether by the Project or the possible neighbouring windfarms) given the fact that no onshore worker's camps/ accommodations are expected for OWF projects. Hence, these VECs are scoped out for this CIA.
Land use and local property owners	Both terrestrial and marine land use of the project components do not overlap with other developments. For the terrestrial elements, land has been acquired by the Project. For the offshore elements, land use permission will be sought from the relevant government entities. Further information on land acquisition and access to marine areas has been presented in Section 1.7 above. For the overlapping of (marine) usage rights, this is associated with the export cable intersecting through the fishery exclusive rights zone. This will be further discussed under the VEC of 'community livelihood: fisheries resources and zones'. No significant cumulative potential regarding land use/ acquisition are expected during the construction and subsequently the operation phase. Thus, this VEC is scoped out for this CIA.
Cultural heritage	The Project's footprint is reported to not overlap with any onshore cultural sites. Thus, impacts to onshore cultural sites are negligible. However, it is noted that there are six underwater cultural sites identified near the Project's offshore site. For identified underwater cultural sites, a security warning zone with a buffer of 25m will be set up to mitigate against any potential construction impacts. Furthermore, for any suspected underwater cultural sites found during construction in future, all related activities will be stopped immediately, and relevant authorities will be notified for handling. As such, it is unlikely that there would be any significant impacts on cultural heritage. Thus, this VEC is scoped out for this CIA.

Source: Mott MacDonald, 2025

Considering the above reasons for scoping out the various preliminary VECs, the applicable VECs for which cumulative impacts will be assessed and managed are listed below in Table 4.4.

Table 4.4: Applicable VECs

Biodiversity	Environmental	Socio-economic
● Marine habitats ● Marine flora and fauna – Mammals, fish, reptiles, invertebrates and plants ● Migratory birds (including seabirds at sea)	N/A	● Community livelihood: fisheries resources and zones

Source: Mott MacDonald, 2025

[13] This is based on the two possible options for the export cable alignment for Deshuai OWF and the proposed respective common corridors for each alignment

4.3 Step 2b: Developments affecting the VECs

The preliminary spatial and temporal boundary of this CIA is defined by employing a modified[14] tiered approach for cumulative impact assessment suggested by Joint Nature Conservation Committee (JNCC) and Natural England[15]. Three main tiers following this approach have been identified:

- **Tier 1:** Developments that are built and operational
- **Tier 2:** Developments under construction
- **Tier 3:** Developments consented/ approved, but construction has yet to commence. This tier is further split into:
  - **Tier 3a:** Developments officially awarded development permission in the Round 3.1 auction
  - **Tier 3b:** Developments officially awarded development permission in the Round 3.2 auction

This tiered approach considers the current offshore developments, including wind energy developments, along the western coast of Taiwan (ie spatial boundary). The result of the second auction of Round 3 Zonal Development (ie Round 3.2 auction) announced on 5 August 2024[16] has also been included, where the Energy Adminstration (EA) selected five developers/ projects. For the purposes of this CIA, only those projects within Tier 1, 2 and 3 that have made information publicly available are included in this assessment.

The existing, planned or reasonably defined developments located within the spatial boundaries of the CIA that could potentially affect the relevant VECs were identified (Step 2). For the core assessment within this CIA, only the offshore windfarms within the proximity of Miaoli County's coastline are scoped in, instead of the full list of all Taiwanese offshore windfarms shown in Figure 1.2. The close proximity of these offshore windfarms to the Project is expected to result in the primary potential for cumulative impacts, for the identified applicable VECs (ie as identified in Table 4.4).

These developments, together with their respective assigned tier category (ie based on the methodology of tier approach for cumulative impact assessment) are summarised in Table 4.5, and Figure 3.1 illustrates the location of these developments.

Table 4.5: Existing, planned or reasonably defined developments scoped in this CIA and their respective assigned tier category

Development	Developer	Project life cycle phase	Tier category
Formosa 1 (Haiyang Zhunan) Offshore Wind Farm	Formosa 1 Wind Power Co., Ltd.	Operational. Fully commissioned (including Phase 1 and Phase 2) in December 2019.	Tier 1
Formosa 2 (Haineng) Offshore Wind Farm	Formosa 2 Wind Power Co., Ltd.	Operational. Fully commissioned in August 2023.	Tier 1

[14] The tier approach for cumulative impact assessment suggested by Joint Nature Conservation Committee (JNCC) and Natural England consist of further tier levels that considers eg application submitted to the appropriate regulatory body that have not yet been determined; regulatory body are expecting an application to be submitted; projects that have been identified in relevant strategic plans or programmes. Due to limited publicly available information, these tiers were omitted from the above consideration.

[15] Scottish Power renewables (2013) JNCC and Natural England Suggested Tiers for Cumulative Impact Assessment

[16] This is updated as based on the known results/ outcomes as of the time of report writing. This takes into account developments which are confirmed to surrender their rights to develop their project, where they are awarded.

Development	Developer	Project life cycle phase	Tier category
Formosa 4 (Haisheng) Offshore Wind Farm (the Project)	Formosa 4 International Investment Co., Ltd	Awarded the Round 3.1 auction. Has not started construction. The grid connection year is expected in 2028.	Tier 3a
Deshuai Offshore Wind Farm[17]	Deshuai Xingdian Co., Ltd.	Awarded the Round 3.2 auction. Has not started construction. The grid connection year is expected in 2028.	Tier 3b

Source: Formosa 4 Project EIA Report, 2023

[17] It is understood that Deshuai offshore windfarm's development rights has been revoked by MOEA as of 21 May 2025. More information can be found in the 'scope and limitations' section of this CIA in Section 1.2.2.

5 Step 3: Baseline conditions of identified VECs

5.1 Overview

This Section presents Step 3 which discusses information on the baseline status of the selected VECs, and aims to describe their current conditions, spatial boundaries and potential response to project-related stressors/ impacts and assess trends. Historical information about the VECs was gathered from various sources and used to assess the baseline conditions.

In this CIA, the presented baseline is limited to information that can be used to assess changes in VEC conditions due to cumulative impacts with other anthropogenic sources of impacts in the spatial and temporal boundaries; which subsequently contributed to the assessment of cumulative impacts (Section 6) and the development of management measures (Section 7).

5.2 Biodiversity VEC

5.2.1 Marine habitat

According to the Copernicus Global Land Service (CGLS) land cover data, the areas within the CIA spatial boundary consists mainly of oceans and seas, which are considered as natural habitats (CGLS, 2019). Along the western strait of Taiwan, there are several types of marine protected area (MPA).

The definition of marine protected area (海洋保護區) in Taiwan according to the Fisheries Agency under the Ministry of Agriculture, refers to “an area extending seaward from mean hightide mark to a certain range, with special natural features, important cultural heritage and sustainable use of ecological resources, protected by law or other effective means”[18]. The marine protected areas are subject to different levels of control, from multifunctional use of the most lenient to most stringent use of no entry. According to the Marine Protected Area (MPA) of Taiwan, there are seven types of marine protected areas, including:

- Fisheries resources conservation zone
- National park
- Wildlife refuge
- Nature reserves and natural monument
- Marine resources protected area
- Important wetland
- Major wildlife habitat

As of January 2025, there are 70 marine protected areas in Taiwan, with a total approximate area of 5401km^2. This accounts for about 8.38% of Taiwan’s offshore borders and domestic water area[19]. Of the 70 marine protected areas in Taiwan, only one MPA directly overlaps with the project components. This MPA is the Taiwanese Humpback Dolphin Major Wildlife Habitat

[18] Fisheries Agency, Ministry of Agriculture (https://en.fa.gov.tw/view.php?theme=Marine_Protection&subtheme=&id=13)

[19] Marine Protected Areas of Taiwan (https://mpa.oca.gov.tw/Default.aspx, accessed January 2025)

(MWH) (中華白海豚野生動物重要棲息環境), which is also considered as a legally protected area in Taiwan[20].

The export cables of the OWFs considered within this CIA will overlap with the Taiwanese Humpback Dolphin MWH. It was identified that the Taiwanese Humpback Dolphin (*Sousa chinensis ssp. taiwanensis*) is an Endangered species under category I in Taiwan[21] and considered as Critically Endangered under the IUCN Red List of Threatened Species[22]. The Taiwanese Humpback Dolphin inhabits a narrow strip of waters off the western coast of Taiwan, between Miaoli County and Jiangjun fishing port of southern Taiwan. The species distribution comprises shallow coastal waters at depths up to 30m, between 2 and 2.5km from the coast (Wang, et al., 2017). The range of the Taiwanese Humpback Dolphin is situated outside of the Project's windfarm array but overlaps the export cable route as well as potential construction and operational vessel routes.

There are currently a total of 30 fisheries resources conservation zone in Taiwan. The Wanwa Venus Clam Breeding Conservation Area (灣瓦海瓜子繁殖保育區) is located 15km northeast of the export cable alignment of the Project. Another designated area of note is the Xihu Important Wetland, which is also located 15km northeast of the export cable alignment of the Project.

The summary of MPAs located in Miaoli County is shown in Table 5.1 below.

Table 5.1: Summary of marine protected areas along Miaoli County coastline

	Taiwanese Humpback Dolphin MWH	**Wanwa Venus Clam Breeding Conservation Area**	**Xihu Important Wetland**
Year of establishment	2020	2010	2015
Area (km^2)	694.35	0.02	1.42
Distance to OWFs	● Overlaps with Project's export cables (approximately 4km overlap) ● Overlaps with Deshuai OWF's for one of the two potential options for export cables (approximately 1.5km overlap)	● Approximately 15km away from the Project's export cables ● Approximately 0.5km away from one of the options for Deshuai's export cables	● Approximately 15km away from the Project's export cables ● Approximately 0.8km from one of the options for Deshuai's export cable

Source: Marine Protected Area of Taiwan (https://mpa.oca.gov.tw/Default.aspx), accessed 13 January 2025

Other than the areas listed above, there are also other areas of note within the vicinity of the CIA spatial boundary such as the protected reef areas[23] (保護礁區), and artificial reef areas[24] (人工魚礁區). There are a total of 89 artificial reef areas and 62 protected reef areas established in Taiwan, with a total of eight artificial reef areas and eight protected reef areas located off the coast of Miaoli County. In particular, the Haikou artificial reef (海口人工魚礁禁漁區) and Tongyuan protection reef (通苑保護礁禁漁區) overlaps with the Project's export cables. Also, one of the options for Deshuai OWF's export cables overlaps with the Xiangshan artificial reef

[20] Formally gazetted with effect from 1 September 2020, as follows: https://gazette.nat.gov.tw/egFront/e_detail.do?metaid=118079

[21] Ocean Affairs Council Notice, Schedule of Protected Marine Species (June 2020), https://gazette.nat.gov.tw/egFront/e_detail.do?metaid=115080

[22] IUCN Red list. https://www.iucnredlist.org/species/133710/122515524

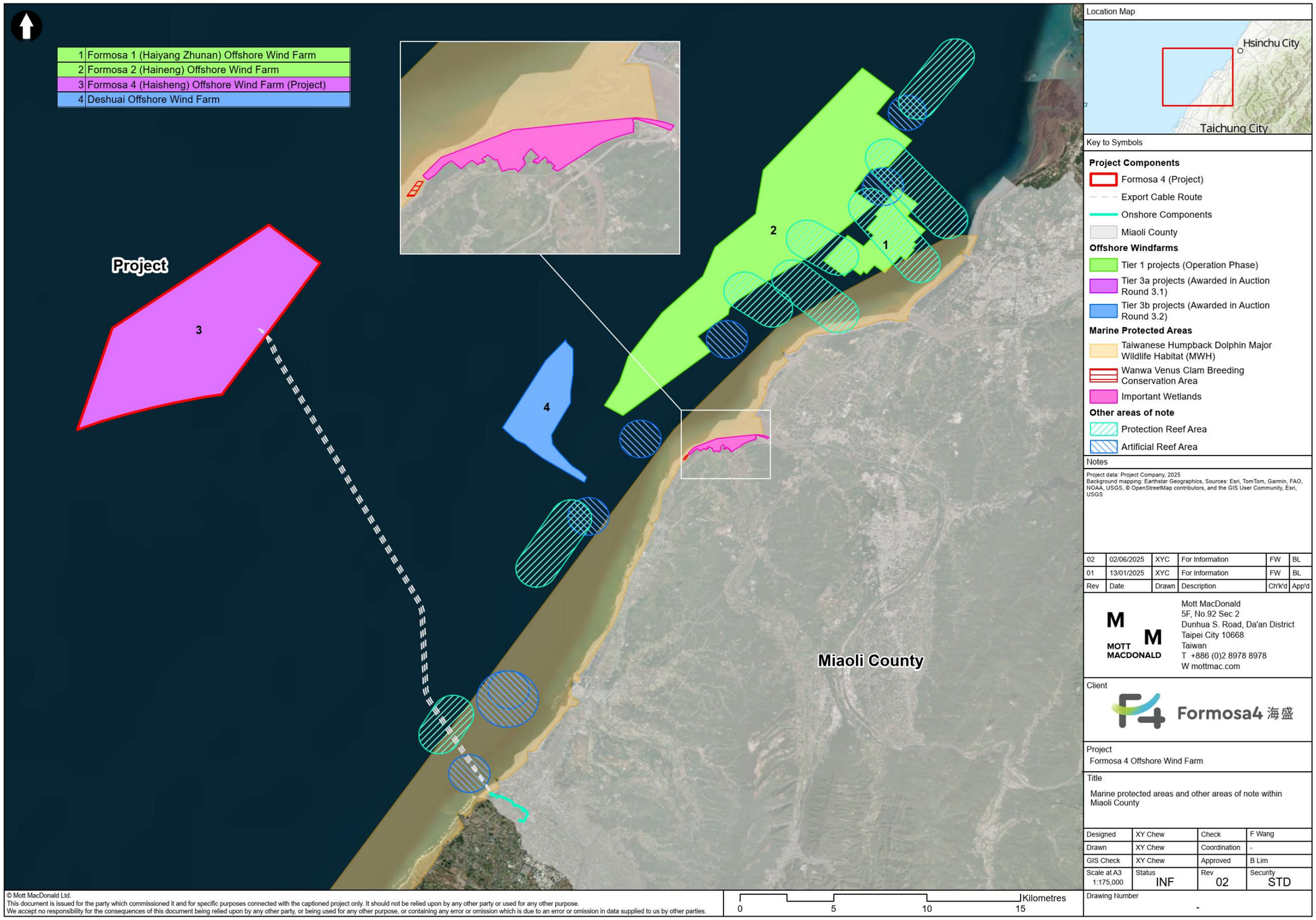
[23] Areas established to protect and conserve fisheries resources.

[24] Man-made structures dropped into the seabed to help recruit and encourage coral reef and fishery resources.

area (香山人工魚礁禁漁區) and Xiangshan protection reef area (香山保護礁禁漁區). These areas have been established to help address the overuse of fisheries resources, as artificial reefs have been recognised for the rebuilding of fishing grounds and enhancement of marine environment. The aim of these areas is to restock fisheries resources and develop complex ecological environments. In artificial reef areas, artificial reef structures (ie concrete structures) have been deployed along the coast to deter illegal trawling activities.

Figure 5.1 shows the marine protected areas and other areas of note along Miaoli County's coastline.

Figure 5.1: Marine protected areas and other areas of note within Miaoli County



Source: Mott MacDonald, 2025

5.2.2 Marine flora and fauna

The baseline conditions of marine flora and fauna within the CIA spatial boundary considers the Project's footprint and the neighbouring offshore windfarms – Formosa 1, Formosa 2 and Deshuai.

During the baseline surveys conducted for the Project's EIA between 2020 to 2021 and 2023, a total of 163 species were found. These species are assigned to the following IUCN conservation status categories:

- Critically endangered (CR): 1
  - Large Yellow Croaker (*Larimichthys crocea*)
- Endangered (EN): 1
  - Threadfin Porgy (*Evynnis cardinalis*)
- Vulnerable (VU): 8
- Near threatened (NT): 8
- Least concern (LC): 96
- Data deficient (DD): 13
- No status[25]: 36

Transect surveys for mammals covering the OWFs were conducted to inform the EIA, where the geospatial coordinates, estimated group size, behaviours and environmental data were collected alongside photographic records for individual identification.

It is noted from the Project's CHA[26] that there is a total of six species of marine flora and fauna identified as critical habitat (CH) species, as listed below:

- Taiwanese Humpback Dolphin (Sousa chinensis ssp. Taiwanensis)
- Taiwanese Wedgefish (Rhynchobatus immaculatus)
- Brown Guitarfish (Rhinobatos schlegelii)
- Ringed Guitarfish (Rhinobatos hynnicephalus)
- Taiwan Picnic Seabream (*Acanthopagrus taiwanensis*)
- Bothus assimilis

5.2.3 Migratory birds (including seabirds at sea)

The baseline conditions of migratory birds (including seabirds at sea) within the CIA spatial boundary considers the project footprint and also the neighbouring offshore windfarms – Formosa 1, Formosa 2 and Deshuai.

Given the proximity of the three other neighbouring offshore windfarms (ie ranging from 12-25km), and the wide-ranging behaviour of migratory birds and seabirds at sea, it is assumed that the species present within the CIA spatial boundary will be largely similar to the species recorded from the Project's EIA. Furthermore, it is noted that the terrestrial bird surveys conducted for the Project's EIA were in Tongxiao and Zhunan Township. These terrestrial bird survey locations are in very close proximity to Formosa 1, Formosa 2 and also Deshuai offshore windfarms. As such, it is possible that the terrestrial bird species present within these three neighbouring offshore windfarms will be largely similar to that from the Project's EIA surveys.

[25] These species are not assessed by the IUCN yet, and thus have been classified as 'no status'.

[26] Project's Critical Habitat Assessment (Final), dated March 2025

During the baseline surveys conducted for the Project's EIA and EDR between 2020 to 2023 for Yuanli, Zhunan and Tongxiao area, a total of 114 species were recorded. These species are assigned to the following IUCN conservation status categories:

- Endangered (EN): 1
  - Siberian Sandplover (*Charadrius mongolus*)
- Vulnerable (VU): 4
  - Javan Myna (Acridotheres javanicus)
  - Chinese Egret (Egretta eulophotes)
  - Grey Plover (Pluvialis squatarola)
  - Sharp-tailed Sandpiper (*Calidris acuminata*)
- Near threatened (NT): 5
- Least concern (LC): 99
- No status[27]: 5

Furthermore, it is noted from the Project's CHA that there are a total of five species of migratory birds (including seabirds at sea) identified as critical habitat (CH) species, as listed below:

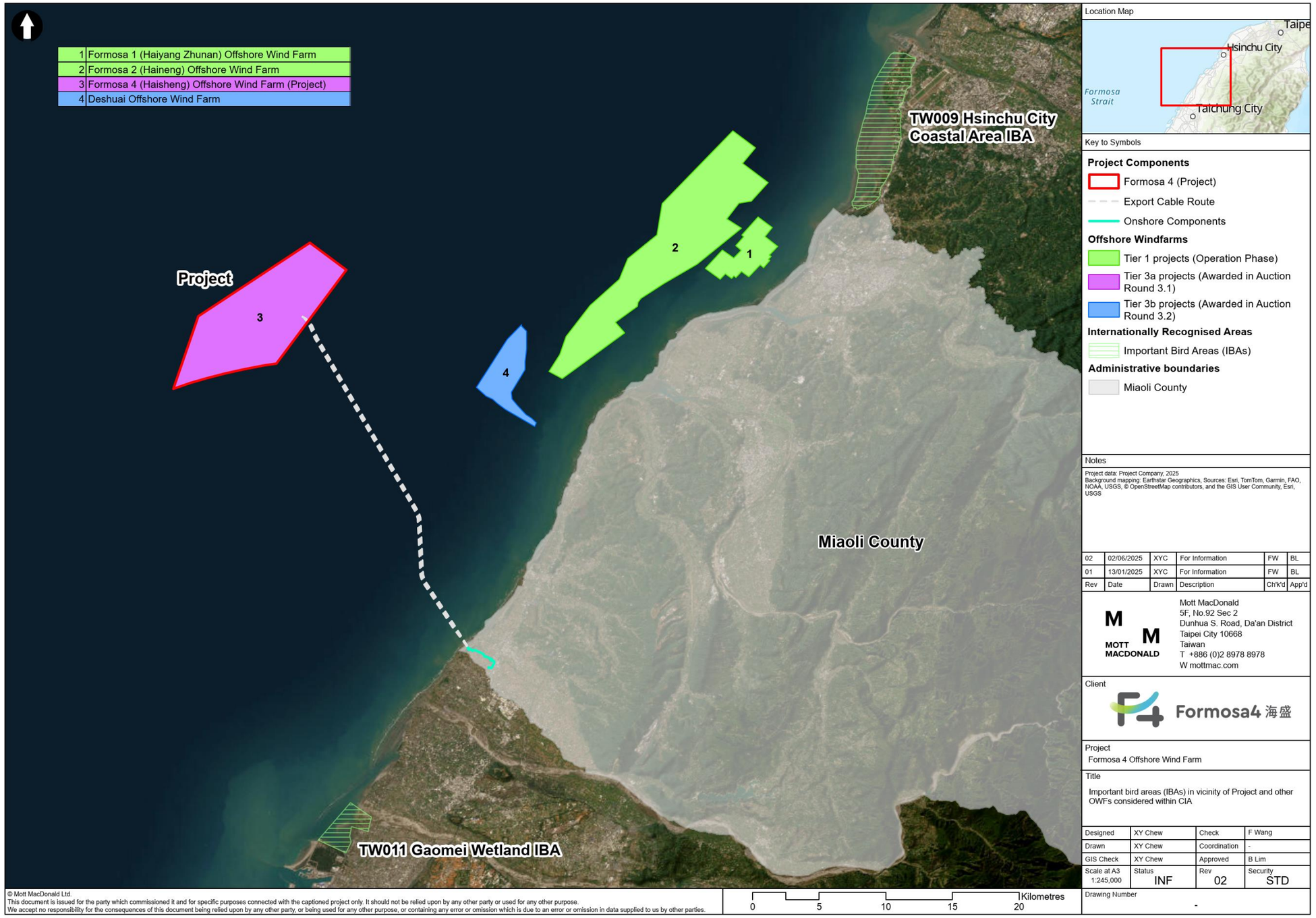
- Black-faced spoonbill (*Platalea minor*)
- Oriental stork (*Ciconia boyciana*)
- Chinese crested tern (*Thalasseus bernsteini*)
- Baer's Pochard (*Aythya baeri*)
- Kentish Plover (*Charadrius alexandrinus*)

It is noted that there are two important bird areas (IBAs) in the vicinity of the CIA spatial boundary, with Gaomei Wetland to the south (approximately 33km to the Project and 30km to Deshuai) and Hsinchu city coastal area to the north-east (approximately 35km to the Project and 6km to Formosa 1 and Formosa 2). These areas are categorised as IBAs due to the high abundance of congregating migratory birds and seabirds utilising these areas as foraging, resting, and breeding grounds.

Figure 5.2 shows the IBAs in the vicinity of the Project and other offshore windfarms considered within the CIA.

[27] These species are not assessed by the IUCN yet, and thus have been classified as 'no status'.

Figure 5.2: Important bird areas (IBAs) in vicinity of Project and other OWFs considered within CIA



Source: Mott MacDonald, 2025

5.3 Socio-economic VEC

5.3.1 Community livelihood: fisheries resources and zones

Affected fishery communities include villages/ townships where affected fisher folks, their workers and households conducting fishing activity, as well as specific fishing ports with associated fish sector value chain workers.

Figure 5.3 presents the spatial boundary considered for the affected fisheries communities. The affected communities as mentioned below are as relevant to the communities potentially impacted by the developments in the region (ie the Project, Deshuai, Formosa 1 and Formosa 2). The actual significance of impact (as well as cumulative potential) and affected communities associated with the Project will be elaborated in subsequent sections (ie see section 6.3).

Figure 5.3 illustrate areas such as:

- Fisheries located in Miaoli County, primarily consisting of fisher folks who are members of Tongyuan Fishermen Association (TFA) and Nanlong Fishermen Association (NFA)[28]. Fisher folks of the TFA have access to the Tongyuan exclusive fishing rights (EFR) zones along Tongyuan coast[29], while fisher folks of the NFA have access to the Nanlong EFR zones coast.
- Fisher folks, workers and their associated household members (who participate/ support in fishery business/ activities), whose fishing operations are based out of the following coastal townships[30]:
  - Yuanli Township (with Yuanli fishing port and Yuangang fishing port)
  - Tongxiao Township (with Tongxiao fishing port, Xinpu fishing port and Baishatun fishing port)
  - Houlong Township (with Nangang fishing port, Funing fishing port, Gongsiliao fishing port and Waipu fishing port)
  - Zhunan Township (with Wunzitou fishing port and Longfung fishing port)

Miaoli County is located on the northern west coast of the mainland island of Taiwan, with an area of approximately 1820km^2. Miaoli County's has a population of 533,063 people as of November 2024, with a population density of approximately 293 persons/km[31].

[28] Fisher folks of NFA are identified due to the presence of Deshuai, Formosa 1 and Formosa 2 offshore wind farm developments located within the Nanlong EFR.

[29] The current administrative management and ownership of Tongyuan EFR now lies with the Fisheries Agency instead of TFA. The mechanisms and practices associated with the EFR area are still materially in place, whereby the fishing rights and regulations associated with it are still considered valid/applicable (eg vessels without fishing rights licenses are still not allowed to operate in the EFR).

[30] It is recognised that there are other coastal townships within Miaoli county. In terms of the projects physical 'onshore footprint', these are limited to the three townships listed. From the aspect of community and economic/livelihood impacts, these are not scoped/based geographically but rather covered through assessment of the affected fisher folks group(s). These are assessed as pertaining to fisher folks within the TFS (ie the primary fisher folks operating within/along Tongyuan) and the home ports of fishing vessels (ie within the above identified townships). Hence, the location of the physical residences of these fisher folks households (ie which could be located in other coastal townships or even inland and/or in Miaoli County) is not considered a material/relevant aspect for assessment associated with economic/livelihood aspects.

[31] Ministry of the Interior, R.O.C. (Taiwan). Bulletin of Interior Statistics. 內政部全球資訊網-中文網-列管統計項目. Accessed 'Land area, village, number of households and current population' on 26 December 2024.

The Directorate-General of Budget, Accounting and Statistics, Executive Yuan of Taiwan conducts a fishery census once every five years. In 2020[32], there was a total of 600 fisher folk households in Miaoli County. The number of Miaoli fisher folk households accounts for 4.4% of all agriculture, forestry, fishery and animal husbandry households in Miaoli County (600 out of 13,596 total households).

In Miaoli County, all Miaoli fisher folks (ie 9574 people) are employed or engaged under coastal fisheries activities (ie full time and part time). None fall under far sea fishing, offshore fishing, inland fishing, marine culture or inland culture. In the household surveys conducted, all the fisher folk are engaged under coastal fisheries activities (up to 12 nautical miles (NM) from the coast). Two (2) households noted their maximum distance from shore to conduct fishing activities was 12 NM and 15 NM, indicating some offshore fishing activities are conducted.

The fishing fleet by type, size and tonnage in Miaoli County are provided in Table 5.2 as of 2023. Fishing boats CTS, CTY, CTX, CTR are those that operate only in coastal seas. The other fishing boats/ vessels (ie CT0, CT1, CT2 and CT3) operate in coastal seas as well as potentially up to offshore seas area[33].

Table 5.2: Fishing fleet operating in Miaoli County by size

Fishing boat/ vessels	Miaoli County total
Powered sampan[34] (CTS, 動力舢舨)	117
Non-powered rafts (CTY, 無動力漁筏)	2
Non-powered sampans (CTX, 無動力舢舨)	1
Powered rafts (CTR, 動力漁筏)	549
Powered fishing crafts (動力漁船) below five tonnes (CT0)	50
Powered fishing crafts over five tonnes to under 10 tonnes (CT1)	4
Powered fishing crafts over 10 tonnes to under 20 tonnes (CT2)	7
Powered fishing crafts over 20 tonnes to under 50 tonnes (CT3)	2
Total	**732**

Source: Fisheries Agency, 2023[35]

The Project has confirmed that the Project's cable laying area is not in proximity to any oyster farm areas. Aquaculture farmers (海面養殖漁戶) are also scoped out as key stakeholders. This is because based on the Fisheries Agency Statistical Annual Report for 2023, Miaoli County does not have any registered (offshore) aquaculture farmers, and no quantity of (offshore) aquaculture production. Thus, they are not an existing affected group within Miaoli County. Although there are inland culture farms (內陸養殖) found on the coast near Tongxiao fishing port and Yuanggang fishing port, inland culture farmers are scoped out as stakeholders for the following reasons:

- Inland culture farms in Miaoli County are not in proximity to the Project footprint
- Households identifying aquaculture as part of their work status are not present in Yuanli Township, where the Project's landing point and onshore footprint are located

[32] National Statistics, R.O.C. (Taiwan) (June 2023). 2020 Census Report on Agriculture, Forestry, Fisheries and Animal Husbandry. 109 年農林漁牧業普查綜合報告.pdf. Accessed page 17 on 26 December 2024. The next census will be conducted in 2025.

[33] Marine Bureau, Kaohsiung City Government. Vessel types. 海洋局-船筏種類 (kcg.gov.tw).海洋局-船筏種類 (kcg.gov.tw). Accessed 26 December 2024.

[34] A small wooden, canoe-like boat typically propelled by oars

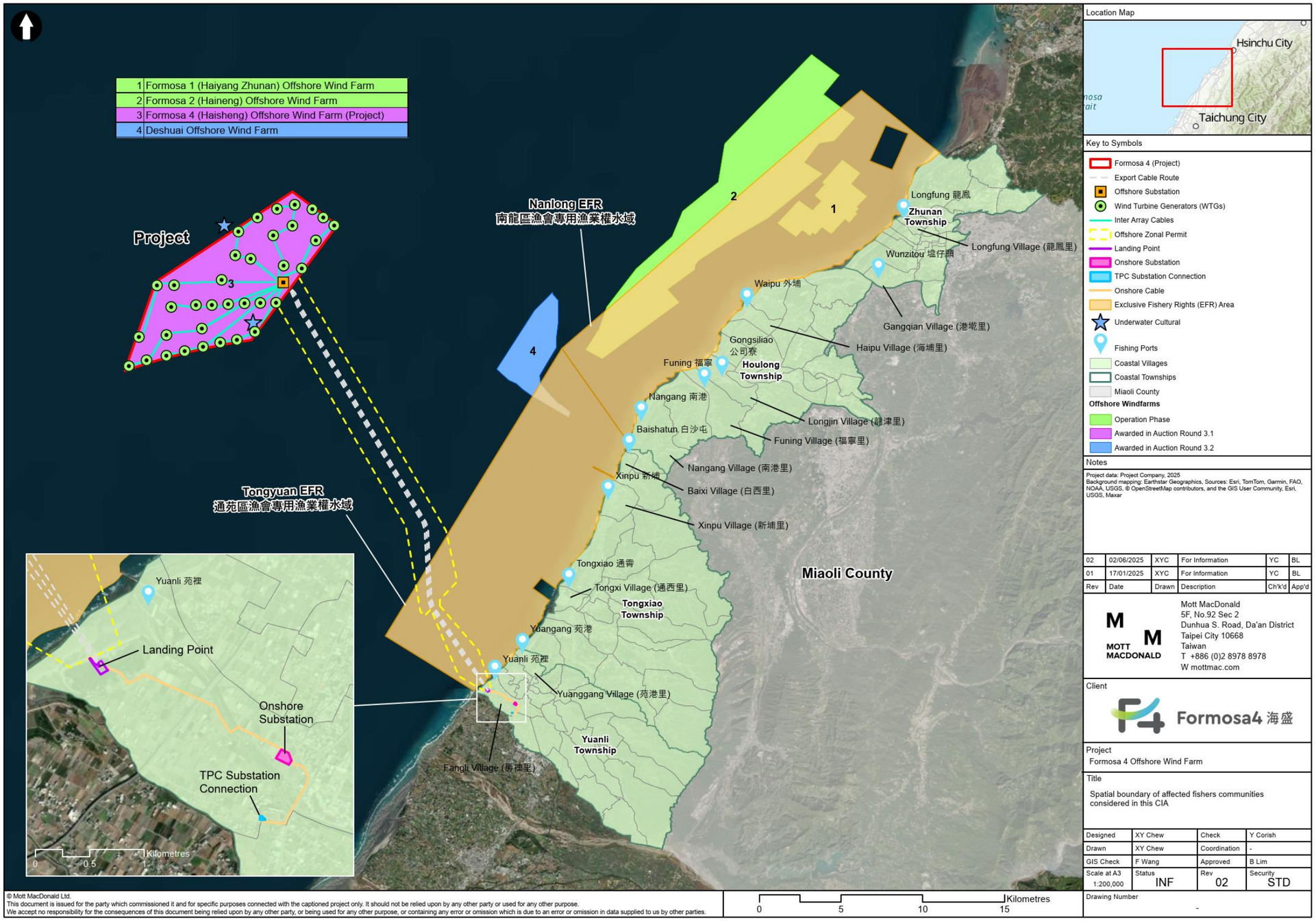
[35] Fisheries Agency. 2023 Fishery industry statistics annual report (fa.gov.tw). Accessed '6. Fisheries Boats and Vessels Statistics' on 26 December 2024.

- Inland culture farms in Miaoli County utilise freshwater ponds, and considering the distance from the Project footprint, these farms are not expected to be impacted by offshore works

Where any scoped out stakeholders are encountered during further site surveys and stakeholder engagements conducted by the Project Company, these assumptions will be revisited.

Vulnerable groups may be present within the project area's fishing communities. Fisher folks households may be considered vulnerable due to their gender, age, physical or mental disability, or disadvantaged by their economic or social status. The presence of these vulnerable groups within the fishing communities will be verified during consultations and assessment as part of the Project's human rights impact assessment (HRIA) and livelihood restoration plan (LRP). Within the CIA, the assessment will be based on the impacts to the fisher folks' livelihoods. The assessment as relating to vulnerable groups within the fishing communities is not considered a priority issue for detailed discussion within this report as based on the CIA approach.

Figure 5.3: Spatial boundary of affected fisher folks communities considered in this CIA



Source: Mott MacDonald, 2025

6 Steps 4 and 5: Cumulative impacts and significance

6.1 Overview

This section presents steps 4 and 5 which assesses future conditions of the selected VECs, as a result of cumulative impacts of the Project with other developments within spatial and temporal boundaries as defined in Section 3. This section describes the key potential impacts that could affect the long-term sustainability of the VECs, if these impacts interact with each other, and also determines the significance of impacts based on qualitative analysis to verify if cumulative changes are a concern.

In a CIA, the impacts are measured in terms of the VEC response and, ultimately, any significant changes to its condition (VEC-centred perspective); not in terms of the intensity of the stress added by a given development (Project-centred perspective). Hence, this CIA focuses on estimating the future condition of VECs due to cumulative impacts and in determining the significance of the forecasted change in the VECs condition based on the likelihood that a threshold will be reached and exceeded. This likelihood for change is due to the incremental (cumulative) impact and in terms of the vulnerability and/or risk to the sustainability of the VECs assessed. In the absence of defined thresholds or in the face of an inability to determine limits of acceptable change, and based on available scientific evidence, professional judgment was employed to suggest appropriate[36] thresholds or limits.

Where possible, incremental change is represented by endpoints or indicators as recommended in the IFC CIA Handbook, using as reference the Appendix 1 in said document[37]. Relevant indicators of cumulative impact for respective VECs are shown in Table 6.1.

Table 6.1: Cumulative impact indicators for respective VECs and the associated impacts

VEC	Phase of Project	Indicator of cumulative impact	Potential impacts identified
Marine habitat	Construction	Habitat fragmentation or disturbance	Disturbance effect from construction activities
	Operation	Area of habitat loss	Project footprint falls permanently into sensitive marine habitat
Marine flora and fauna	Construction	Change in / displacement of marine flora/fauna population	● Project footprint causes permanent loss/change in the habitat of marine fauna ● Underwater noise impacts to marine fauna ● Increased marine traffic and the associated risk of collision with construction vessels ● Water quality degradation due to sediment suspension
	Operation	Change in / displacement of marine flora/ fauna population	● Underwater noise impacts to marine fauna ● Risk of collision with maintenance vessels ● Effect of electromagnetic field (EMF)

[36] A precautionary approach considering uncertainty was assumed when thresholds were being suggested.

[37] Appendix 1 of the IFC CIA handbook provides examples of endpoints or indicators typically used on standard ESIAs vis-á-vis those that would be recommended or used in a CIA.

VEC	Phase of Project	Indicator of cumulative impact	Potential impacts identified
		Creation of artificial habitats through WTG foundations	Project footprint produces new habitats for marine fauna
Migratory birds (including seabirds at sea)	Operation	Change in migratory/ sea bird population	Collision with wind turbine blades and barrier effect
		Behavioural change of migratory birds (including seabirds)	Barrier effect
Community livelihood: fisheries resources and zones	Construction	Shifts in livelihoods	● Reduction of fisheries resources ● Increased marine traffic
	Operation	Shifts in livelihoods	● Reduction of fisheries resources ● Risk of collision with maintenance vessels

Source: Mott MacDonald, 2025

In broad terms, significance can be characterised as the product of the degree of change predicted (the magnitude of impact) and the value of the receptor/ resource that is subjected to that change (sensitivity of receptor). For each impact the likely magnitude and the sensitivity of the receptor are defined. Generic criteria for the definition of magnitude and sensitivity are summarised below.

Impact magnitude (Table 6.3) will be categorised as major, moderate, minor or negligible based on consideration of the parameters such as:

- Duration of the impact (Table 6.2)
- Spatial extent of the impact
- Likelihood
- Compliance with legal standards and Good International Industry Practice (GIIP)

The impact magnitude criteria is defined in Table 6.3. Sensitivity is specific to each VEC and is defined in Table 6.4.

Table 6.2: Criteria for temporal scale

Assessment criteria		Definition
Duration (period of the event causing the effect)	Short term	Impacts occur during the extent of preconstruction and construction through to project commissioning
	Medium term	Impacts occur during the first 10 years of operations
	Long term	Impacts extending greater than 10 years, over the life of the Project and beyond

Source: Mott MacDonald, 2025

Table 6.3: Criteria for magnitude of impact

Magnitude	Definition
Major	● Fundamental change to the specific conditions assessed resulting in long term or permanent change, typically widespread in nature and requiring significant intervention to return to baseline ● Would violate national standards or Good International Industry Practice (GIIP) without mitigation ● Impacts has a net loss or is a detriment to biophysical or socio-economic conditions
Moderate	Detectable change to the specific conditions assessed resulting in non-fundamental temporary or permanent change
Minor	Detectable but small change to the specific conditions assessed
Negligible	● No perceptible change to the specific conditions assessed

Magnitude	Definition
	• Impacts has no net benefit or loss to biophysical or socio-economic conditions.

Source: Mott MacDonald, 2025

Table 6.4: Sensitivity criteria

Sensitivity	Criteria
Sensitive	Receptor (human, physical or biological) with little or no capacity to absorb proposed changes and/or minimal opportunities for mitigation. For example, critically endangered species and their supporting habitats within protected areas.
Not sensitive	Receptor with capacity to absorb proposed changes and/or good opportunities for mitigation. For example, widespread Vulnerable species and natural habitats that can be restored in the short term.

Source: Mott MacDonald, 2025

The resultant impact significance is shown in Table 6.5 below.

Table 6.5: Impact significance matrix

		Impact magnitude			
		Major	Moderate	Minor	Negligible
Sensitivity	Sensitive	Significant	Significant	Not significant	Not significant
	Not sensitive	Significant	Not significant	Not significant	Not significant

Source: Mott MacDonald, 2025

6.2 Biodiversity VEC

6.2.1 Marine habitat

The cumulative impacts of the Project with other existing/ foreseeable offshore windfarms within the study area of this VEC are mainly related to habitat disturbance and fragmentation due to construction activities.

6.2.1.1 Construction phase

As Formosa 1 and Formosa 2 are already operational, there will not be any cumulative construction phase impacts with the Project. The construction phase impacts will be mainly from the Project itself, as well as Deshuai OWF, which is expected to have an overlap in construction phase with the Project for two years in 2026 and 2027.

Construction activities could cause habitat disturbance, or even habitat fragmentation if the impact magnitude is large. Construction activities which may generate noise such as noise from construction vessels, which may potentially cause behavioural changes such as temporary loss of feeding/ breeding habitats. This will then lead to habitat displacement.

The impacts from construction activities such as the laying of submarine cables, WTG and offshore substation installation is further elaborated below.

Impacts from laying of submarine cables

Submarine cables from the offshore windfarms within the CIA spatial boundary (ie Project and Deshuai) will overlap with the Taiwanese Humpback Dolphin MWH at the coastal area of northwest to western Taiwan.

The Project is designed to have two export submarine cables along a single export cable alignment leading to the landing point in Fangli Village, Yuanli Township. These cables each have an approximate length of 27km from the offshore substation to the landing point, and

about 4km of these cables will overlap with the Taiwanese Humpback Dolphin MWH. For Deshuai OWF, there are two options for the export submarine cable, with both options having an approximate 4km overlap with the Taiwanese Humpback Dolphin MWH. The conservative estimate of the cable trench width from the Project's EIA report and Deshuai's EIA report is 1m and 2m respectively.

The Taiwanese Humpback Dolphin MWH is defined to have an area of 694km^2. The total area in which the Project and Deshuai OWF's export cable alignment will overlap with the Taiwanese Humpback Dolphin MWH is 0.016km^2. This is equivalent to 0.002% of the total Taiwanese Humpback Dolphin MWH area.

While the construction activities for these submarine cables along the Taiwanese Humpback Dolphin MWH could cause a moderate disturbance impact, this impact is expected to be temporary and localised (ie short period of disturbance within small portion of the overall habitat area). The offshore construction for the Project is expected to last a total of 34 months (Q2 2026 to Q4 2028), but for the offshore cable laying works, it is expected to be within a much shorter period (less than a year). At the time of writing, it is unknown what the expected duration and timeframe will be for the offshore construction of Deshuai OWF.

However, measures have been undertaken to minimise the impact of laying the submarine cables. A cable corridor[38] for cable installation has been designated (ie Fangli common corridor (房裡共同廊道)[39]) which can help to minimise the disturbance to marine habitats, such as the Taiwanese Humpback Dolphin MWH. It is noted that there are currently no other known OWFs within the vicinity that will also be utilising the Fangli common corridor, as Deshuai OWF will be utilising another common corridor instead. However, there could be other projects utilising this common corridor in the future. The common corridor design helps to minimise the extent of submarine cable construction for individual offshore windfarm projects, by arranging the cables in an array. This will in turn minimise the associated impact of habitat disturbance and fragmentation on marine habitats, such as the Taiwanese Humpback Dolphin MWH, and also marine benthic and intertidal habitat loss.

It is worth noting that the export cable alignment of the Project and Deshuai OWF will overlap with some of the artificial reef area and protection reef areas off the coast of Miaoli County respectively, as mentioned in Section 5.2.1 above. Furthermore, the Fangli common corridor also extensively overlaps with the Haikou artificial reef area (海口人工魚礁禁漁區). As based on the Project's EDR and official letters from the Miaoli County government regarding the overlap of the Project's export cables with the reef areas[40], the Project is required to ensure that the export cables avoid the reef structures that are already present within the reef area.

Therefore, the spatial and temporal impact of the cable laying works during construction of the Project and Deshuai OWF is expected to be minor. There will only be temporary disturbance to marine habitats for short sections of the cable route. The aggregated extent of possible overlap on a conservative basis will just be from the Project and Deshuai. However, these two projects are expected to have export cable alignments quite far away from each other and will be utilising different common corridors.

Impacts from WTG and offshore substation installation

Permanent habitat loss will occur from the construction of WTGs and offshore substations. However, this loss is outside the key marine habitat of concern considered within this CIA – the

[38] A common corridor is a state-designated area for offshore wind power block development

[39] Taiwan Power Company (9 November 2023). Offshore windfarm development common corridors 台灣電力公司-離岸風電開發相關公告-公告「離岸風力發電區塊開發共同廊道」. Accessed 15 January 2025.

[40] 附件 20 府農漁字第 1120291164 號, 附件 21 府農漁字第 1130028625 號

Taiwanese Humpback Dolphin MWH. The distance of the Project offshore footprint (ie WTGs and offshore substation) is approximately 20km from the Taiwanese Humpback Dolphin MWH.

Given the homogeneity of the open water habitat in the area and the minimal loss of open waters, it is expected that there will be minor impacts on marine mammal populations. Based on the information provided by Formosa 4, the Project will be using the three-legged jacket foundation design for the WTGs. The seabed area affected by the foundation required for one WTG will be approximately 530m^2, and the Project has a total of 35 WTGs. The area required for the offshore substation, which is also using a jacket foundation, is approximately 2700m^2. Hence, the total seabed area taken up by the Project WTGs and offshore substation is approximately 0.021km^2.

For Deshuai OWF, the maximum number of WTGs that will be constructed is 12, as per the EIA report. Assuming that the foundation design and offshore substation for Deshuai is similar to the Project's, the total seabed area taken up by Deshuai OWF's WTGs and offshore substation will be approximately 0.0069km^2. The total seabed area taken up by the Project and Deshuai OWF's WTGs and offshore substation will be 0.028km^2. This is considered to be a very small area as compared to the total marine habitat within the CIA spatial boundary.

Additionally, based on the Project and Deshuai OWF's EIA reports, the following mitigation measures related to vessel speed and navigation will be implemented to minimise the impacts to the Taiwanese Humpback Dolphin MWH:

- Construction vessels within 1500m radius of known Taiwanese Humpback Dolphin MWH are to maintain a speed below six knots
- Submarine cable-laying vessel speeds can only return to original levels if no cetacean activities are observed in the observation zone of 750m.

Further mitigation measures are detailed in Table 7.1, Section 7.2.1. With the mitigation measures in place, coupled with the small seabed area taken up by the Project and both Deshuai OWF, the cumulative impact is expected to be minor.

6.2.1.2 Operation phase

During the operation phase, it has been observed from a windfarm in operation in Western Taiwan that the area with wind turbines present had relatively better fish aggregation effect than nearby neighbouring artificial reefs (Huang, et al., 2021). The foundations of the WTGs can serve the function of artificial reefs, providing substratum for colonisation of marine fauna.

After the cable laying works is completed, the submarine export cables of the Project and Deshuai OWF will be buried, with the seabed reinstated. As such, there is no permanent loss of the Taiwanese Humpback Dolphin MWH expected due to the submarine export cables. The other identified MPAs within Miaoli County (ie Xihu Important Wetland and Wanwa Venus Clam Breeding Conservation Area) do not overlap with any of the other offshore windfarms considered within this CIA.

Of the eight protection reef area and eight artificial reef area identified to be within Miaoli County, it is observed that the majority of these protection and artificial reef areas overlap with the four offshore windfarms considered within this CIA.

Based on the offshore windfarms within Miaoli County considered within this CIA – Formosa 4, Deshuai, Formosa 1, and Formosa 2, the total number of WTGs totals up to 116. Table 6.6 below shows the design information for the offshore windfarms considered within this CIA. For information that is unknown, it is assumed to be the same as the Project. As such, the total seabed area taken up by the four offshore windfarms sums up to 0.50km^2. This is a relatively small area as compared to the total marine habitat area (ie oceans and seas) covered by the

CIA spatial boundary. Thus, the potential impact of the Project and the other offshore windfarms on marine habitat during operation phase is expected to be negligible.

Table 6.6: Project components of offshore windfarms considered in this CIA

	Formosa 4 (the Project)	Deshuai	Formosa 1	Formosa 2	Total
Number of WTGs	35	Maximum 12	22	47	116
Foundation design	Three-legged jacket	Monopile (preferred), 15m in diameter[41]	Monopile, maximum 8.4m in diameter[42]	Four legged jacket with pin piles of 2.4m in diameter[43]	-
Submarine cables	2 export cables (27km each), 0.3m in diameter IAC: 71km, 2.5m in diameter	Export cables • Option 1: <7km • Option 2: 29.6km	3 export cables, total length 13km[44] IAC: 21km	4 export cables, total length 34km[45] IAC: 80km	Approximately 281.6km

Source: Project Company, 2025; Unitech, 2023b; Formosa 1 Wind Power (https://formosa1windpower.com/location-c/); Formosa 2 Wind Power (https://formosa2windpower.com/en/)

The cumulative impacts on marine habitat during both construction and operation phase are summarised in Table 6.7 below.

[41] Deshuai offshore windfarm EIA report (美森離岸風力發電場興建計畫環境影響說明書), dated 2023

[42] Jan De Nul – All foundations on Formosa 1 Phase 2 installed

[43] Jan De Nul – Formosa 2 Offshore Wind Farm, Taiwan

[44] JDR cables – Formosa 1 Phase

[45] Jan De Nul – Jan De Nul successfully installed Formosa 2 Export Cables

Table 6.7: Summary of cumulative impact on marine habitat

Phase of Project	Indicator of cumulative impact	Potential impact identified	Mitigation measures	Residual impact magnitude – from Project	Residual impact magnitude – from other developments	Impact duration	Sensitivity	Cumulative impact significance (after mitigation)
Construction	Habitat fragmentation or disturbance	Disturbance effect from submarine cable installation	• Submarine export cables will be arranged in an array within the Project's corridor[46], which helps to minimise the disturbance to marine habitats. • Cable laying works will be done in segments • An observation zone of 750m will be established around the cable laying works within the Taiwanese Humpback Dolphin protected area during submarine cable laying, whereby visual monitoring for cetaceans will be conducted by at least two Taiwanese cetacean observers (TCO) • Cable laying vessels will need to reduce speed to a maximum of 3 knots if marine mammals enter the 750m observation zone • Submarine cable-laying vessel speeds can only return to original levels if no cetacean activities are observed in the observation zone of 750m	Minor	Minor	Short term	Not sensitive	Not significant

[46] The Project's corridor is the Fangli common corridor, which is a state-designated area by MOEA for offshore wind power block development. The Fangli cable corridor is designed to accommodate export cables from three independent projects, aligning with the common corridor concept to reduce cumulative environmental impacts. Currently, the Fangli common corridor is only known to be used by the Project, but could be used in the future by other projects.

Phase of Project	Indicator of cumulative impact	Potential impact identified	Mitigation measures	Residual impact magnitude – from Project	Residual impact magnitude – from other developments	Impact duration	Sensitivity	Cumulative impact significance (after mitigation)
		Disturbance effect from WTG and offshore substation installation	• Construction vessels within 1500m radius of known Taiwanese Humpback Dolphin MWH are to maintain a speed below six knots	Minor	Minor	Short term	Not sensitive	Not significant
Operation	Area of habitat loss	Project footprint falls permanently on sensitive marine habitat	• Following the cable laying works the cables will be buried, allowing the seabed to be reinstated. • WTG foundations can function similar to artificial reef areas	Negligible as there is no habitat loss	Negligible as there is no habitat loss	Short term	Not sensitive	Not significant

Source: Mott MacDonald, 2025

6.2.2 Marine flora and fauna

The cumulative impact that affects this VEC in the study area are relevant to changes or displacement in wildlife population mainly due to increased underwater noise, degradation of water quality, risk of vessel collisions during the construction phase. During the operation phase, there could be electromagnetic field (EMF) generated.

6.2.2.1 Construction phase

Underwater noise

During the construction phase, underwater noise and sound pressure will be generated by WTG foundation installation, offshore substation foundation installation, and also the operation of construction vessels. The potential impacts of underwater noise to marine fauna (especially to marine mammals) includes:

- Temporary/ permanent hearing loss
- Behavioural change/ reactions (eg temporary loss of feeding / breeding habitats resulting in habitat displacement)
- Interference with communication between individuals due to masking effects (ie in terms of audibility and frequency)

The Project will be adopting the jacket foundation installation method for both the WTGs and the offshore substation. Based on the Project's EIA report piling noise simulation results, the maximum sound pressure value at 750m from the foundation location ranges from 175.8 to 176.1 dB re 1 µPa. However, with noise reduction mitigation techniques in place, the sound pressure level is expected to reduce to 159.1 to 158.7 dB re 1 µPa at 750m from the foundation location. For Deshuai OWF, it is unconfirmed which type of foundation installation will be used, but underwater noise simulation was conducted for both sleeve type foundation and monopile foundation installation. Based on Deshuai's EIA report, the maximum sound pressure value at 750m from the foundation installation for the sleeve type foundation and monopile foundation is 158.5 and 138.8 db re 1 µPa respectively, after noise reduction mitigation techniques. The reduced sound pressure levels for the Project and Deshuai OWF are below the underwater noise control value of 160 dB re 1 µPa at a distance of 750m from the foundation centre.

It is noted the critical habitats of all six critical habitat marine species[47] overlaps with the Project and Deshuai WTG locations (see Figure 6.1). As such, there is a possibility that these marine fauna species may be sighted near the offshore windfarm areas during the WTG and offshore substation installation. However, the area of overlap is relatively small as compared to the total critical habitat areas of the various critical habitat marine species (less than 0.8%). Furthermore, during the foundation installation works, a "stop work" warning zone of 750m will be established, together with the deployment of qualified Taiwanese cetacean observers (TCOs) on board. The TCOs will conduct visual observations of cetaceans in four different directions of the warning zone, and foundation installation works will only be allowed to commence if there are no cetacean activities observed for at least 30 minutes within the 750m warning zone.

For the Taiwanese Humpback Dolphin, its critical habitat is located approximately 13.5km from the closest Project WTG location and overlaps with Deshuai OWF's offshore footprint (ie WTG location). The sound pressure value at the Taiwanese Humpback Dolphin MWH due to the foundation installation at the Project will be lower due to the attenuation of noise over distance. For Deshuai OWF, its offshore footprint overlaps with the Taiwanese Humpback Dolphin critical habitat, with the approximate area of overlap being 1.47km^2. The area of overlap is considered to be relatively small as compared to the whole area of the Taiwanese Humpback Dolphin

[47] Identified as critical habitat species as per the Project's CHA

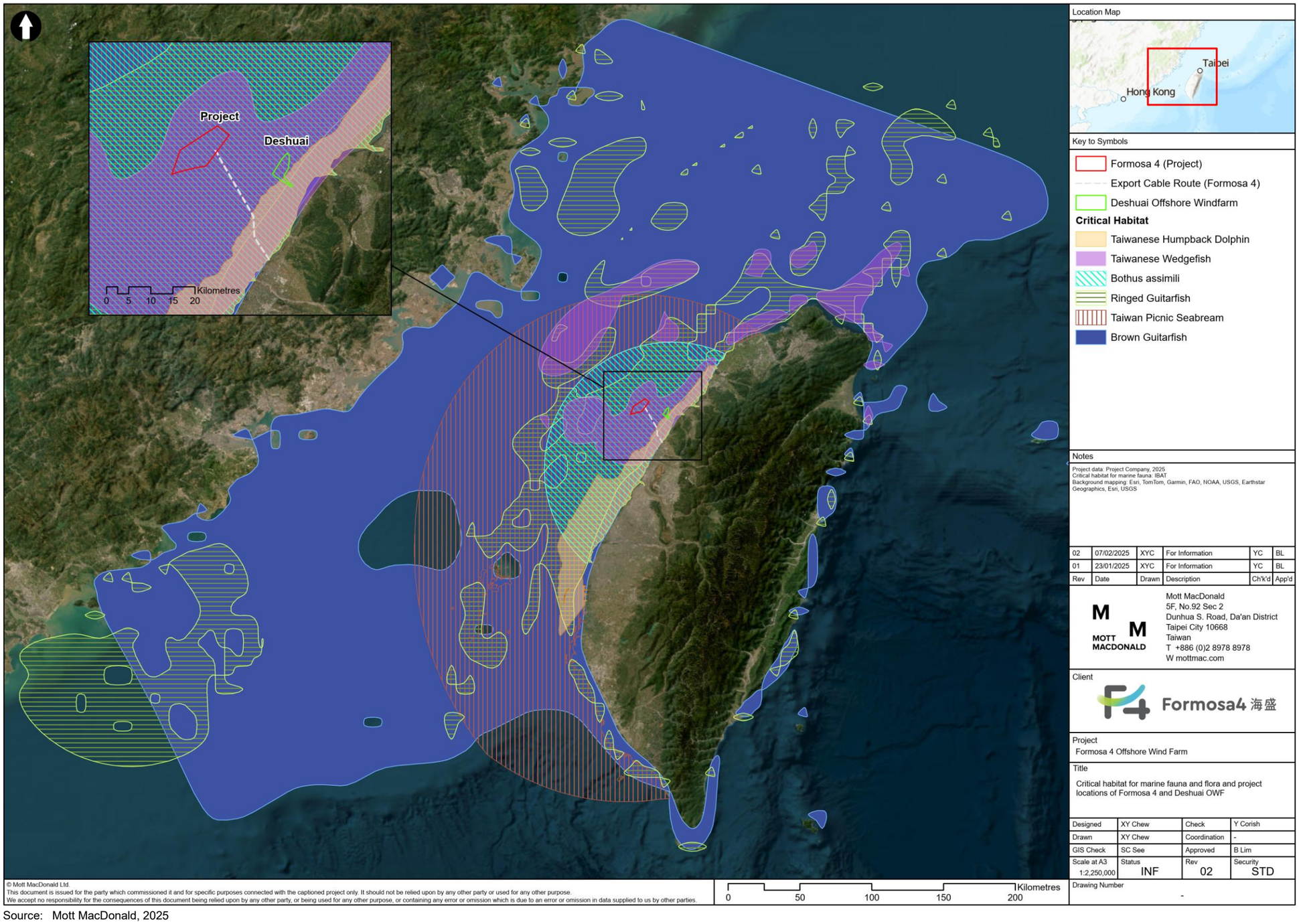
critical habitat (approximately 0.05%[48]). However, it is noted that Deshuai only overlaps with the Taiwanese Humpback Dolphin critical habitat and not the Taiwanese Humpback Dolphin major wildlife habitat. Considering that the underwater noise from the foundation installations is only temporary during the construction phase, and that the area of overlap with the critical habitat is very minor, the potential impacts of underwater noise from foundation installation from Deshuai OWF is expected to be minor. It is important to ensure that the noise reduction mitigation measures are in place to minimise the disturbance to the critical habitat species.

The underwater noise from construction vessels is highly related to the size and speed. With mitigations in place to limit the speed of the vessels, the impact of underwater noise generated by construction vessels on marine fauna is deemed to be limited.

Furthermore, measures are also in place to monitor underwater noise levels so that adaptive management strategies can be employed if required. The full list of mitigation measures can be found in Table 7.2.

[48] Calculated in ArcGIS

Figure 6.1: Critical habitats for marine fauna and flora and project locations of Formosa 4 and Deshuai OWF



Source: Mott MacDonald, 2025

Collision risk with construction vessels

Risk of collisions between construction vessels and marine fauna will potentially affect this VEC. The use of construction vessels may increase potential collision risks with marine mammals, leading to injuries or death. Furthermore, for marine species which are unable to swim or crawl, they would be less likely to escape collision from vessels, potentially increasing the risks of injury of death of marine fauna. Significant numbers of construction vessels and associated supporting and emergency rescue vessels are anticipated to be travelling across the windfarm sites and the shore for this Project and other windfarm developments.

Based on information provided by the Project Company and Deshuai's EIA report, a total of 37 vessels (ie 21 for the Project and 16 for Deshuai) will be mobilised for the construction activities. During the construction phase, various existing Taiwanese ports are planned to be used for delivery, transshipment, or construction support. Given that the Project is located near established shipping routes and international sea lanes, and that all planned ports to be utilised for the construction phase are classified as international commercial ports. Hence, the anticipated number of annual port calls attributed to the Project would be considered to be relatively insignificant as compared to the reported existing annual vessel traffic at these ports..

Navigation of these vessels may result in potential collisions with marine mammals, fish and sea turtle species which have a wide range of use and movements in the Taiwan Strait, leading to injury or death and thus potential change in population of these vulnerable marine animals.

In view of the above mentioned potential impact of vessel strike on marine fauna, the Project and Deshuai have committed to limit vessel speed near the Taiwanese Humpback Dolphin MWH. An observation zone of 750m will be established during submarine cable laying, whereby visual monitoring for cetaceans will be conducted by at least two TCO. Cable laying vessels will need to reduce speed to a maximum of 3 knots if marine mammals enter the 750m observation zone, and can only return to original levels if no cetacean activities are observed in the observation zone of 750m. In addition, it is recommended that their vessels comply with the practices/ standards necessary for safe navigation (eg mariner notice, sailing plan), as detailed in Section 7.2.2.

These measures are expected to minimise the impact of vessel strikes during the construction phase of the Project to insignificant levels. However, the cumulative number of construction vessels from the concurrent construction of the Project and Deshuai OWF and cumulative effect of vessel strikes are uncertain. Although construction vessel channels have been designated along the offshore windfarm sites, cumulative impact of vessel collision risk on this VEC could be moderate if there is no further management on capping of construction vessels to feasible numbers across the two projects.

Water quality degradation due to sediment suspension

Water quality is expected to be degraded due to suspended solids during the construction phase, mainly due to foundation installation and cable laying works. Polluted water quality may cause migration or loss of fish resources, degrade marine habitat for critical habitat triggering species like the Taiwanese picnic seabream, and impact foraging capabilities and food sources for marine mammals.

As presented in the Project's EIA deviation report, baseline levels of suspended solids (SS) for marine water quality were found to range from 1.3 to 3.2 mg/L. Foundation installation works[49] and laying of submarine cables[50] are conservatively estimated to increase suspended solid (SS) levels by >0.005 to 0.25 mg/L, and 0.63 to 1.68 mg/L respectively. Results showed that the

[49] Under rock dumping rate of 270m^3/hr

[50] Under maximum scouring rate of 450m^3/hr

suspended solids increase from rock-dumping work remain within the natural range of marine environment. Furthermore, due to the diffusion effect of currents and flows, the suspended solid concentration is expected to return to the original background level within 24 hours after completing the scouring protection construction.

There will also be an increase in suspended solids due to the construction works of Deshuai OWF, which has an overlapping offshore construction period with the Project. It is expected that the highest increase in suspended solids (ie worst case scenario) will be during simultaneous offshore construction works for these Projects. Based on Deshuai's EIA report, suspended solids within the seawater during simultaneous offshore foundation and cable laying works for the Project and Deshuai OWF were simulated. The SS level from the simultaneous offshore works from both offshore windfarms ranges from 2.2 to 2.6 mg/L. Even though the cumulative impact leads to an increase in the SS level, it is still within the natural range of the marine environment.

The concentration of the suspended solids from the offshore construction works will not be high, and the suspension will be of a short duration as the offshore works are temporary. As such, the cumulative impact on marine fauna from sediment suspension is expected to be negligible.

Habitat loss for marine benthos

Seabed areas occupied by WTGs, offshore substation and submarine cables may result in habitat loss for marine benthos. Benthic habitat loss caused by WTGs and offshore substations will be permanent, whereby cable laying will be reinstated after cable burial to allow the marine environment to return to its original stage.

As articulated in Section 6.2.1.2, the cumulative overall extent of habitat loss from the offshore windfarms considered in this CIA, even if both permanent and temporary losses are aggregated, is 0.028km^2. This area of habitat loss is considered small and are levels of magnitude below what might be considered significant given the size and scale of the marine habitat region.

It is also worth noting that the foundations of the WTGs are considered to have a potentially positive impact in benthos habitat creation during the operational phase. As such, the potential habitat loss for marine benthos is expected to be minor.

6.2.2.2 Operation phase

Underwater noise

The operation of wind turbines will generate a constant, low, basal level of underwater noise which may affect the behaviour of marine fauna. The impacts of underwater noise to marine fauna have been elaborated in Section 6.2.2.1 'Underwater noise' above.

Based on the Project's EIA report, the maximum sound pressure value from the Project's operations is 145.8 dB re 1 µPa. However, outside of the Project's offshore footprint, the sound pressure value is approximately 100 dB re 1 µPa or lower. Based on Deshuai's EIA report, a cumulative underwater noise simulation was undertaken for Deshuai, Formosa 1, and Formosa 2. Similarly, the sound pressure value outside of the three OWF projects' footprint is approximately 110 dB re 1 µPa or lower.

As compared to underwater noise from construction activities, the underwater noise from operation of the offshore windfarms is comparatively lower. Furthermore, measures are also in place to monitor any potential underwater noise impacts to marine fauna and enable adaptive management strategies if required. The impacts of underwater noise during operation phase is expected to be minor.

Collision risk with maintenance vessels

During the operation phase, there will be the use of maintenance vessels which may increase the potential collision risks with marine mammals, leading to injury or deaths. The potential impacts of collision risk due to maintenance vessels is the same as that of construction vessels and has been elaborated in Section 6.2.2.1 ‘Collision risk with construction vessels’ above.

During the operation phase, the anticipated number of annual port calls for the Project by offshore maintenance vessels would be considered to be relatively small as compared to the reported annual vessel traffic at the ports.

Furthermore, the number of vessels during the operation phase is expected to be limited, as compared to construction vessels which are much more significant in numbers. As such, the cumulative impacts of collision risk with maintenance vessels are likely to be minimal, especially with the mitigation measures in place.

Electromagnetic field effect

During the operation phase, electric currents in the inter array submarine cables may induce an electromagnetic field (EMF), which may potentially influence the behaviour of marine ecology. With the Project’s construction design approach, the potential significant adverse impact from EMF can be minimised, where:

- The submarine cable route from WTG to landfall shall take the shortest distance feasible
- The submarine cable will be buried 0.5 to 1.5m to reduce electromagnetic field (EMF) effects

Furthermore, there have been no conclusive assessments to date to show that EMF affects marine fish, and it is unlikely that EMF will affect larger marine mammals. Measures are in place to monitor marine mammal activity during operation so that adaptive management strategies can be employed if required. As such, the EMF cumulative impact on marine flora and fauna during operation phase is minor and not significant.

The cumulative impact on marine flora and fauna during construction phase and operation phase are summarised in Table 6.8 below.

Table 6.8: Summary of cumulative impact on marine flora and fauna

Phase of Project	Indicator of cumulative impact	Potential impact identified	Mitigation measures	Residual impact magnitude – from Project	Residual impact magnitude – from other developments	Impact duration	Sensitivity	Cumulative impact significance (after mitigation)
Construction	Change in/ displacement of population	Underwater noise impacts to marine fauna	Refer to Table 7.2	Minor	Minor	Short term	Sensitive	Not significant
		Risk of collision with construction vessels	● Project vessels will follow maritime navigation rules set by the Maritime and Port Bureau under the Ministry of Transportation and Communications (MOTC). As the Project is near an official navigation channel, vessels will use designated routes to reduce collision risks. ● Routing will follow traffic separation schemes to avoid head-on crossing encounters with other vessels. ● Construction vessels will avoid shallow or hazardous areas to reduce grounding risk. ● An observation zone of 750m will be established around the cable laying works during submarine cable laying, whereby visual monitoring for cetaceans will be conducted by at least two TCOs ● Cable laying vessels will need to reduce speed to a maximum of 3 knots if marine mammals enter the 750m observation zone ● Submarine cable-laying vessel speeds can only return to original	Minor	Minor		Sensitive	Not significant

Phase of Project	Indicator of cumulative impact	Potential impact identified	Mitigation measures	Residual impact magnitude – from Project	Residual impact magnitude – from other developments	Impact duration	Sensitivity	Cumulative impact significance (after mitigation)
			levels if no cetacean activities are observed in the observation zone of 750m ● Vessels to comply with the practices/ standards necessary for safe navigation (eg mariner notice, sailing plan)					
		Water quality degradation due to sediment suspension	Anti-turbidity/ silt curtains	Minor	Minor		Not sensitive	Not significant
		Habitat loss of marine benthos	Following the cable laying works, the cables will be buried, allowing the seabed to be reinstated.	Minor	Minor		Not sensitive	Not significant
Operation	Change in/ displacement of population	Underwater noise which may affect behaviour of marine fauna	Refer to Table 7.2	Minor	Minor	Long term	Sensitive	Not significant
		Vessel strikes with maintenance vessels	● Vessel speed control ● Navigation safety plan	Minor	Minor		Sensitive	Not significant
		Effect of electromagnetic field (EMF)	● The submarine cable route from WTG to landfall shall take the shortest distance feasible. ● The submarine cable will be buried 1 to 2m (2m within the nearshore area) to reduce EMF effects.	Minor	Minor		Not sensitive	Not significant

Source: Mott MacDonald, 2025

6.2.3 Migratory birds (including seabirds at sea)

6.2.3.1 Operation phase

Bird collision risk with wind turbines

The key threat of the cumulative development of offshore windfarms to migratory birds and seabirds at sea is bird collision with the WTGs. The frequency and likelihood of such collision event is dependent on the bird species, and their flight altitude. Due to the risk of collision with WTG and barrier effect from the Project and other offshore windfarm developments within Miaoli County, the cumulative effect of the changes in migratory bird population are of importance for this VEC within the CIA spatial boundary.

By considering the overlap of average bird flight altitude with the rotation range of wind turbine blade, flexibility of habitat use, survival rate of adult and national conservation status, results showed that migratory waterbirds (Charadriidae and Scolopacidae) and breeding seabirds (Sternidae) are considered vulnerable groups. A total of 10 visual surveys and 10 radar surveys for offshore birds was conducted for the Project from 2020 to 2021. The survey shows that majority of the bird sightings is below the height of the wind turbine rotation zone.

It is noted that the following five species are critical habitat triggering species as identified in the Project's CHA – Black-faced spoonbill (BFS, migratory bird), Oriental stork (migratory wading bird), Chinese crested tern (migratory seabird), Baer's Pochard (migratory diving duck), and Kentish Plover (migratory wading bird).

It is recognised that the bird collision risk with wind turbine blades of offshore windfarms mainly occur during the offshore windfarm projects' operation phase. A collision risk model (CRM) has been conducted within the Project's EIA report, and the annual collision number with the Project is estimated to be 26.6 birds/year[51]. CRM has also been conducted for the other neighbouring offshore windfarm projects within their respective EIA reports. The EIA report for Deshuai OWF conducted a cumulative CRM for various bird species, across Deshuai, Formosa 1 and Formosa 2 OWF. The bird species covered within the cumulative CRM in Deshuai's EIA includes:

- Grey-faced buzzard (灰面鵟鷹)
- Chinese sparrowhawk (赤腹鷹)
- Black-faced spoonbill (黑面琵鷺)
- Greater crested tern (鳳頭燕鷗)
- Little tern (小燕鷗)

The cumulative CRM for the offshore windfarms considered within this CIA from the various EIA reports and has been compiled within Table 6.9 below.

[51] Based on the scenario from the bird collision modelling which assumes an individual WTG capacity of 14MW and 98% avoidance rate of birds

Table 6.9: Cumulative CRM results of Project and surrounding offshore windfarms with 98% avoidance rate (from EIA reports)

Offshore windfarm	Number of WTGs	Simulated annual bird collision count based on 98% avoidance rate				
		Grey-faced buzzard	Chinese sparrowhawk	BFS	Greater crested tern	Little tern
Formosa 4 (Project)[52]	35[53]	1.71	1.16	0.4	-	-
Formosa 1	22	0.82	6.23	0.1	0.5	0
Formosa 2	47	0.33	0.75	0.21	1.9	0
Total		**2.86**	**8.14**	**0.71**	**2.4**	**0**
1% of species population (threshold)		1004	2707	31	106	18
Potential biological removal (PBR)[54]		3512	9202	42	85	-

Source: Unitech, 2023a; Unitech, 2023b

Further to the above EIA CRM, an updated cumulative CRM has been conducted for all five CH species, which includes the Project, Formosa 1 and Formosa 2. As the updated collision risk model is carried out based on the latest project and biodiversity information, for species which have been modelled in both models (ie from EIA and the additional CRM), the annual bird collision count in the updated model should be referenced to.

Over the Project's operations of 20 years, the total annual collision count for each modelled bird species (from the updated CRM) is less than 1% of the species population. Furthermore, based on the baseline surveys conducted for the Project during 2020 to 2023, only one of the CH species – Kentish plover, was observed. The other CH species were not observed during the surveys. As such, the collision risk of the Project is expected to be relatively minor and is unlikely to affect the natural growth trend of the population.

Based on the cumulative CRM results for all three OWFs[55] considered within this CIA as shown in Table 6.9 and the updated CRM conducted, the annual collision count for each of the modelled bird species is less than the 1% of the species population. As such, the cumulative impact of bird collision risk from the Project and other developments is also considered to be minor. The overall collision risk is therefore considered to be not significant.

Additionally, for the Project, various design considerations have been incorporated to minimise the risk of bird collisions. Measures are also in place to monitor any potential bird mortalities and enable adaptive management strategies if required. The Project's biodiversity action plan (BAP) also aims to achieve a net gain in species populations, including proposed adaptive measures for the Project.

Barrier effect

Studies have shown that the presence of WTGs may initiate avoidance behaviour and results in birds having to fly around the WTGs area (Desholm & Kahlert, 2005). However, the added distance to fly around the offshore windfarms and adjacent offshore windfarms is relatively small as compared to the total distance flown by migratory birds at sea. Radar surveys were also

[52] The CRM conducted in Formosa 4's EIA report does not include the Greater crested tern and Little tern

[53] Based on the WTG capacity of 14MW, which is the closest to the actual planned capacity of 14.142MW

[54] PBR estimates the number of bird fatalities that allow a population to maintain its optimal sustainable population, which indicates the risk of population change given a specific number of mortality

[55] Deshuai OWF is not included in the cumulative CRM as it is noted that MOEA has issued an official letter to the developer of Deshuai offshore windfarm on 21 May 2025 to revoke the development rights.

conducted as part of the baseline studies for the Project and Deshuai OWF, and the EIA reports suggests that there will be minimal impact to the flight path of migratory birds.

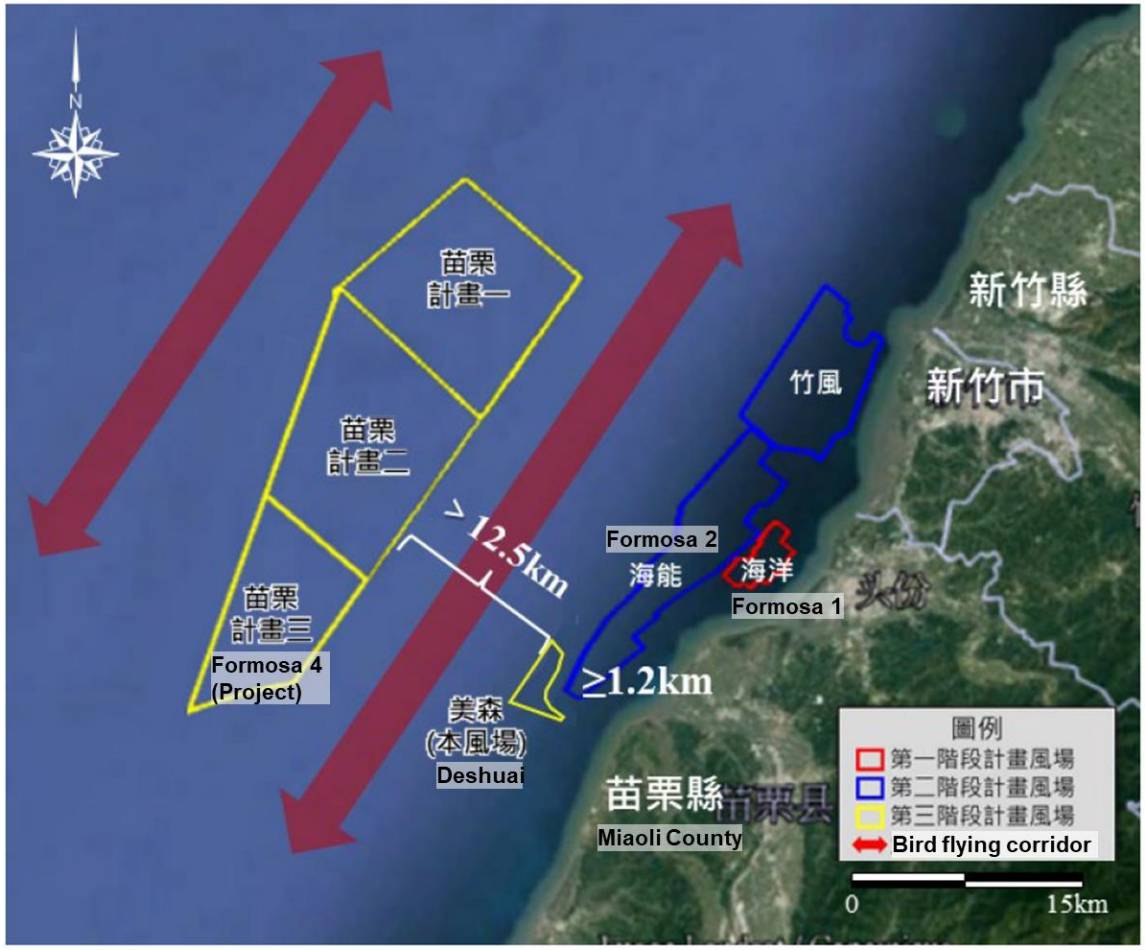
The space between wind turbines should be reserved to a sufficient degree to allow birds to fly through. As per the Environmental Protection Administration (EPA), an interval of 700m should be kept between the wind turbines, and the distance between blades of adjacent wind turbines should be greater than 400m. Even though the proposed distances by the EPA has not been promulgated, the offshore windfarm projects considered in this CIA follows the proposed distances. According to the Project and Deshuai OWF's EIA reports, the distance between wind turbines for the Project and Deshuai OWF will be at least 750m and 700m respectively. A bird flight corridor will also be left between the offshore windfarms to allow birds to fly through. As per the EIA reports, a 2km bird corridor will be left between adjacent offshore windfarms and the Project. For Deshuai OWF, a 1.2km bird corridor will be left between Deshuai and Formosa 2. The bird flight corridors for the offshore windfarms off the coast of Miaoli County is shown in Figure 6.2 below.

In the United Kingdom, a study on bird avoidance behaviour and collisions around offshore windfarms has been done to support consenting applications for offshore wind development (Skov, et al., 2018). The results showed that the empirical avoidance rates of five target seabird species were over 99%. Though the study was not conducted in Taiwan, it can be inferred that bird species do exhibit avoidance behaviour to avoid colliding with wind turbines.

With the project design and monitoring in place to minimise avoidance behaviour, and the additional distance required for birds to fly around the array area considered to be relatively small, the barrier effect on migratory birds is considered to be not significant.

The cumulative impact on migratory birds during operation phase is summarised in Table 6.10 below.

Figure 6.2: Bird flight corridor and offshore windfarms at Miaoli County offshore area



Source: Unitech, 2023b

Table 6.10: Summary of cumulative impact on migratory birds (including seabirds at sea)

Phase of Project	Indicator of cumulative impact	Potential impact identified	Mitigation measures	Residual impact magnitude – from Project	Residual impact magnitude – from other developments	Impact duration	Sensitivity	Cumulative impact significance (after mitigation)
Operation	Change in population	Collision with wind turbine blades	• Surveillance devices will be installed within the windfarm to allow continuous monitoring of bird activities. • Radar survey will be conducted to monitor bird migratory flightpaths. • Ten visual surveys per year will be conducted throughout the operation of the Project, in the vicinity of the Project's offshore WTG footprint • Measures within Project's BAP	Minor	Minor	Long term	Sensitive	Not significant
	Behavioural change in migratory birds (including seabirds at sea)	Barrier effect	• For the Project, the spacing between the wind turbines is at least 750m, and 700m for Deshuai OWF. • The distance between blades of adjacent turbines for the Project (and Deshuai) with other adjacent OWF (if any) should be at least 400m. • A bird flight corridor between adjacent offshore windfarm developments will be set aside for birds passing through. For the Project, the corridor will be 2km wide, and for Deshuai OWF, it will be at least 1.2km wide. • Measures within Project's BAP	Minor	Minor	Long term	Not sensitive	Not significant

Source: Mott MacDonald, 2025

6.3 Socio-economic VEC

6.3.1 Community livelihood: fisheries resources and zones

Cumulative impacts that affect this VEC are related to shifts in livelihoods, mainly caused by loss of fishing areas and access to marine resources.

6.3.1.1 Construction phase

Loss of fishing areas and access to marine resources due to installation of submarine cables

In the spatial aspect, it is understood that all Miaoli County fisher folks only conduct coastal fishing, hence their active fishing zones extend 12 nautical miles or 22km off the coast of Miaoli County. It is also understood that the Tongyuan EFR area extends out to 3 nautical miles (or 5.6km) from the coasts of Yuanli Township and Tongxiao Township. The Project's offshore windfarm area's closest point to shore is around 22km, hence it is expected that the Project will have little to no overlap with TFA's coastal fisher folks' fishing grounds. It is not expected that the construction of WTG and offshore substation within the Project's windfarm area will impact fisher folks.

However, the Project's offshore submarine cable route does overlap with the general coastal fishing grounds as well as the Tongyuan EFR area, indicating the construction and maintenance of offshore submarine cables may temporarily impact coastal fisher folks.

The installation of the submarine cables will result in fishery activities located within the submarine cable route to be temporarily affected. The submarine cable route runs from the coast of Yuanli Township to the Project's wind farm area and overlaps with the Tongyuan EFR area. It is expected that these access restrictions will impact all coastal fisher folk (ie fishing within the 12 nautical mile zone from the coast).

The approximate coastline distance Yuanli Township and Tongxiao Township is 16.8km, which means the general coastal fishing grounds area for Tongyuan EFR fisher folk is 369.6km^2. It is understood that the temporary access restrictions due to submarine cable construction is only a small portion (<5%) of the general coastal fishing grounds area for Tongyuan EFR fisher folk. However, it is acknowledged that fisher folk are not strictly geographically limited to conduct fishing activities only in the EFR area of their licence registration and may travel to other coastal waters outside of the waters extending out from the Tongyuan EFR zone. The Project will undertake compensations to the PAPs, details on the compensations will be covered within the Project's Livelihood Restoration Plan (LRP)[56] accordingly.

The laying of the offshore export cables is targeted to commence in Q2 2026. It is expected that the offshore cable laying works will be segmented (around 200m per segment), and the restrictions will be lifted once the cables are buried. Hence, the impact for the construction phase is temporary. Furthermore, it is expected that most vessels may still be allowed to cross the cable route area during the construction phase, given they stay at least a 500m distance from the vessels working on the cables. It is also expected that once in the operation phase, most fishing vessels are no longer restricted from the cable route. Access restrictions to cable routes are only expected to apply during maintenance or emergency work.

In terms of cumulative impact, no other neighbouring offshore windfarm projects (ie Deshuai offshore wind farm) will be utilising the Fangli cable corridor for their export cable installations during the Project's cable construction period. It is understood a proposed Yongan-Tongxiao

[56] Project's Livelihood Restoration Plan, dated May 2025

Gas Pipeline 2 project by CPC Corporation may utilise the Fangli cable corridor to connect the pipeline onshore to Miaoli County. However, there is uncertainty as to whether the project will go ahead based on publicly available information, and the likelihood of spatial and temporal overlap of the pipeline project is low. If the project does go ahead, coordination to stagger construction between the Project and the pipeline project is also a possibility. Thus, cumulative impacts expected upon PAPs for the Project's export cable installation are considered minor.

Loss of access to marine resources due to increased marine traffic

During the construction phase, there is a potential short term temporal overlap of the Project with neighbouring Deshuai offshore wind farm's construction phase. This will result in a greater number of vessels (ie construction vessels) operating within the Tongyuan EFR, resulting in increased marine traffic and reduced access to marine resources for the fisher folks. A significant number of construction vessels and associated supporting and emergency rescue vessels are anticipated to be travelling across the windfarm sites and the shore for this Project and other windfarm developments. Based on information provided by the Project Company and Deshuai's EIA report, a total of 37 vessels (ie 21 for the Project and 16 for Deshuai) will be mobilised for the construction activities.

During the construction phase, various existing Taiwanese ports are planned to be used for delivery, transshipment, or construction support. Given that the Project is located near established shipping routes and international sea lanes, and that all planned ports to be utilised for the construction phase are classified as international commercial ports. Hence, the anticipated number of annual port calls attributed to the Project would be considered to be relatively insignificant as compared to the reported annual vessel traffic at these ports..

Based on the Project and Deshuai's EIA reports, vessel speeds during cable laying will be around three to four knots, and there will also be guard vessels deployed around those vessels to help mitigate risks of collision. Thus, cumulative impacts expected are considered minor.

6.3.1.2 Operation phase

Loss of fishing areas and access to marine resources due to operations of windfarm

For the operation phase of this Project and other windfarm developments, there may be loss in fisheries resources or fishing ground as the WTG sites of this Project and other windfarm developments will be occupying marine habitats for fishes. However, it is expected that there would not be a significant loss in fishing grounds as the windfarms are not located within the area of Exclusive Fishing Rights (EFR), Protected Reef Areas and Artificial Reef Areas. Additionally, it is noted that fisher folks in Miaoli County are mainly involved in coastal fishing activities. As the Project's windfarm location is largely located outside of expected/ typical range of coastal fishing areas, it will not add additional impacts to loss of fishing grounds beyond other windfarm developments (ie Deshuai). As such, this cumulative impact is considered as minor, and not significant.

Impact on navigation safety due to increased marine traffic

During the operation phase, maintenance vessels may lead to increased marine traffic within the area. However, the number of vessels during the operation phase is expected to be limited and will only be required during maintenance work. There are also no specific access restrictions to the cable areas or wind turbines, and fishing vessels are just requested to not obstruct any operation and maintenance (O&M) works. Access restrictions to cable routes are only expected to apply during emergency or maintenance works.

During the operation phase, the anticipated number of annual port calls for the Project by offshore maintenance vessels would be considered to be relatively small as compared to the reported annual vessel traffic at the ports.

With appropriate mitigation measures in place such as a navigation safety plan, risks associated with collisions with maintenance and fishing vessels are expected to be minimal.

The cumulative impacts on community livelihood during both construction and operation phase summarised in Table 6.11 below.

Table 6.11: Summary of cumulative impact on community livelihood – fisheries resources and zones

Phase of Project	Indicator of cumulative impact	Potential impact identified	Mitigation measures	Residual impact magnitude – from Project	Residual impact magnitude – from other developments	Impact duration	Sensitivity	Cumulative impact significance (after mitigation)
Construction phase	Shifts in livelihoods	Loss of fishing area and access to marine resource due to installation of submarine cables	• The WTG site of the Project area is largely outside the area of the coastal fishing zone • 500m radius clearance safety zone for the export cables will be applied • Vessel speed control • Vessel collision assessment and navigation safety plan • More measures can be found in Table 7.4	Minor	Minor	Short term	Not sensitive	Not significant
		Loss of fishing area and access to marine resource due to increased marine traffic		Minor	Moderate	Short term	Not sensitive	Not significant
Operation	Shifts in livelihoods	Loss of fishing area and access to marine resources due to installation of submarine cables	• The WTG site of the Project area is largely outside of the area of the coastal fishing zone • No restriction access for most vessels • Vessel collision assessment and navigation safety plan • More measures can be found in Table 7.4	Minor	Minor	Medium term	Not sensitive	Not significant
		Impact on navigation safety due to increased marine traffic		Minor	Minor	Medium term	Not sensitive	Not significant

Source: Mott MacDonald, 2025

7 Step 6: Management strategies

7.1 Overview

This section presents the management strategies designed to address the Project's incremental contribution to cumulative impacts on the selected assessed VECs (Step 6). For each selected VEC, an appropriate management action was identified following the mitigation hierarchy concept – avoid, minimise and compensate. Effective indicators and threshold triggers are also proposed. The set of strategies are based on the Project's level of impact on a referred VEC and the overall cumulative impact to the VEC. Required measures and tangible and reasonable best efforts to mitigate impacts were also taken into consideration.

In order to identify adequate strategies, plans and procedures to manage the Project's contribution to cumulative impacts, the mitigation and monitoring plan identified in the EIA reports were reviewed.

7.2 Biodiversity VEC

7.2.1 Marine habitat

The extent of impact associated with construction works fragmentating the marine habitats (ie Taiwanese Humpback Dolphin MWH) is expected to be minimised by arraying the submarine cables within a common corridor. It is to note that there will be no other offshore windfarms in the vicinity that will be using the same common corridor as the Project, as Deshuai OWF will be using another common corridor that is further away.

According to the Project's EIA report, the following management actions for marine habitats are consolidated in Table 7.1 below.

Table 7.1: Mitigation and monitoring for marine habitats to be implemented at Project level

Phase	Mitigation measure / monitoring at Project level
Pre-construction	The submarine cable route from the WTG to landfall will take the shortest distance feasible.
	The Project footprint avoids Marine Protected Areas, including Fisheries Resources Conservation Areas.
	As the submarine cable may potentially intersect with Protection Reef Areas and Artificial Reef Areas (ie man-made structures for coastal protection), the Project has actively communicated with relevant stakeholders and has obtained consensus and approvals from the relevant authorities prior to construction activities.
Construction	Use of horizontal directional drilling (HDD) for cable laying in the intertidal area to minimise impact to the natural coast.
	Vessel speed and navigation: ● Vessel speeds will be limited to a maximum of 6 knots within 1.5km from the proposed Taiwanese Humpback Dolphin MWH. ● Project vessels will follow maritime navigation rules set by the Maritime and Port Bureau under the Ministry of Transportation and Communications (MOTC). As the Project is near an official navigation channel, vessels will use designated routes which has been designed to avoid sensitive, shallow or hazardous areas, and to reduce collision risks. ● Routing will follow traffic separation schemes to avoid head-on crossing encounters with other vessels. ● Vessel collision assessment and navigation safety plan.
	Construction monitoring:

Phase	Mitigation measure / monitoring at Project level
	● Underwater photography will be conducted quarterly during the pre-construction phase, once after pilling works have concluded and quarterly during the operation phase. ● Intertidal surveys will be conducted once every quarter. ● An observation zone of 750m will be established around the cable laying works within the Taiwanese Humpback Dolphin protected area during submarine cable laying, whereby visual monitoring for cetaceans will be conducted by at least two TCOs. ● At least two Taiwan cetacean observers (TCOs) will be deployed to conduct continuous visual observations. ● Real-time passive acoustic monitoring (PAM) device will be installed. ● During nighttime or periods of poor visibility, night vision equipment or thermal imaging devices will be used to assist, covering a monitoring radius of 750 meters. ● Cable laying vessels will need to reduce speed to a maximum of 3 knots if marine mammals enter the 750m observation zone. ● Submarine cable-laying vessel speeds can only return to original levels if no cetacean activities are observed in the observation zone of 750m.
Operation	Vessel speed and navigation: ● Vessel speeds will be limited to a maximum of 6 knots within 1.5km from the proposed Taiwanese Humpback Dolphin MWH. ● Vessel collision assessment and navigation safety plan.

Source: Unitech, 2023a; Unitech, 2024; Project Company, 2025

7.2.2 Marine flora and fauna

The construction period of the Project might overlap with the construction of Deshuai OWF, as dependent on Deshuai actual/ final schedule. The actual cumulative potential is yet to be determined, pending further development of Deshuai. At this stage, significant cumulative impacts from the offshore works are unlikely. Where further information/ details are available, the Project will further consider the need/ applicability to establish reasonable measures (eg to manage marine traffic and works) in collaboration/ coordination with Deshuai OWF.

The concerned marine fauna species studied as part of this VEC have a wide range of movement in the Taiwan strait. To minimise the cumulative impact of collision risk between working vessels and marine fauna (as discussed in Section 6.2.2), the Project is recommended to ensure that their vessels comply with the practices/ standards necessary for safe navigation (eg mariner notice, sailing plan). The aim would be to have measures in place covering avoidance of vessel collisions, port entry and exit safety, with reference or alignment to the vessel navigation-related mitigation measures for the Taiwanese Humpback Dolphin MWH as discussed in Section 7.2.1.

The relevant management measures for marine fauna from the Project's EIA is consolidated in Table 7.2 below.

Table 7.2: Mitigation and monitoring for marine fauna to be implemented at Project level

Phase	Mitigation measure / monitoring at Project level
Pre-construction	Adopt jacket type foundation for WTGs which generates low-noise level during pile driving, as far as practicable.
	The submarine cable will be buried 0.5 to 1.5m to reduce EMF effects.
	Underwater photography will be conducted quarterly during the pre-construction phase, once after pilling works have concluded and quarterly during the operation phase.
Construction	Construction monitoring: ● Cetacean monitoring will be conducted as boat survey with at least 20 times per year to monitor the cetacean activity and understand the impact significance.

Phase	Mitigation measure / monitoring at Project level
	● Four monitoring stations (with underwater microphones) will be set up 750m away from each WTG foundation location in four directions during installation works to monitor any cetacean presence as well as sound exposure levels. ● Fish and benthos surveys will be conducted once every quarter to understand the impact significance. ● Environmental monitoring of sea water quality (particularly turbidity) will be carried out during offshore works (ie WTG foundation, and submarine cable laying).
	Offshore foundation installation of WTG foundation: ● No acoustic deterrent devices (ADD) will be utilised. ● A “stop work” warning zone of 750m and pre-warning zone of 750-1500m radius from the foundation will be established and maintained during installation, with the deployment of at least three qualified Taiwan cetacean observers (TCOs) on board conducting visual searches at four different directions of the warning zone and pre-warning zone. ● A stop work notice will be implemented when marine mammals enter the warning zone (ie 750m radius from foundation location). ● Foundation installation can only commence if no cetacean activities are observed for at least 30 minutes in the warning zone of 750m. ● Continuous acoustic and visual cetacean monitoring will be conducted during foundation installation to monitor cetacean activity as well as monitor sound exposure levels (SEL). ● Visual cetacean monitoring can only be conducted when visual visibility is deemed satisfactory, which includes the following conditions: visibility of at least 500 meters, wave height of 1 meter or less, absence of rain, fog, and strong backlighting. ● Overall, 95% of underwater SEL must not exceed 160dB and peak sound pressure levels (SPL_{peak}) must not exceed 190dB at a distance of 750m from the foundation centre. ● The warning SEL threshold of a single piling event is noted to be 158dB during a single foundation installation event (30sec average). If the warning threshold is exceeded, additional response measures will be undertaken to reduce underwater noise. ● Foundation installation works will only recommence 30 minutes after ensuring no cetacean activity within the warning zone. ● No start of new foundation installation activity during the period of 1 hour before sunset until before sunrise. ● All video records of foundation installation works must be with date and time, and the recording must remain for at least five years. ● Noise reduction mitigation techniques (eg bubble curtain) will be used during pilling works to minimise underwater noise. ● Soft start (ramp-up) foundation installation method for at least 30 minutes will be used. ● Offshore construction activities will be coordinated between the windfarms of the Project Company to ensure pile driving of only one WTG will be conducted at any one time.
	Vessel speed and navigation: ● Vessel speeds will be limited to a maximum of 6 knots within 1.5km from the proposed Taiwanese Humpback Dolphin MWH. ● Submarine cable-laying vessel speeds can only return to original levels if no cetacean activities are observed in the observation zone of 750m. ● Project vessels will follow maritime navigation rules set by the Maritime and Port Bureau under the Ministry of Transportation and Communications (MOTC). As the Project is near an official navigation channel, vessels will use designated routes to reduce collision risks. ● Routing will follow traffic separation schemes to avoid head-on crossing encounters with other vessels. ● Construction vessels will avoid shallow or hazardous areas to reduce grounding risk. ● Vessel collision assessment and navigation safety plan.
	Water quality: ● Silt screens will be deployed around the intertidal area during the laying of submarine cables to minimise the dispersion of suspended sediments while preventing the access of marine organisms into the construction boundary.

Phase	Mitigation measure / monitoring at Project level
	● Wastewater and excavated material will not be discharged to the intertidal zone. Wastewater will be collected on-site and disposed of by a licensed third-party water waste disposal company.
Operation	Operation monitoring: ● Two underwater microphones will be deployed quarterly to monitor underwater noise. ● 20 visual survey trips will be conducted each year to monitor the cetacean activity to understand the impact significance. ● Fish and benthos surveys will be conducted once every quarter to understand the impact significance. ● 20 visual survey trips will be conducted each year to monitor the cetacean activity to understand the impact significance.
	Vessel speed and navigation: ● Vessel speeds will be limited to a maximum of 6 knots within 1.5km from the proposed Taiwanese Humpback Dolphin MWH. ● Vessel collision assessment and navigation safety plan.

Source: Unitech, 2023a; Unitech, 2024; Project Company, 2025

7.2.3 Migratory birds (including seabirds at sea)

To minimise the impacts on migratory birds (including seabirds at sea) due to the risk of collision with WTGs, the Project has created bird flight corridors to favour avoidance behaviour of birds (see Section 6.2.3.1). Management actions are consolidated in Table 7.3 below.

Furthermore, it is noted that the Project's BAP outlines action plans to ensure conservation and enhancement of biodiversity, in particular for critical habitat species identified in the Project's CHA.

Table 7.3: Mitigation and monitoring for migratory birds (including seabirds at sea) to be implemented at Project level

Phase	Mitigation measure / monitoring at Project level
Pre-construction	The Project will follow Article 17 of the Aviation obstacle sign and obstacle light setting standard ie the electric generator structure will use Type A obstructing light. Its implementing method will follow horizontal direction intervals not exceeding 900m and be implemented on the corners or most outer row. The number of warning lights installed on the turbines will therefore be based on the wind farm layout configuration.
	WTG placement will be designed to ensure sufficient distance (ie 750m) between WTGs to allow for birds flying through the Project's offshore WTG footprint.
	A "flight corridor" of at least 2 km wide within the Project's offshore WTG footprint and nearby offshore WTG footprint from other projects will be set aside for birds passing through.
	Radar survey will be conducted for one year (ie 3 surveys in spring, summer, autumn and 1 survey in winter) to monitor bird migratory flightpaths.
Construction	Follow the design of WTG placement allowing bird flight corridors between WTGs and adjacent offshore windfarms to minimise bird collision with wind turbines.
Operation	● Surveillance devices (ie thermal imaging, acoustic microphone, radar) will be installed within the windfarm to allow continuous monitoring of bird activities. ● Radar survey will be conducted to monitor bird migratory flightpaths. ● Visual surveys will be conducted for one year (ie 3 surveys in spring, summer, autumn and 1 survey in winter) throughout operation in the vicinity of Project's offshore WTG footprint.

Source: Unitech, 2023a; Unitech, 2024

7.3 Socio-economic VEC

7.3.1 Community livelihood: fisheries resources and zones

It is recommended that relevant developers of nearby windfarm developments and coastal developments that would affect the same fishing ground in Miaoli County would coordinate or liaise with the Tongyuan Fishermen's Association (TFA) on the management actions (designed at a project level and summarised in Table 7.4 below) to achieve effective mitigation of cumulative impact on fisheries livelihoods over the construction and operations of the Project development. Furthermore, the Project has requested TFA to advise all local fisher folk to avoid activities and navigation that may obstruct or hinder project work within the Project's area. The access restrictions are summarised in Table 1.3 above.

Further mitigation measures for fisheries can be found within the Project's focused social impact assessment (FSIA) and livelihood restoration plan (LRP).

Table 7.4: Mitigation and monitoring for fisheries and navigation safety to be implemented at Project level

Phase	Mitigation measure / monitoring at Project level
Construction	Fisheries: ● Survey of plankton, fish fry, fish egg and benthos as well as line survey of fish species and abundance once every quarter. ● Observation by underwater photography at five WTG foundations for the colonisation effect of fish. ● Annual analysis of the Taiwan Fisheries Yearbook from Fisheries Agency to organise related fishery livelihood and economics information (fishery environment, fishery facilities, number of fisher folk, amount of catch).
	Navigation safety: ● Deployment of patrol boats during construction phase. ● Vessel collision assessment and navigation safety plan. ● Installation of warning lights at the perimeter of the wind farm to alert surrounding fishing vessels.
Operation	Fisheries: ● Survey of plankton, fish fry, fish egg and benthos as well as line survey of fish species and abundance once every quarter. ● Observation by underwater photography at five WTG foundations for the colonisation effect of fish. ● Annual analysis of the Taiwan Fisheries Yearbook from Fisheries Agency to organise related fishery livelihood and economics information (fishery environment, fishery facilities, number of fisher folk, amount of catch).
	Navigation safety: ● Vessel collision assessment and navigation safety plan. ● Potential access restrictions to cable routes during maintenance or emergency work.

Source: Unitech, 2023a; Project Company; FCCA, dated 28 March 2025; Project Company, 2025

7.4 Collaboration with adjacent developments

Besides the mitigation and monitoring plans identified from the Project's EIA reports, it is important for the Project and adjacent offshore windfarm developments to coordinate their management plans and share information with each other for a more robust and comprehensive management of the identified impacts. The environmental management plans should ideally be standardised, and monitoring programmes should be integrated between offshore windfarm developments in the area (ie offshore windfarms off the coast of Miaoli County). This allows for a wide-reaching dataset, providing the developers of each offshore windfarm an opportunity to

identify additional mitigation measures. Proposed actions, including discussing and exploring the feasibility of information sharing with other windfarm developers in the area, as well as potential offsets and additional conservation actions with various stakeholders, will be considered and may be incorporated into the Project's BAP[57].

Furthermore, it is noted that there could potentially be future subsea gas pipeline projects that will intersect with the Project's export cables. For future coastal developments that could have a potential for cumulative impacts on the identified VECs with the Project, the Project is proposed to coordinate/ have discussions with the relevant coastal developments to minimise the impacts on the VECs. Coordination with CPC company, the project company for the potential pipeline project, will be handled by the cable package technical team, commercial representatives, and regulatory personnel. Such coordination will be conducted through technical and commercial mechanisms, which includes regular meetings, site visits, and a formal pipeline crossing agreement prior to construction.

[57] The Project's BAP is currently still being developed at the time of writing.

8 References

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Unitech New Energy Engineering Co., Ltd, 2017b. *Formosa 1 Offshore Wind Farm Project Environmental Impact Assessment 6th Deviation Report (海洋竹南離岸式風力發電計畫（第 6 次變更）環境影響差異分析報告),* s.l.: s.n.

Unitech New Energy Engineering Co., Ltd, 2018. *Formosa 2 Offshore Wind Farm Project Environmental Impact Assessment (海能離岸風力發電計畫環境影響說明書),* s.l.: s.n.

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A. List of documents reviewed

The list of documents reviewed for this CIA includes:

- Formosa 4 offshore windfarm (Project)
  - Environmental impact assessment (EIA) report (苗栗離岸風力發電計畫三環境影響說明書) (Unitech New Energy Engineering Co., Ltd, 2023a)
  - Environmental deviation report (EDR) (苗栗離岸風力發電計畫三環境影響差異分析報告) (Unitech New Energy Engineering Co., Ltd, 2024)
  - Environmental monitoring reports (苗栗離岸風力發電計畫三 環境監測報告)
    - October 2022 to December 2022
    - January 2023 to March 2023
    - April 2023 to June 2023
  - Collision risk modelling report for critical habitat species (海盛離岸風場鳥類行動計畫潛在關注鳥種的撞擊影響評估) (WavesCan Ecology Ltd. , 2025)
- Formosa 1 offshore windfarm
  - EIA report (海洋竹南離岸式風力發電計畫環境影響說明書) (Unitech New Energy Engineering Co., Ltd, 2014)
  - EIA deviation report (環境影響差異分析報告) (Unitech New Energy Engineering Co., Ltd, 2015)
  - EIA deviation comparison report (環境影響說明書變更內容對照表) (Unitech New Energy Engineering Co., Ltd, 2016)
  - EIA 5th deviation report ((第 5 次變更) 環境影響差異分析報告) (Unitech New Energy Engineering Co., Ltd, 2017a)
  - EIA 6th deviation report ((第 6 次變更) 環境影響差異分析報告) (Unitech New Energy Engineering Co., Ltd, 2017b)
- Formosa 2 offshore windfarm
  - EIA report (海能離岸風力發電計畫環境影響說明書) (Unitech New Energy Engineering Co., Ltd, 2018)
  - EIA 1st deviation report (環境影響差異分析報告 (第一次變更-變更自設升壓站及陸纜路徑)) (Unitech New Energy Engineering Co., Ltd, 2019)
- Deshuai offshore windfarm EIA report (美森離岸風力發電場興建計畫環境影響說明書) (Unitech New Energy Engineering Co., Ltd, 2023b)
- Project's CHA (2025), which included the review of published data and literature:
  - Integrated Biodiversity Assessment Tool (IBAT) (https://www.ibat-alliance.org/)
  - International Union for Conservation of Nature (IUCN) Red List of Threatened Species (http://www.iucnredlist.org)
  - BirdLife International Data Zone (http://birdlife.org)
  - Biodiversity A-Z org (https://biodiversitya-z.org)
  - Catalogues of Life in Taiwan (https://taibnet.sinica.edu.tw/home_eng.php)
  - Convention on Biological Diversity (CBD) website (https://www.cbd.int/)
  - eBird (https://ebird.org)
  - Fishbase (https://fishbase.se)

  - The Amphibia Web
  - World Wildlife Foundation (WWF) Ecoregions (https://worldwildlife.org)
  - Important Bird and Biodiversity Areas (IBA) (http://datazone.birdlife.org/home)
  - Key Biodiversity Areas (KBA) (www.keybiodiversityareas.org/)
  - World Heritage Sites (WHS) (https://whc.unesco.org/en/list/)
  - UNESCO Biosphere Reserves (http://whc.unesco.org/en/statesparties/id)
- Map of Taiwan's Wetlands (https://wetland-tw.tcd.gov.tw/en/GuideMap.php)
- Habitat Protection in Taiwan (https://conservation.forest.gov.tw/habitat)
- Marine Protected Areas in Taiwan (https://www.oca.gov.tw/ch/home.jsp?id=197&parentpath=0,5 and https://www.fa.gov.tw/upload/466/20190417103933104 00.pdf)
- Protected Reef Areas and Artificial Reef Areas in Taiwan (https://www.fa.gov.tw/en/Reef/index.aspx)
- Fisheries Zones of Taiwan (https://www.fa.gov.tw/cht/ResourceFishRight/index.aspx)