

Fengmiao 1 Offshore Wind Farm Project Social Impact Assessment

Fengmiao Wind Power Co Ltd (preparatory office)

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Quality information

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Table of Contents

1. Introduction	1
1.1 Relevant Guidelines and Regulations.....	1
1.1.1 International performance standards and guidance	1
1.1.2 Local regulations	1
1.2 Document Structure.....	2
2. Project Description	3
2.1 Project Facilities	3
2.2 Project Activities	3
2.3 Workforce.....	5
2.4 Operations Nearby.....	6
3. Methodology	8
3.1 Scoping.....	8
3.1.1 Area of Influence.....	8
3.1.2 Identification of Receptors.....	9
3.1.3 Identification of Potential Impacts	9
3.2 Baseline Data Collection	10
3.3 Impact Assessment and Management Measures	10
3.3.1 Determining the Magnitude of Impact	11
3.3.2 Assess the Likelihood of Impact Occurrence	12
3.3.3 Map the Level of Impact Significance	12
3.4 Impact Management Measures.....	12
3.5 Assumption and Limitations.....	13
4. Social Baseline Analysis	14
4.1 Demographic Profile.....	14
4.2 Economy and Development.....	15
4.2.1 Employed Population Distribution.....	15
4.2.2 Industrial Development.....	16
4.3 Public Health.....	17
4.4 Land Use.....	17
4.5 Religion	19
4.6 Cultural Heritage.....	19
4.6.1 Onshore Cultural Heritage.....	19
4.6.2 Underwater Cultural Heritage.....	20
4.7 Ecosystem Services.....	20
4.7.1 Fisheries Activities	20
4.7.2 Local Tourism and Recreational Activities.....	24
4.8 Human Rights	24
5. Assessment of Social Impacts	27
5.1 Receptors.....	27
5.2 Types of Social Impacts	29
5.3 Impact on Community Health and Safety	30
5.3.1 Dust and Particulates Emissions	30
5.3.2 Noise and Vibration.....	33
5.3.3 Exposure to Diseases.....	35
5.3.4 Hazardous Materials and Waste	37
5.3.5 Electromagnetic Impact	38
5.3.6 Onshore Traffic Safety	39
5.3.7 Misconduct of Security Personnel.....	41
5.3.8 Emergency Events	42
5.4 Socio-Economic Impact.....	44
5.4.1 Employment.....	44
5.4.2 Fisheries Livelihood	45

5.4.3	Local Tourism.....	49
5.4.4	Cultural Heritage.....	50
5.4.5	Offshore Vessel Collision	52
5.4.6	Visual Landscape Quality	53
5.5	Impact on Infrastructure and Services.....	55
5.5.1	Road Service.....	55
5.5.2	Health Service.....	58
5.5.3	Waste Disposal Service.....	60
5.6	Impact on Labor and Working Condition	62
5.6.1	Work Force.....	62
5.6.2	Working Conditions and Management of Worker Relationship.....	63
5.6.3	Migrants Rights	66
5.6.4	Occupational Health and Safety	68
5.7	Summary of Social Impact Assessment.....	71
6.	Monitoring and Review	81
6.1	Monitoring Program.....	81
6.1.1	Internal Monitoring.....	81
6.1.2	External Monitoring.....	82
6.2	ESMS Audits.....	82
7.	Reference	83
8.	Disclaimer.....	84

Figures

Figure 1.	Project components of the FM1 Project.....	3
Figure 2.	Construction and Decommissioning Exclusion Zone.....	5
Figure 3.	OWF projects near the Taichung City	7
Figure 4.	Social Impact Assessment (SIA) Methodology	8
Figure 5.	The Aol of the Project	9
Figure 6.	Areas of Reserved Lands and Traditional Territories of Indigenous Peoples	15
Figure 7.	Land Use Nearby Project Facility	18
Figure 8.	Temples and Churches Nearby Project Facility.....	19
Figure 9.	Reported Fishing Activities in Taichung Waters.....	23
Figure 10.	Tourism Sites Located in The Coastal Areas of Taichung	24
Figure 11.	Snapshots of the Local Communities Northern of the Sanshun Road	27
Figure 12.	Clusters of Local Communities Nearby Project Facilities	28
Figure 13.	Sensitive Receptors Nearby Project Facilities	31
Figure 14.	Locations of Viewing Spots at Fengmiao Offshore Wind Farm	54
Figure 15.	Sensitive Roads Nearby Project Facilities	56
Figure 16.	Onshore Site Map.....	58

Tables

Table 1.	Regulations Addressing Social Issues in Taiwan	2
Table 2.	Planned Activities of the Project.....	4
Table 3.	Proposed Locations of Onshore Facilities	4
Table 4.	Exclusion Zone during Construction Phase.....	5
Table 5.	Development OWF Projects Nearby	7
Table 6.	Impact Mapping Framework	10
Table 7.	Issues of Concerned by Stakeholders	10
Table 8.	Magnitude Level.....	11
Table 9.	Factors Considered in Magnitude Evaluation.....	11
Table 10.	Numerical Rating of the Scales of Magnitude Factors	11

Table 11. Magnitude Evaluation Approach	12
Table 12. Definition of likelihood of Occurrence	12
Table 13. Social Impact Significance Matrix.....	12
Table 14. Population Table of Adjacent Areas to the Project Site in 2023.....	14
Table 15. Population Growth of Adjacent Areas to the Project Site during 2014-2023	15
Table 16. The labor Force Status and Indicators of the Population Aged 15 and above in Taichung City	16
Table 17. Taichung City's Employment Demographic Table at all Levels of Industry	16
Table 18. Registered Factories in the Project Aol in 2023	16
Table 19. Medical Resources in Taichung and within the Aol	17
Table 20. Top Five Causes of Death in Taichung and within the Aol.....	17
Table 21. Land Use Type Within the Aol	18
Table 22. Onshore Cultural Heritage Sites Adjacent to the Project's Aol	20
Table 23. Summary Table of Fishery in Taichung City.....	21
Table 24. Catch Value of Fishing Activities of Taichung in 2022	21
Table 25. Primary Reported Fishing Methods.....	21
Table 26. Demographic Information of Fishery Household Head / Vessel Owner	22
Table 27. Annual Household Income from Fisheries.....	22
Table 28. Domestic and Foreign Crew Members	23
Table 29. Tourism Sites Located in The Coastal Areas of Taichung.....	24
Table 30. The Project's Potential Human Right Issues.....	25
Table 31. Human Rights Legal and Institutional Framework.....	25
Table 32. Social Receptors and Impact Pathway	27
Table 33. Vulnerable Groups within the Aol	28
Table 34. Types of Social Impact.....	29
Table 35. Social Impact Significance Matrix of Dust and Particulates Emissions	32
Table 36. Mitigation Measures of Dust and Particulates Emissions.....	32
Table 37. Impact Assessment of Noise and Vibration	34
Table 38. Social Impact Significance Matrix of Noise Emission	34
Table 39. Social Impact Significance Matrix of Exposure to Diseases	36
Table 40. Social Impact Significance Matrix of Hazardous Materials and Waste.....	37
Table 41. Social Impact Significance Matrix of Electromagnetic Impact.....	39
Table 42. Social Impact Significance Matrix of Traffic Safety.....	40
Table 43. Social Impact Significance Matrix of Misconduct of Security Personnel	41
Table 44. Social Impact Significance Matrix of Emergency Events.....	42
Table 45. Mitigation Measures of Emergency Events.....	43
Table 46. Social Impact Significance Matrix of Fisheries Livelihood in Construction and Decommissioning Phases	46
Table 47. Social Impact Significance Matrix of Fisheries Livelihood in Operational phase.....	47
Table 48. Compensation and Funds for the Project.....	47
Table 49. Recommendations of Fishery Revitalization Initiatives	48
Table 50. Social Impact Significance Matrix of Cultural Heritage	51
Table 51. Social Impact Significance Matrix of Offshore Vessel Collision.....	52
Table 52. Social Impact Significance Matrix of Visual Landscape Quality.....	54
Table 53. Social Impact Significance Matrix of Transportation and Road (During Construction).....	57
Table 54. Social Impact Significance Matrix of Transportation and Road (During Operation).....	57
Table 55. Social Impact Significance Matrix of Health Service	59
Table 56. Social Impact Significance Matrix of Waste Disposal Service (During Construction).....	60
Table 57. Social Impact Significance Matrix of Waste Disposal Service (During Decommissioning).....	61
Table 58. Social Impact Significance Matrix of Work Force	62
Table 59. Social Impact Significance Matrix of Working Conditions and Management of Worker Relationship ..	64
Table 60. Mitigation Measures for Working Condition.....	65
Table 61. Social Impact Significance Matrix of Migrants Rights	67
Table 62. Risk Assessment of Occupational Health and Safety	68
Table 63. Social Impact Significance Matrix of Occupational Health and Safety	69
Table 64. Mitigation Measures of Occupational Health and Safety	70
Table 65. Summary of Social Impact Assessment	72

1. Introduction

The Fengmiao 1 Project (hereafter the Project) is located off the west coast of Taichung City, Taiwan. The Project's wind farm area is approximately 99.94 km² with water depths ranging from 52 to 64 m and at least 36 kilometers (km) away from the shoreline. The Project is anticipated to start construction works in 2025 and start operation in 2027 for 20 to 25 years.

In line of international advocacy for sustainable development, the report undertakes a systematic assessment to identify and evaluate the Project's social risk/impact and following a mitigation hierarchy, to develop relevant measures that aim avoid, minimize and where residual impacts remain, to compensate/offset for impacts to affected people, including workers and affected communities.

1.1 Relevant Guidelines and Regulations

1.1.1 International performance standards and guidance

The necessity of undertaking social impact assessment as well as the aspects of concerns are addressed primarily in international guidelines, namely IFC Performance Standards and Equator Principles, including:

- Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
- Performance Standard 2: Labor and Working Conditions
- Performance Standard 4: Community Health, Safety and Security
- Performance Standard 5: Land Acquisition and Involuntary Resettlement
- Performance Standard 8: Cultural Heritage
- Equator Principle 2: Environmental and Social Assessment
- Equator Principle 3: Applicable Environmental and Social Standards
- Equator Principle 4: Environmental and Social Management System and Equator Principles Action Plan
- Equator Principle 5: Stakeholder Engagement
- Equator Principle 6: Grievance Mechanism
- The Eight International Labour Organization's (ILO) Core Labor Standards

Please note that PS7 does not apply to the Project as the indigenous communities' traditional territory are not present within the project area. Further validation will be provided in section 4.1.

1.1.2 Local regulations

It is not mandatory in Taiwan to undertake a social impact assessment for a development project. However, certain regulations address social aspects related to the Project, as [Table 1](#).

Table 1. Regulations Addressing Social Issues in Taiwan

Topic	Regulation
The impact of environmental stressors on local communities	<ul style="list-style-type: none"> Environmental Impact Assessment Act (環境影響評估法) Implementation Rules of the Environmental Impact Assessment Act (環境影響評估法施行細則)
Impact on fishery	<ul style="list-style-type: none"> Fisheries Act (漁業法) Fisheries Compensation Benchmarks for Offshore Wind Farms (離岸式風力發電廠漁業補償基準)
Impact on cultural heritage	<ul style="list-style-type: none"> Cultural Heritage Preservation Act (文化資產保存法) Underwater Cultural Heritage Preservation Act (水下文化資產保存法)
Maritime traffic and transportation	<ul style="list-style-type: none"> SN.1/Circ.296: "Degree of Risk Evaluation" by the International Maritime Organization (IMO) IALA Recommendation O-134 on the IALA Risk Management Tool for Ports and Restricted Waterways by the International Association of Maritime Aids to Navigation and Lighthouse Authorities (IALA)
Aviation hazards	<ul style="list-style-type: none"> Potential aviation hazards posed by the development of offshore windfarms are assessed outside of the EIA process in Taiwan with consent from the Civil Aeronautics Administration

Source: Fengmiao I Supplementary Lenders Information Package Documentation – Scoping Report, by NIRAS, dated 26 April 2024.

1.2 Document Structure

This report exhibits the social assessment process and output and includes the following sections. Section 2 details relevant information of the Project, including project facilities, project activities, workforce arrangement and nearby projects. Section 3 proposes a methodological framework based on which the assessment will be carried out. Section 4 demonstrates social baseline information of people within the area of influence (Aol) from social, economic, and cultural aspects. Section 5 delineates the impact assessment results and the corresponding risk management measures.

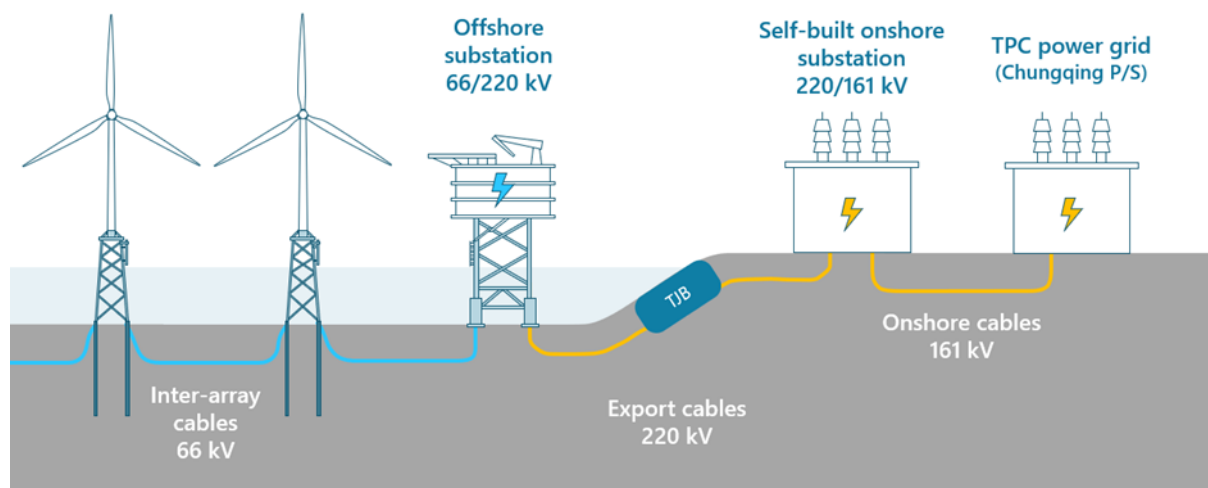
2. Project Description

The Project is located off the west coast of Taichung City, Taiwan. The Project's wind farm area is approximately 99.94 km² with water depths ranging from 52 to 64 m and at least 36 km away from the shoreline.

2.1 Project Facilities

The Project will comprise of the key components listed below and highlighted in **Figure 1**.

- 33 horizontal axis wind turbine generators (WTG);
- 66 kV buried inter array subsea cables;
- 66/220 kV offshore substation mounted on jacket foundations;
- 220 kV buried offshore export cables;
- 220/161 kV onshore self-built substation;
- 161 kV onshore export cables;
- Working dock at the Taichung Port for wind-turbine preassembly;
- Operation and Maintenance (O&M) facility; and
- O&M support vessels.



Source: Fengmiao I Supplementary Lenders Information Package Documentation - Climate Change Risk Assessment, by NIRAS, dated 12 July 2024.

Figure 1. Project components of the FM1 Project

2.2 Project Activities

The Project's activities will take place in three major phases, namely the construction phase, the operation phase and the decommissioning phase. Construction activities of the Project are planned to commence in 2025, lasting for 3 years till 2027. In 2027, the Project will start to operate for a period of 20 to 25 years, followed by decommissioning work. The planned activities throughout the project life cycle are described in **Table 2**. It is shown that the Project's activities involving major workforce mobilization, vessels/vehicles movements and construction/removal of facilities occur in the construction phase and in the decommissioning phase, whereas only occasional activities are foreseen in the operation phase.

Table 2. Planned Activities of the Project

Project Area	Activities in Construction Phase	Activities in Operation Phase	Activities in Decommissioning Phase
Onshore	<ul style="list-style-type: none"> Enabling work¹ Pre-assembly of wind nacelle and blade components Construction of transmission and distribution system Onshore substation installation 	<ul style="list-style-type: none"> Operation activities in offices, spare parts warehouses, and repair factories Occasional maintenance of substation 	<ul style="list-style-type: none"> Removal or re-use of land cables and substations Disposal of hazardous wastes Recycle of components/elements/parts
Offshore	<ul style="list-style-type: none"> Enabling work² Working vessels movements, e.g. transportation of components in/out of the Taichung Port Installation of foundation piles and casings Wind turbine installation On-site assembly of multiple structural support elements Offshore substation installation Submarine cables laying 	<ul style="list-style-type: none"> Occasional maintenance/ replacement of wind turbines. 	<ul style="list-style-type: none"> Removal of wind turbines, seabed foundation, submarine cables and offshore substation. Shipping of parts/elements back to the shore If the infrastructure has become a habitat for marine life, retaining the structures foundation in situ would be an option to consider.

Source: Fengmiao I Supplementary Lenders Information Package Documentation - Climate Change Risk Assessment, by NIRAS, dated 12 July 2024; EIA for Fengmiao Offshore Wind Farm, by CIP, dated 11 May 2023.

The proposed locations of onshore facilities are summarized in **Table 3**.

Table 3. Proposed Locations of Onshore Facilities

Facilities	Location
Self-built substation	Qingshui District
Export cables connecting substation to the power grid of Taiwan Power Co. (TPC)	Chungqing Substation (中清變電所)
Factories for the wind nacelle and blade preassembly	Prioritize to use Taichung Port
Designated working dock for component transportation	Prioritize to use Taichung Port
O&M facilities (office, warehouses and repair factories)	Changhua Port / Prioritize to use Taichung Port

Security arrangements will be put in place for the Project, both onshore and offshore. Onshore wise, all sites will have security fencing with signage posted. Security will be present at site at all times with authorized access only given to workers and delegated visitors, such as delivery drivers. Offshore wise, arrangement varies subject to project phases. In the construction and decommissioning phases, only vessels and personnel who are authorized to enter the wind farm construction zones will be given access to enter and this will be controlled via a Marine Coordination Centre. All vessels will be tracked via an electronic system. There will be Guard Vessels placed at strategic points across the wind farm who will alert non-authorized vessels. Other alert systems such as Notice to Mariners and Stakeholder Engagement will be advertised to inform non-project personnel that activities are happening in the wind farm area. A construction exclusion zone will be established and maintained around the installation area to ensure navigational safety, providing a buffer between open sea and the construction zones. This exclusion zone will encompass the wind farm area, the export cables area, and a 500-meter buffer zone (**Figure 2**). The location of this exclusion zone will be dynamically adjusted according to the construction progress. Once implemented, fishing and marine traffic will be prohibited from passing through, and the integrity of the exclusion zone will be maintained by guard vessels. Relevant information of the approved project area as well as the construction area are summarized in **Table 4**. During operation, a Marine Coordination Centre will manage offshore operations and will additionally post Notice to Mariners. This will be managed in a similar way to construction but scaled back relative to the size and frequency of operations occurring in the wind farm area.

¹ Enabling work include activities that facilitate onshore facilities design and construction.

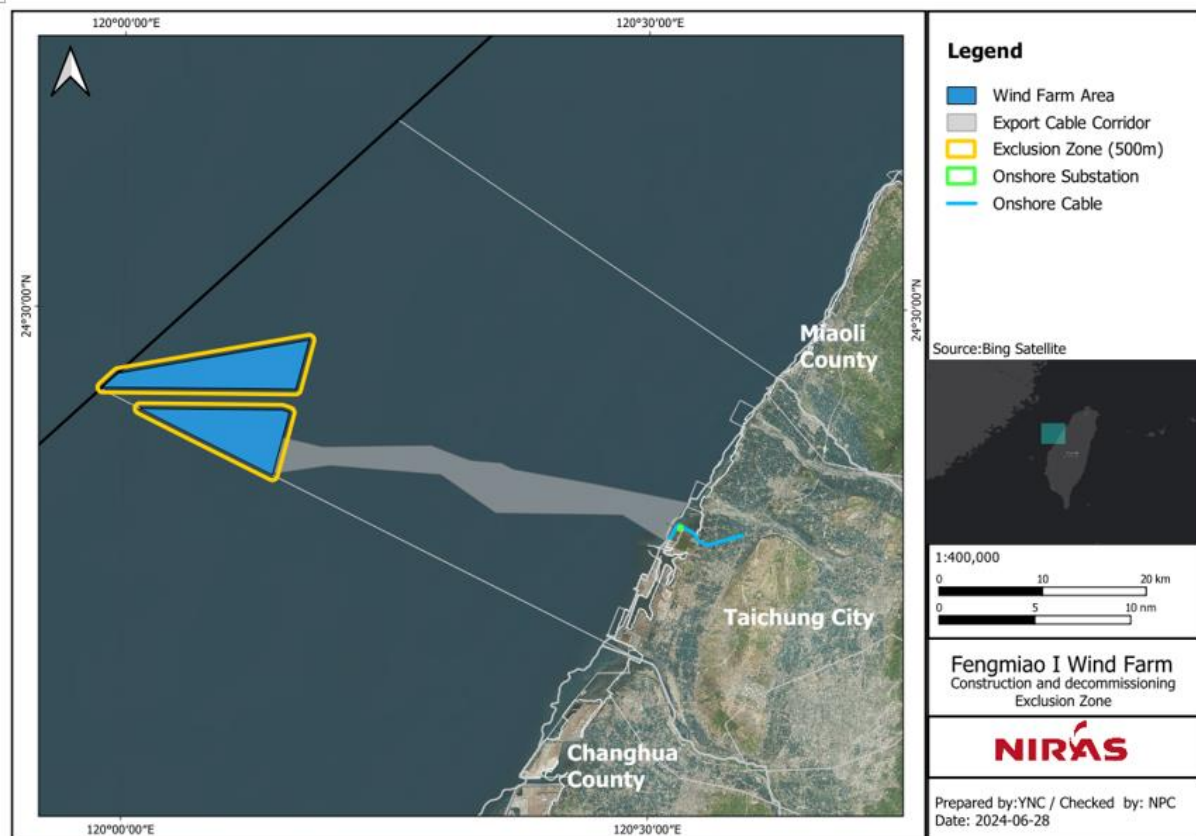
² Enabling work include activities that facilitate offshore facilities design and construction.

All office locations are subjected to restricted access mechanisms, e.g. entry door cards, and only authorized personnel are allowed to enter. No workers or security personnel will be armed given the level of risk associated with the operation areas. Security personnel will be given training on access and egress arrangements and how to treat people with dignity. All contractors have signed up to ESG clauses and Code of Conduct as part of the contract. Security arrangements will also be included as part of the project induction.

Table 4. Exclusion Zone during Construction Phase

	Windfarm (km ²)	Cables corridor (km ²)	Total area (km ²)	Comments
Approved Wind Farm Area	99.94	52.57	152.51	Area approved by Taiwan authorities, includes non-developed areas
Windfarm construction area (restricted area during construction)	The designated construction area includes a 500-meter safety buffer. The wind farm area, including the 500m buffer and taking into account the navigation channel on the west side of the wind farm, is 132.1 km ² . For safety reasons, the Zone Nautical (ZN) authority mandates that all vessels steer clear of this area during the construction phase. Furthermore, the area is subdivided into sub-areas based on the construction schedule.			

Source: Supplementary Lenders Information Package Documentation - Fishery Livelihood and Restoration Plan, by NIRAS, dated 20 September 2024.



Source: Supplementary Lenders Information Package Documentation - Fishery Livelihood and Restoration Plan, by NIRAS, dated 20 September 2024.

Figure 2. Construction and Decommissioning Exclusion Zone

2.3 Workforce

During the construction period, the peak daily construction manpower required is about 100 persons, approximately 0.03% of the number of residents in the administrative districts of the Project's Aol (Section 4.1). Since most of the project works are commissioned by domestic civil engineering, hydropower, machinery, electrical and other industries except for technical work, local labor will be resourced as priority workforce.

For onshore cables and onshore substation installation work, hiring priority will be given to local manpower and contractors. Some of the workforce may not be locals and the numbers of which are yet to be confirmed.

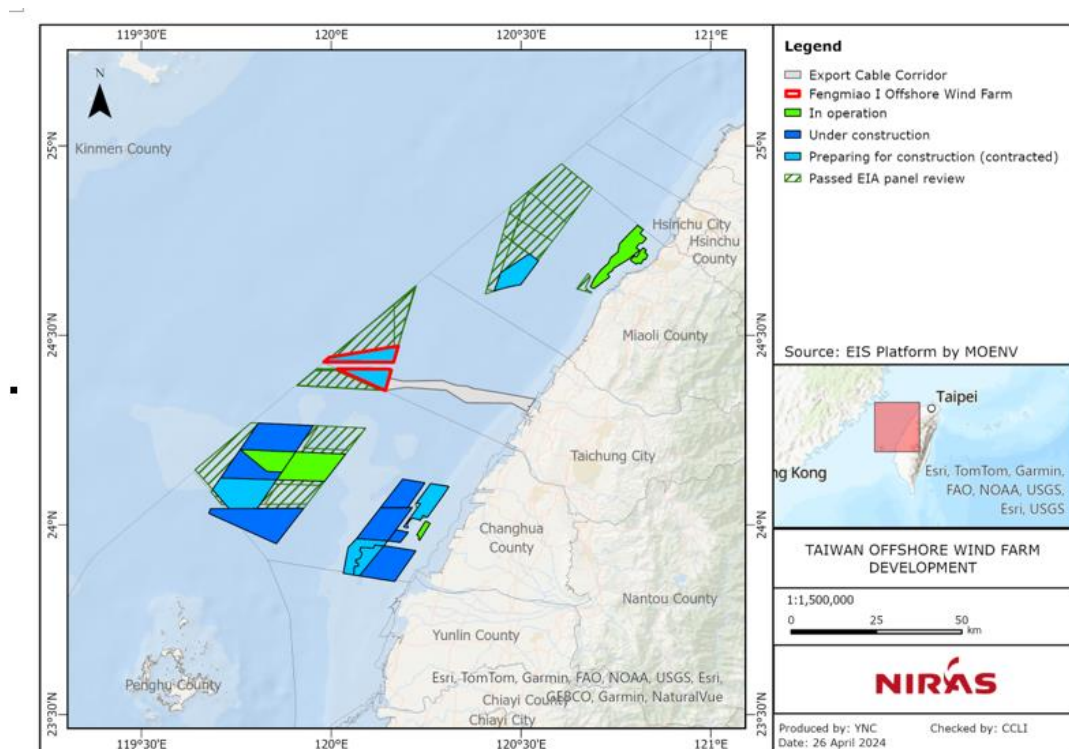
Accommodation will only be provided to FEM1 personnel on an ad-hoc basis and this will be for occasional visits to site locations or contractors yards like South Korea, Vietnam etc. All accommodation provided will be on an approved list and will be hotels at 4- or 5-star level. Indirect workers, such as personnel of contractors and sub-contractors may be given accommodation as part of their working arrangements. Contractors will be asked to provide information regarding accommodation and will be subject to ongoing inspections by FEM1. In addition to accommodation, contractors will be asked to supply information regarding personnel – where they are from and contractual arrangements.

2.4 Operations Nearby

There are currently 18 offshore wind farm (OWF) projects in the vicinity of the Project, which are in the stage of operation, under construction, or preparing for construction. These projects are located in Changhua County and Miaoli County, Taiwan, and relevant details of these projects are summarized in [Table 5](#) and illustrated in [Figure 3](#). In addition, near these established projects, more projects are anticipated to enter the development pipeline in the coming years. This suggests that consideration must also be given to cumulative social impacts that could result from the combined effect of similar actions by multiple projects.

Table 5. Development OWF Projects Nearby

Item	Project name	Development stage	Size of development	Location
1.	Hai-Neng Project	In operation	Capacity 387MW (No 5) Capacity 378 MW (No 6)	Miaoli, Taiwan
2	Ocean Zhu-Nan OWP Plan	In operation	Capacity 128 MW	
3	Formosa 4	Contracted	Capacity of 495 MW	
4	Hai-Yang Project	In operation	Capacity 128 MW	Changhua, Taiwan
5	TPC OWF Plan (Phase 1)	In operation	Capacity 110 MW	
6	Great Changhua SE OWF Plan	In operation	Capacity of 605 MW	
7	Changhua/Zhang-Fang OWP Plan	In operation	Capacity of 552 MW	
8	Changhua Xidao OWP Plan	In operation	Capacity of 600MW	
9	Great Changhua SW OWF Plan	Stage 1: In operation Stage 2: Under construction	Stage 1: Capacity of 294 MW Stage 2: 337.1 MW	
10	Great Changhua NW OWF Plan	Under construction	Capacity of 582.9 MW	
11	TPC OWF Plan (Phase 2)	Under construction	Capacity of 194.5 MW	
12	Chong Neng OWF Plan	Under construction	Capacity of 450 MW	
13	Hai Ding OWF Plan (Farm No. 2)	Contracted	Capacity of 600 MW	
14	Hai Long II OWP Plan	Under construction	Capacity 696 MW	
15	Hai Long III OWP Plan	Under construction	Capacity 512 MW	
16	Strait OWF Plan	Under construction	Capacity 600 MW	
17	Wei Lan Hai OWP Plan	Contracted	Capacity of 440 MW	

Source: <https://www.windtaiwan.com/Windfarm.aspx>Note: The wind farms' statuses are presented at the time of writing (26th April 2024).⁴⁴

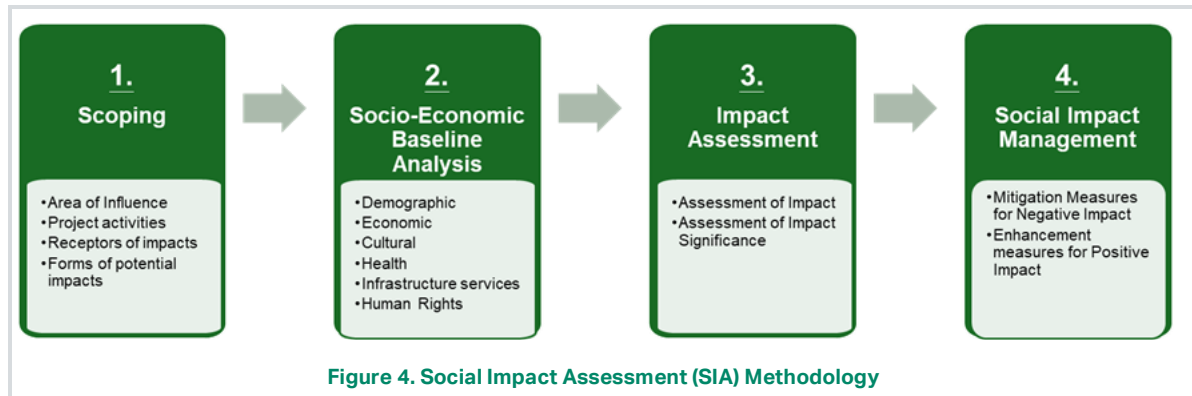
Source: Supplementary Lenders Information Package Documentation - Climate Change Risk Assessment, by NIRAS, dated 12 July 2024.

Figure 3. OWF projects near the Taichung City

3. Methodology

Social Impact Assessment (SIA) is a process for the identification, analysis, assessment, management and monitoring of the social impacts of a project, both positive and negative. The social impacts of a project are the direct and indirect impacts that affect people and their communities at all phases of the project lifecycle.

The SIA is employed by the following procedure shown in **Figure 4**.



3.1 Scoping

Scoping is the process of identifying the main issues of concern and determining the interested and affected parties. It is a preliminary process that produces an interim list of issues to be considered, which are later properly assessed (IAIA, 2015). The inputs to scoping in this report come from the following sources: 1) related documentation, e.g., assessment reports of the Project; 2) desktop review of empirical literatures and policy guidelines; and 3) professional judgement.

3.1.1 Area of Influence

According to IFC Performance Standard 1, the area of influence (AoI) encompasses, as appropriate:

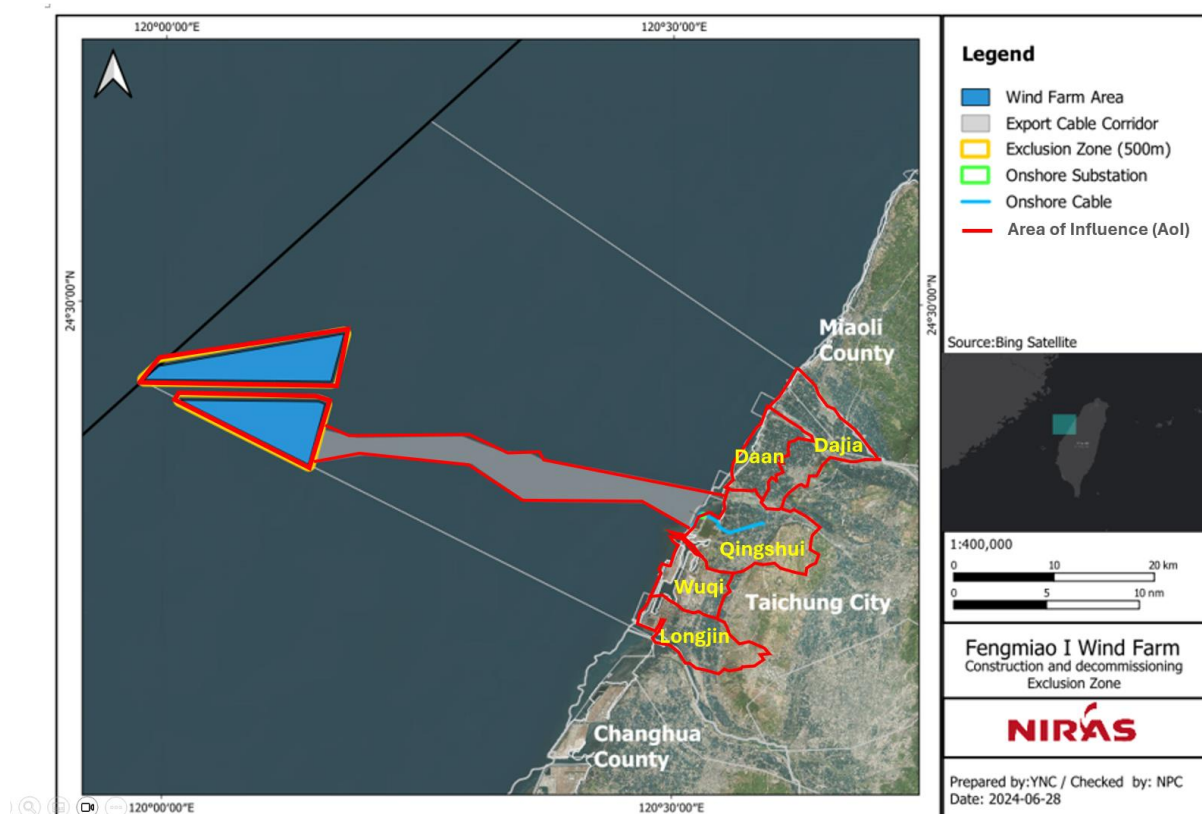
The area likely to be affected by: 1) the Project and the client's activities and facilities that are directly owned, operated or managed, including by contractors, and that are a component of the Project; 2) impacts from unplanned but predictable developments caused by the Project that may occur later or at a different location; 3) indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent.

Associated facilities, which are facilities that are not funded as part of the Project and that would not have been constructed or expanded if the Project did not exist and without which the Project would not be viable.

Cumulative impacts that result from the incremental impact, on areas or resources used or directly impacted by the Project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted.

Considering the previous aspects as well as the Project's stakeholder mapping outcomes and where EIA defines as project area, it is determined that the Project's area of influence includes (as shown in **Figure 5**):

1. The area within the Project site, i.e. where the onshore and offshore components/facilities locate and vessel transportation routes. This covers approximately 257 km².
2. The surrounding area of the Project, which encompasses the local communities and districts where human activities may be directly, indirectly or cumulatively affected by the Project's activities. The area includes coastal administrative districts in Taichung, specifically Dajia, Daan, Qingshui, Wuqi, and Longjing District.



Source: Graphic adopted from the report 'Supplementary Lenders Information Package Documentation – Climate Change Risk Assessment' (by NIRAS, dated 12 July 2024) and modified by AECOM.

Figure 5. The Aol of the Project

3.1.2 Identification of Receptors

Social receptors refer to individuals, sociocultural groups, and community organizations or entities. They can include service users, employees, community residents, specific neighborhoods, visitors, or businesses. The report identifies social receptors from a pre-identified list of stakeholders and only considers those directly or indirectly affected by the Project. In addition, the report pays attention to the vulnerable groups among the receptors, such as disabled people, elderly individuals, women, migrant workers, and indigenous people. Receptors identified are detailed in [Section 5.1](#).

3.1.3 Identification of Potential Impacts

A comprehensive mapping framework has been established to facilitate the impact identification process. The framework is shown in [Table 6](#) and covers four major impact categories, including: 1) community health, safety and security; 2) socio-economic matters; 3) supply and quality of infrastructure services; and 4) the Project's workers' rights.

Please note that this report considers impact mainly during the construction and the operation phases of the Project. This is because the social context of the Aol during the decommissioning phase is currently unknown, which undermines the value of any assessment results for the development of mitigation measures. Besides, a decommissioning management plan for the Project is not yet in place due to the lack of local regulatory requirements and the uncertainty of decommissioning works. Therefore, it is suggested that the Project should undertake an SIA of the decommissioning activities and prepare corresponding measures 2 years before the decommissioning work begins.

In previous sessions, it has been noted that cumulative social impacts resulting from the combined effect of similar actions by multiple projects can occur over time. However, at this point, impacts from other projects are unknown to the Project, making it impossible to fully understand the scale of cumulative impacts. The cumulative

impacts of OWF projects remain a concern, and it will require collaborative efforts of all project owners to discuss potential negative influences on the communities as project development progresses.

Table 6. Impact Mapping Framework

Impact Category	Types of Impacts to be Considered
Community Health, Safety and Security	<ul style="list-style-type: none"> • Various health impact induced by the Project's activities • Impact of emergency events on local communities • Mismanagement of the Project's activities on local communities
Social-Economic	<ul style="list-style-type: none"> • Change in employment opportunities • Impact on direct livelihood • Impact on local business • Impact on cultural heritage • Impact on the rights of marginalized group, i.e. indigenous people • Impact on local aesthetic assets
Infrastructure Service	<ul style="list-style-type: none"> • Impact on local health supply and service • Impact on road service quality and transportation service
Labor and Working Condition	<ul style="list-style-type: none"> • Engagement of child labor and forced labor • Poor working conditions • Unsafe and unhealthy working environment for workers

During the impact mapping process, stakeholders' opinions gathered in stakeholder engagement activities will be thoroughly taken into account in order to ensure these concerns are properly addressed in the assessment. The issues of concern raised by stakeholders are summarized in **Table 7** below.

Table 7. Issues of Concerned by Stakeholders

Stakeholder	Issues of Concern
Scholars	<ul style="list-style-type: none"> • The risk of ship collisions of fishing vessels with wind turbines and how to prevent them. • Fishermen's rights and interest
Residents/Communities	<ul style="list-style-type: none"> • The impact on fishing activities

Source: Human Rights Impact Screening Report (Draft), September 3rd, 2024

3.2 Baseline Data Collection

It is crucial to establish a social baseline of the Project's Aol in order to make informed decisions and document social changes. The baseline data collection involves gathering and recording pre-impact state information of key social indicators/variables within the Aol. Data will be sourced from publicly available databases and the fishery survey conducted by the Project. The types of information of interest include:

- Socio-demographic profiles
- Economic activities and standard of living
- Health and wellbeing
- Supply of infrastructure services
- Human rights conditions

Further details of the social baseline analysis will be provided in **Section 4**.

3.3 Impact Assessment and Management Measures

The impact assessment must also consider impact significance. In this report, an impact significance assessment analyzes the extent to which potentially impacted people and communities may be affected, positively or negatively, before implementation of any mitigation measures. This assessment aims to identify negative impacts so mitigating measures can be planned and implemented. Social impacts that are deemed

“positive” after assessment will not be the primary focus of the significance rating and yet enhancement measures will be proposed.

Significance rating for a given type of impact will be undertaken in the following steps:

1. Determine the magnitude of the impact.
2. Assess the likelihood of occurrence.
3. Map the level of significance of the impact.

3.3.1 Determining the Magnitude of Impact

This report classifies the magnitude of impacts into four scales: negligible, minor, moderate, and major. These levels are defined in **Table 8**. When evaluating the magnitude of impacts, three factors are considered: geographic extent, intensity, and duration. These factors considered in the magnitude scales are shown in **Table 9**. Each of the four magnitude scales is assigned a value range to represent its aggregate levels of extent, intensity, and duration. The aggregate magnitude scale of an impact is the sum of associated ratings of extent, intensity, and duration. Details of the rating are defined in **Table 10**. The value of the aggregate magnitude can range from 3 to 12. This report assigns a value range for each magnitude scale based on professional judgment, as exhibited in **Table 11**. For example, if an impact’s geographical extent is specific to households (rating as “1”), impact intensity is not observable (rating as “1”), and the duration is only temporary (rating as “1”), the value sum is 3, indicating the magnitude level is “negligible”.

Table 8. Magnitude Level

Magnitude level	Meaning
Negligible	The change that occurs remains within the range commonly experienced by receptors.
Minor	There is a perceptible difference or change from the baseline conditions. The impact affects communities/businesses at the local level and occurs over a short period of time.
Moderate	The difference or change from the baseline conditions is evident. The receptors experience the impact over a long period of time.
Major	There is a significant change from the baseline conditions. The impact is persistent.

Reference: *Hai Long Offshore Windfarm – Social Impact Assessment by ERM, dated 1 August 2023.*

Table 9. Factors Considered in Magnitude Evaluation

Factor	Scale (Definition)			
Geographics Extent	Household	District	City	Region
Intensity	None (No impact)	Low (No substantial effects)	Medium (Moderate effects)	High (Extensive effects)
Duration	Temporary (<1 year)	Short-term (1-5 years)	Long-term (Project lifecycle)	Permanent

Reference: *Social Impact Assessment Guideline, by the Queensland Department of State Development, Infrastructure, Local Government and Planning, March 2018; Hai Long Offshore Windfarm – Social Impact Assessment by ERM, dated 1 August 2023.*

Table 10. Numerical Rating of the Scales of Magnitude Factors

Scale Rating	Scale of Geographics Extent	Scale of Intensity	Scale of Duration
1	Household	None	Temporary
2	District	Low	Short-term
3	City	Medium	Long-term
4	Region	High	Permanent

Table 11. Magnitude Evaluation Approach

Magnitude Level	Value Range (Extent + Intensity+ Duration)
Negligible	3
Minor	4-6
Moderate	7-8
Major	9 and above

3.3.2 Assess the Likelihood of Impact Occurrence

There is not standard in likelihood rating. Referring to common practices in rating risk likelihood, this report considers a four-scale likelihood rating approach as shown in **Table 12**.

Table 12. Definition of likelihood of Occurrence

Likelihood Scale	Likelihood level	Meaning
Low	Between 0.1% and 10%	Could occur in some circumstances, but would be surprised if it happens
Medium	Between 10% and 40%	Might occur in some circumstances
High	Between 40% to 99.9%	Is expected to occur in most circumstances. Not surprised if it happens
Definite	100%	Is expected to occur and is almost inevitable

3.3.3 Map the Level of Impact Significance

Impact significance is evaluated by considering the interaction of magnitude of an impact and its likelihood of occurrence. The significance assessment matrix, where the levels of significance are categorized in five different scales, namely extremely low, low, medium, high, and extremely high, is exhibited in **Table 13**.

Table 13. Social Impact Significance Matrix

		Magnitude of Impact			
		Negligible	Minor	Moderate	Major
Likelihood of Occurrence	Definite	Medium	High	High	Extremely High
	High	Low	Medium	High	High
	Medium	Low	Medium	Medium	High
	Low	Extremely Low	Low	Low	Medium

3.4 Impact Management Measures

After assessing the impacts, it is necessary to develop management strategies/programs. Important considerations when formulating management measures include:

- Exploring all reasonable measures related to project design, location, consultation, and implementation to avoid negative social impacts.
- Avoiding or minimizing negative impact in accordance with the mitigation hierarchy.
- Enhancing positive benefits and project opportunities for the affected parties.
- Establishing and implementing appropriate feedback and grievance mechanisms.
- Ensuring that the management measures are focused on outcomes, reasonable, relevant, transparent, and can be monitored.
- Addressing any residual impacts and determining how to deal with them.

3.5 Assumption and Limitations

This section outlines all assumptions and limitations associated with this assessment.

- This assessment report is based on the information provided by the Client and publicly available data. It is assumed that the input materials are accurate and complete.
- The accuracy of this report depends on the quality and availability of the relevant data provided.
- Subjective to the availability of public data, some baseline data shown in section 4 can only be presented at the Taichung City level data while others include information at district level.
- Assume that no significant deviation of the Project's activities from planning will be foreseen. Should a major deviation happen, the SIA would need to be updated.

4. Social Baseline Analysis

In this section, the social baseline of the Aol will be presented. Onshore wise, the Aol covers the coastal administrative districts of Dajia, Daan, Qingshui, Wuqi, and Longjing, where primary land-based construction work and operational activities will take place. Offshore wise, the Aol refers to the exclusion zone.

The social baseline analysis provides a reference point against which the impacts of the Project can be assessed. The analysis will include community demographics, economy and development, public health, land use, ecosystem services, cultural norms, and human rights.

4.1 Demographic Profile

As of 2023, the population of Taichung City was 2.85 million, with approximately 1.06 million households according to the Civil Affairs Bureau, Taichung City Government (**Table 14**). The onshore facilities of the Project will pass through Qingshui District (清水區), and the coastal areas near the wind farm include the districts of Wuqi, Dajia, Daan, Qingshui, and Longjing. In year 2023, the population of these districts ranged from 18,073 to 89,924 (persons). While the female population exceeds the male population, with a gender ratio of 95.7 (males to females) in Taichung City as a whole, this trend is reversed in the aforementioned districts.

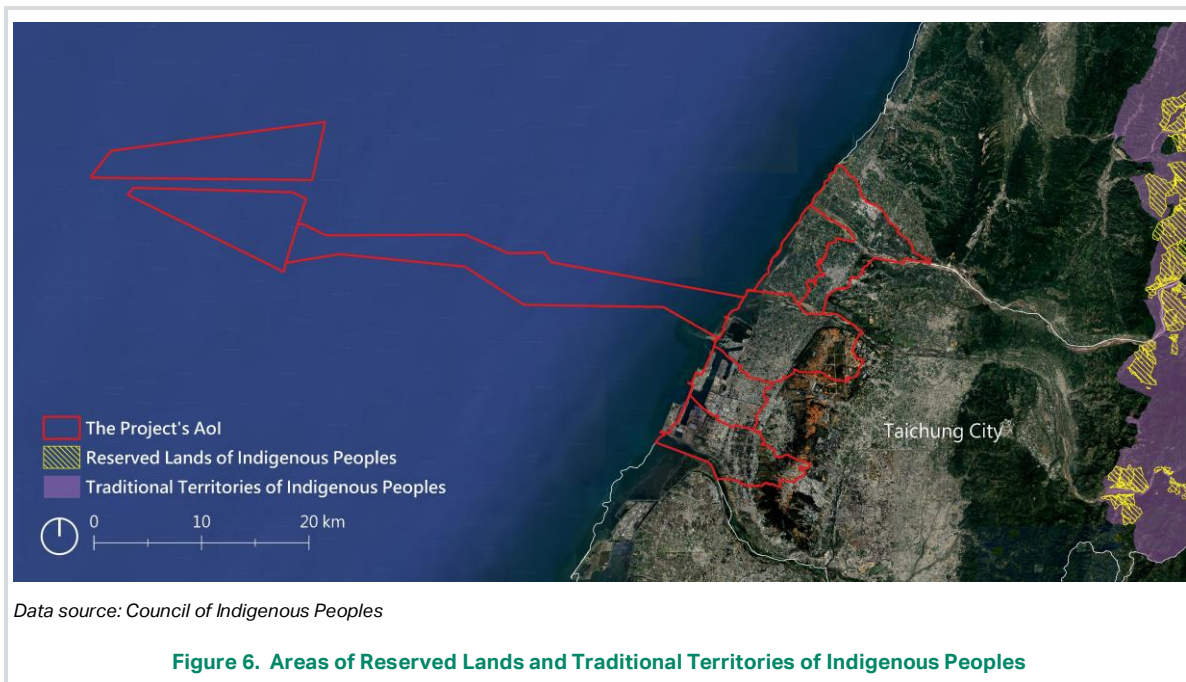
Table 14. Population of Adjacent Areas in the Project Site in year 2023

Area	Population (person)	Gender Ratio (M/F)	Age Distribution			Old-age dependency ratio	Child dependency ratio	Density (person /km ²)	Households	Indigenous population (person)
			0~14	15~64	65 and over					
Taichung City	2,845,909	95.70	13.3%	70.9%	15.8%	22.26	18.72	1,285	1,059,625	37,667 (1.3%)
Dajia District	74,684	100.20	13.6%	69.1%	17.3%	25.09	19.71	1,276	24,676	346 (0.5%)
Daan District	18,073	111.16	8.9%	71.6%	19.5%	27.14	12.48	660	5,741	70 (0.4%)
Qingshui District	89,924	103.79	12.6%	70.5%	16.9%	23.97	17.84	1,401	32,178	873 (1.0%)
Wuqi District	61,019	100.00	14.4%	71.0%	14.6%	20.57	20.25	3,675	20,715	1,027 (1.7%)
Longjing District	78,413	100.60	12.9%	73.1%	14.0%	19.17	17.64	2,061	25,830	1,198 (1.5%)

Source: Budget, Accounting and Statistics office (BAS) of Taichung City Government, 2023, <https://govstat.taichung.gov.tw/DqbasWeb/Default.aspx>, retrieved on 23 September 2024.

According to the year 2023 population age distribution statistics of Taichung City, 13.3% of the population is under 15 years old, 70.9% is between 15 and 64 years old, and 15.8% is over 65 years old. Notably, Dajia, Daan, and Qingshui have higher old-age dependency ratios than the city average. By contrast, Dajia and Wuqi have higher child dependency ratios compared to the overall city average.

In the aforementioned districts, indigenous people constitutes approximately 0.4% to 1.7% of the population. However, as demonstrated in **Figure 6**, these areas are not officially designated as traditional territory of indigenous communities or reserved land of indigenous peoples, and no indigenous tribes are present in these districts.



The average population growth rate of Taichung City in the past ten years (2014-2023) is approximately 8.77%, as shown in **Table 15**. Specifically, in the areas adjacent to the Project site, the growth rates over the same period vary: Daan District experiences a significant decline trend and an average growth rate of -13.44%, while the remaining areas show positive growth. This indicates that there is an exodus of people from Daan.

The population changes observed in Taichung City's coastal areas over the past decade reflect a complex interplay of economic, social, and infrastructural factors. Investments in infrastructure, such as the Taichung Port Technology Industrial Park, Taichung International Airport Gateway Special Zone, and Taichung Port Offshore Wind Power Industrial Park, have created more job opportunities and enhanced the appeal of certain districts, thereby contributing to population growth. By contrast, Daan and Dajia face challenges such as a high proportion of agricultural lands (over half), aging population and lack of diverse job opportunities which unavoidably lead to population decline.

Table 15. Population Growth of Adjacent Areas to the Project Site during 2014-2023

Year	Taichung City (Person)	Dajia (Person)	Daan (Person)	Qingshui (Person)	Wuqi (Person)	Longjing (Person)
2014	2,719,835	77,607	19,654	85,957	56,643	76,164
2023	2,845,909	74,684	18,073	89,924	61,019	78,413
2014-2023 Average growth rate (‰)	8.77403	0.69454	-13.44393	4.07799	11.56129	12.25879

Source: BAS of Taichung City Government, 2023, <https://govstat.taichung.gov.tw/DqbasWeb/Default.aspx>, retrieved on 23 September 2024.

4.2 Economy and Development

4.2.1 Employed Population Distribution

The labor force population comprises individuals aged 15 and older who are both capable and willing to work and are seeking gainful employment. According to annual statistics report from the Taichung City Government, as of year 2023, the population of individuals aged 15 and above in Taichung City was 2,427,000 persons. Of this population, 1,427,000 persons are considered part of the labor force, resulting in an employment rate of 96.5%. **Table 16** presents a decade-long comparison, showing a slight increase in the employment rate over this period.

Table 16. The labor Force Status and Indicators of the Population Aged 15 and above in Taichung City

Year	Total Population (person)	Over 15 years old (person)	Labor force (person)			Employment Rate (%)
			Employed	Unemployed	Sum	
2014	2,710,000	2,261,000	1,285,000	53,000	1,338,000	96.0
2023	2,833,000	2,427,000	1,427,000	52,000	1,478,000	96.5

Source: BAS of Taichung City Government, 2023, <https://govstat.taichung.gov.tw/DgbasWeb/Default.aspx>, retrieved on 22 October 2024.

As of year 2023, Taichung City's employed population primarily works in the secondary and tertiary industries (**Table 17**). The total employed population in the city was 1,426,000 persons, with an unemployment count of 52,000 persons. The workforce engaged in the primary industry numbered approximately 36,000 persons, representing about 2.52% of the total employed population. In contrast, the secondary sector employed 539,000 persons, representing 37.8% of the total employed population, while the tertiary sector accounted for 851,000 workers, or 59.68%. This distribution highlights the city's economic reliance on industrial and service-oriented activities, underscoring the limited role of the primary sector in the local economy.

Table 17. Taichung City's Employment Demographic Table at all Levels of Industry

Year	Primary Industry		Secondary Industry		Tertiary Industry		Total Population
	Persons	%	Persons	%	Persons	%	
2014	40,000	3.12	519,000	40.48	723,000	56.40	1,282,000
2023	36,000	2.52	539,000	37.80	851,000	59.68	1,426,000

Source: BAS of Taichung City Government, 2023, <https://govstat.taichung.gov.tw/DgbasWeb/Default.aspx>, retrieved on 22 October 2024.

4.2.2 Industrial Development

According to the Fishery Livelihood and Restoration Plan (hereafter FLRP), while Taichung boasts one of the fastest growing and most diversified economies in Taiwan, economic development is predominantly concentrated in the urban core. The coastal administrative districts of Taichung (Dajia, Daan, Qingshui, Wuqi, Longjing) are considerably less developed compared to central Taichung, with local economies primarily focusing on manufacturing, general services, and agriculture. In 2022, the total production value of Taichung's agricultural sector, including fisheries, was NTD 37,159,500,000. Of this, NTD 422,752,020, or 1.3%, came from fisheries.

According to the Project's EIA, there were 118,354 persons registered industrial and commercial businesses in 2020. Among these, 73,574 persons were categorized under the wholesale and retail sector as well as the accommodation and catering industries. Additionally, the total number of registered factories in 2020 was 19,155. Within this total, 6,751 factories were involved in metal products manufacturing, and 4,448 factories were engaged in machinery and equipment manufacturing and repair.

According to the annual statistics report from the Taichung City Government, the number of registered factories in the coastal area is presented in **Table 18**. The total number of registered factories in these regions is 2,689, accounting for approximately 14% of all factories in Taichung City. Among these, Dajia and Longjing districts have the highest number of registered factories. The predominant industries in these factories include metal products, machinery, and plastic products, which is generally consistent with the industrial composition across the entire city.

Table 18. Registered Factories in the Project Aol in 2023

	Taichung City	Dajia	Daan	Qingshui	Wuqi	Longjing
Registered factories	19,095	797	192	439	517	744
Proportion	100%	4.17%	1.01%	2.30%	2.71%	3.90%

Source: BAS of Taichung City Government, 2023, <https://govstat.taichung.gov.tw/DgbasWeb/Default.aspx>, retrieved on 23 September 2024.

4.3 Public Health

Based on the data by Ministry of Health and Welfare (MOHW) (2023), there are 65 hospitals and 3,622 clinics in Taichung City, with 39,220 registered health professionals and 22,425 beds in total. Within the Aol, there are 5 hospitals and 138 clinics, with 2,944 registered health professionals and 2,071 beds, which is detailed in **Table 19**.

Table 19. Medical Resources in Taichung and within the Aol

Area	Hospital (no. of hospital)	Clinic (no. of clinic)	Registered Health Professional (person)	Bed (no. of bed)	Population (person)
Taichung City	65 (100%)	3,622 (100%)	39,220 (100%)	22,425 (100%)	2,845,909 (100%)
Aol Total	8 (12%)	223 (6%)	3,600 (9%)	2,615 (12%)	322,113 (11%)
Dajia District	3	82	644	544	74,684
Daan District	0	3	12	0	18,073
Qingshui District	2	70	363	549	89,924
Wuqi District	3	22	2,423	1,497	61,019
Longjing District	0	46	158	25	78,413

Note: The percentage stands for the proportion to Taichung City.

Source: Ministry of Health and Welfare, 2023, <https://dep.mohw.gov.tw/DOS/lp-5099-113.html>, retrieved on 22 August 2024.

According to MOHW, in Taichung City and within the Aol, approximately 27% of people died of cancer, which is the leading cause of death. The top five causes of death are demonstrated in **Table 20**. In the past 20 years, lung cancer, liver cancer and colorectal cancer have become the top three causes of cancer death in Taiwan.

Table 20. Top Five Causes of Death in Taichung and within the Aol

Area	Cancer (person)	Heart disease (person)	Pneumonia (person)	Diabetes (person)	Cerebrovascular disease (person)	Total Death (person)
Taichung City	5,718 (27.4%)	1,681 (8.1%)	1,630 (7.8%)	1,550 (7.4%)	1,199 (5.8%)	20,839 (100%)
Aol Total	745 (27.6%)	194 (7.2%)	227 (8.4%)	171 (6.3%)	181 (6.7%)	2,699 (100%)
Dajia District	193 (27.5%)	55 (7.8%)	59 (8.4%)	28 (4.0%)	51 (7.3%)	702 (100%)
Daan District	55 (30.2%)	15 (8.2%)	15 (8.2%)	10 (5.5%)	11 (6.0%)	182 (100%)
Qingshui District	214 (26.4%)	61 (7.5%)	74 (9.1%)	59 (7.3%)	53 (6.5%)	810 (100%)
Wuqi District	126 (30.6%)	26 (6.3%)	27 (6.6%)	25 (6.1%)	31 (7.5%)	412 (100%)
Longjing District	157 (26.5%)	37 (6.2%)	52 (8.8%)	49 (8.3%)	35 (5.9%)	593 (100%)

Note:

1. The top 3 leading causes are marked with green.

2. The percentage stands for the proportion of each cause to the total death of area.

Source: Ministry of Health and Welfare, 2023, <https://dep.mohw.gov.tw/DOS/lp-5069-113.html>, retrieved on 22 August 2024.

4.4 Land Use

By 2020, as indicated in the Project's EIA, registered lands in Taichung City occupy about 210,124.68 ha of area. Among the registered lands, 65.11% are public lands, 34.58% are private lands, and 0.31% are co-owned by the government and private entities. Urban lands account for 25.18%, and non-urban lands account for 74.82%.

Based on the data by Ministry of the Interior (MOI) (2023), the top 3 categories of land use in Taichung City are agriculture land (25.65%), building land (24%), and forest land (15.19%), while the top 3 categories of land use within the Aol are agriculture land (36.94%), irrigation and drainage land (16.85%), and building land (15.95%). For the details, please refer to **Table 21**.

Table 21. Land Use Type Within the Aol

Area	Agriculture Land	Building Land	Forest Land	Transportation Land	Irrigation & Drainage Land	Public Used Land	Recreation Land	Mining & Salt Industry Land	Other	Total
Taichung City	25.65%	24.00%	15.19%	14.79%	7.10%	4.24%	2.73%	0.09%	6.22%	100%
Aol Total	36.94%	15.95%	4.04%	15.11%	16.85%	2.42%	0.85%	0.11%	7.73%	100%
Dajia District	53.22%	14.81%	3.20%	8.31%	12.20%	1.53%	0.77%	0.10%	5.86%	100%
Daan District	54.37%	7.92%	1.05%	4.72%	23.93%	0.57%	0.54%	0.33%	6.56%	100%
Qingshui District	33.85%	13.06%	7.06%	20.44%	15.87%	1.22%	1.07%	0.15%	7.29%	100%
Wuqi District	14.82%	23.62%	0.61%	33.27%	19.35%	1.82%	1.44%	0.00%	5.06%	100%
Longjing District	25.24%	22.31%	4.54%	10.23%	17.23%	6.96%	0.45%	0.01%	13.03%	100%

Note: The top 3 categories are marked with green.

Source: Ministry of the Interior, 2023, <https://data.gov.tw/dataset/168851>, retrieved on 13 September 2024.

The land use plan which governs the areas where onshore facilities of the Project will be located is the Taichung Harbor Special District Plan (臺中港特定區計畫). As shown in the figure below, the onshore self-built substation and the onshore export cables are located on the land registered as “District Used for Harbour (港埠專用區)”, and the cables connecting the substation and the TPC Chongqing P/C are planned to laid down underneath existing roads, i.e. Huangang North Road, Sanshun Road and Lingang Road (Section 7).

As exhibited in **Figure 7** below, the primary land use surrounding the Project’s facilities are primarily “Agricultural District (農業區)” and “District Used for Harbour (港埠專用區)”. The proximity of the Project’s onshore cables to the nearest residential district is at least 1.2 km and around 3 km between the substation and the residential district. Sensitive receptors near the project facilities will be reported in **Figure 13**.



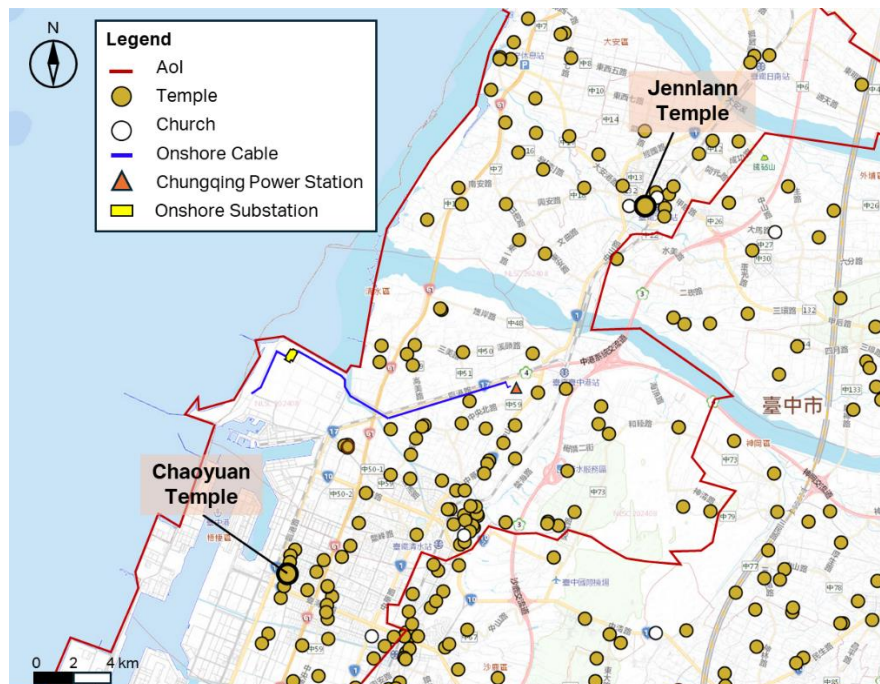
Source: Urban and Rural Development Branch (URDB), National Land Management Agency (NLMA), MOI, <https://nsp.tcd.gov.tw/ngis/>, retrieved on 23 October 2024. FM1, provided on 22 October 2024.

Figure 7. Land Use Nearby Project Facility

4.5 Religion

According to the 2022 Taiwan Social Change Survey, if only a single faith can be chosen, 25% of people in Taiwan consider themselves to believe in traditional folk religions, 24.5% believe in Buddhism, 20.8% believe in Taoism, and 20.5% have no religious beliefs. Based on the data by MOI (2023), there are 984 temples and 183 churches in Taichung City, which account for 84% and 16% respectively.³

Located nearby the coast, the early residents of the Aol started out in the fishery activities. Either cross-sea trading or fishing, people would pray to Mazu, the most influential goddess of the sea, for peace and smooth sailing. The important religious centers include Chaoyuan Temple (朝元宮) in Wuqi District and Jennlann Temple (鎮瀾宮) in Dajia District, as shown is **Figure 8**.



Source: <https://kiang.github.io/religions/>, retrieved on 21 October 2024.

Figure 8. Temples and Churches Nearby Project Facility

4.6 Cultural Heritage

4.6.1 Onshore Cultural Heritage

Based on the cultural heritage data published on the Bureau of Cultural Heritage (BOCH) website, the EIA report presents a compilation of cultural heritage sites within the Project's Aol. No known tangible or intangible cultural heritage has been identified within the Project site. The administrative districts adjacent contain six monuments, nine historical buildings, one building settlement, and two archaeological sites (refer to **Table 22**). Notably, the only historical building located within 500 meters of the Project site is the Taiwan Port Authority's Zhugang Road Deputy Director's Japanese-style Dormitory.

³ <https://ws.moi.gov.tw/001/Upload/400/refile/0/4405/48349492-6f8c-453b-a9d1-4a8f0593b979/year.html>, retrieved on 19 August 2024.

Table 22. Onshore Cultural Heritage Sites Adjacent to the Project's Aol

Category	Name	Location (District)
Historical Building	Taiwan Port Authority's Zhugang Road Deputy Director's Japanese-style Dormitory	Wuqi
	Yungning Public School Dormitory	Wuqi
	Dazhuang Haotian Shrine	Wuqi
	Gaomei Lighthouse	Qingshui
	Qingshui Dai Yang Yuan US Military Oil Storage Facility	Qingshui
	Aofeng Mountain Military Camp and Remains of the former Qingshui Shrine	Qingshui
	Japanese-style dormitory complex of Qingshui Public School	Qingshui
	Qingshui Earthquake Memorial	Qingshui
	Qingshui Station on the Coastal Section of the Trunk Line Railway	Qingshui
Monuments	Qingshui Huang Family Jingyuan	Qingshui
	Qingshui Shekou Yang Residence	Qingshui
	Qingshui Public School	Qingshui
	Former Wuqi Police Substation and Dormitory Complex	Wuqi
	Wuqi Zhenwu Temple	Wuqi
	Longjing Lin Residence	Longjing
Building settlement	Former Qingshui Xinyi New Village	Qingshui
Archaeological sites	Niumatou Archaeological Site	Qingshui
	Qingshui Zhongsha Archaeological Site	Qingshui

Source: EIA for Fengmiao Offshore Wind Farm, May 11, 2023.

Wuqi District currently has two notable folk customs related to its intangible heritage:

- The return procession and tour of Dazhuang Mazu from Beigang pilgrimage
- The Wuqi Sedan Chair Parade

According to the Project's EIA, the routes of these two activities held in 2020 did not pass through the locations of the Project's planned onshore facilities.

4.6.2 Underwater Cultural Heritage

According to the Project's EIA results, there are no listed or suspected underwater cultural heritage sites within the Project's sea area.

4.7 Ecosystem Services

4.7.1 Fisheries Activities

• Fishery development in Taichung City

The FLRP reports a comprehensive understanding of fisheries activities in Taichung City, including:

- **Fishery demographics:** As of 2022 there were 4,195 registered fishermen in Taichung City. Of the active fishermen in Taichung City, 2,516 are engaged in fishing activities, with 2,452 (approximately 97%) involved in coastal fisheries and 47 (approximately 2%) in offshore fisheries. From 2018 to 2022,

the number of registered migrant fishery workers in Taichung ranged from 172 to 211, total number of migrant crew was 252 persons in 2023. (refer to **Table 23**)

- **Catch value:** In 2022, Taichung City's total fishery quantity caught was 2,063 metric tons, a decrease of 22 metric tons compared to the previous year. Total value of catch was NT\$417,075,000 in 2022. Offshore fisheries accounted for NT\$258,283,000, representing 62% of the total value. (refer to **Table 24**)

Primary fishing methods: Gillnet (刺網) is the primary fishing method in Taichung, accounting for 53.5% of fishing methods. This was followed by angling gear (一支釣) at 38.4% and set net (定置網) at 3.1%. (refer to **Table 25**)

Table 23. Summary Table of Fishery in Taichung City

Year	Registered Fishermen (person)	Active Fishermen (person)	Offshore Fishery (person)	Coastal Fishery (person)	Inland Culture (person)	Migrant Crew (person)	Total Value of Catch (in Thousand NT\$)	Total Quantity Caught (in metric tons, MT)
2018	4,387	2,639	61	2,555	23	211	326,379	1,928
2019	4,338	2,600	63	2,514	23	206	447,520	2,079
2020	4,304	2,582	54	2,511	17	200	458,251	1,837
2021	4,259	2,031	41	1,973	17	172	422,752	2,085
2022	4,195	2,516	47	2,452	17	201	417,075	2,063

Source: Supplementary Lenders Information Package Documentation - Fishery Livelihood and Restoration Plan, by NIRAS, dated 20 September 2024.

Table 24. Catch Value of Fishing Activities of Taichung in 2022

Fishing Activities	Total	Offshore Fisheries	Coastal Fisheries	Inland Culture	Ornamental Fish Breeding
Catch Value (in Thousand NT\$)	417,075	258,283	136,953	2,988	18,851
Percentage (%)	100	61.93	32.83	0.72	4.52

Source: Supplementary Lenders Information Package Documentation - Fishery Livelihood and Restoration Plan, by NIRAS, dated 20 September 2024.

Table 25. Primary Reported Fishing Methods

Fishing methods	Frequency (time)	Percentage (%)	Cumulative Percentage (%)
Angling gear	61	38.4	38.4
Small and medium trawl	4	2.4	40.8
Gill net	85	53.5	94.3
Set net	5	3.1	97.4
Misc. fish long line	2	1.3	98.7
Pot fishing	2	1.3	100.0
Total	159	100.0	-

Source: Supplementary Lenders Information Package Documentation - Fishery Livelihood and Restoration Plan, by NIRAS, dated 20 September 2024.

• **Summary of fishery household**

Coastal and offshore fishermen and their households are identified as the Project Affected Persons (PAPs) of the Project, referring to the FLRP report. A questionnaire survey was administered in 2024 to provide essential socio-economic baseline data. The data sample includes 133 members of the Taichung Fishery Association

(TFA) and was collected from four local TFA branches. The key findings from the data collection are summarized below:

- **Demographic information:** The FLRP provides baseline demographic data (refer to [Table 26](#)) of fishery household heads and or vessel owners registered with the TFA.
- **Fishery related income:** The annual household fishing income for participants ranged from NT\$ 25,000 to 16,000,000, with an average yearly income of NT\$ 1,978,008 per household. The income distribution indicates that the modal income, i.e. the most frequently reported value, falls between NT\$ 2,100,000 and 3,000,000 (refer to [Table 27](#)).
- **Vessel ownership and crew members:** Out of the 133 households surveyed, 112 reported owning at least one vessel, while the remaining households owned more than one vessel. Among these households, approximately 48.9% employ domestic crew members. On average, each vessel employs about 1 domestic crew member and 0.3 foreign crew members (refer to [Table 28](#)). The average annual salary expenditure for domestic crew members was NT\$ 469,091 per crew member, while for foreign crew members it was NT\$ 1,442,222 per crew member. According to the TFA, discrepancy in salary expenditure for domestic and foreign crew members can be attributed to contract and work stipulations; domestic workers are more likely to work part time in a commission or short-term contract capacity, whereas foreign crew members tend to have full-time long-term contracts yielding higher yearly salaries.
- **Locations of Fishing Activities:** The acquired fishing activity data is illustrated in [Figure 9](#) by the FLRP. The baseline data indicate that the highest levels of fishing activity are concentrated within and around the original TFA exclusive fishing zone, as well as in the adjacent protective reef zones. Survey respondents reported low to medium levels of fishing activity in the vicinity of the wind farm and cables landing area.

Table 26. Demographic Information of Fishery Household Head / Vessel Owner

Indicator	Result of survey
Gender	The gender balance of the participants in this survey is 15 (11.3%) females to 118 (88.7%) males.
Age	The age range of the survey participants spans from 24 to 81 years old, with an average age of 54.6 years old. Only 29.3% (39 persons) of the household heads (or vessel owners) are under 50 years old. 32.4% (43 persons) are over 60 years old.
Marital Status	Only 5.3% (7 persons) of the household heads (or vessel owners) are single. Married respondents account for (85.7%) of all samples. 8% (12 persons) are divorced or widow.
Industrial Experience	Among the questionnaire participants, those with under 10 years of fisheries experience accounted for 24.8% of respondents, while 49 respondents (36.8%) possess over 25 years of experience.
Educational Background	The most frequent response was senior/vocational high school, accounting for 43.6% of responses, followed by junior high school at 25.6%. There were 2 master's and no doctoral-level responses for this survey
Disability Status	Statistics indicate that 7 (5.3%) of household heads (vessel owners) respondents have disability cards.
Indigenous Status	2.3% of household head (or vessel owner) respondents were recorded as having an indigenous identity
Employment Outside of Fisheries	Among the 133 participants of this survey, 53 fishery household heads or vessel owners (39.8% of respondents) hold additional jobs outside of fisheries operations. This equates to 60.2% of the respondents being specialized fishery workers

Source: Supplementary Lenders Information Package Documentation - Fishery Livelihood and Restoration Plan, by NIRAS, dated 20 September 2024.

Table 27. Annual Household Income from Fisheries

Fishing income (NT\$)	Frequency (time)	Percentage (%)
<500,000	22	16.5
500,000~1000,000	29	21.8
1100,000~2,000,000	27	20.3

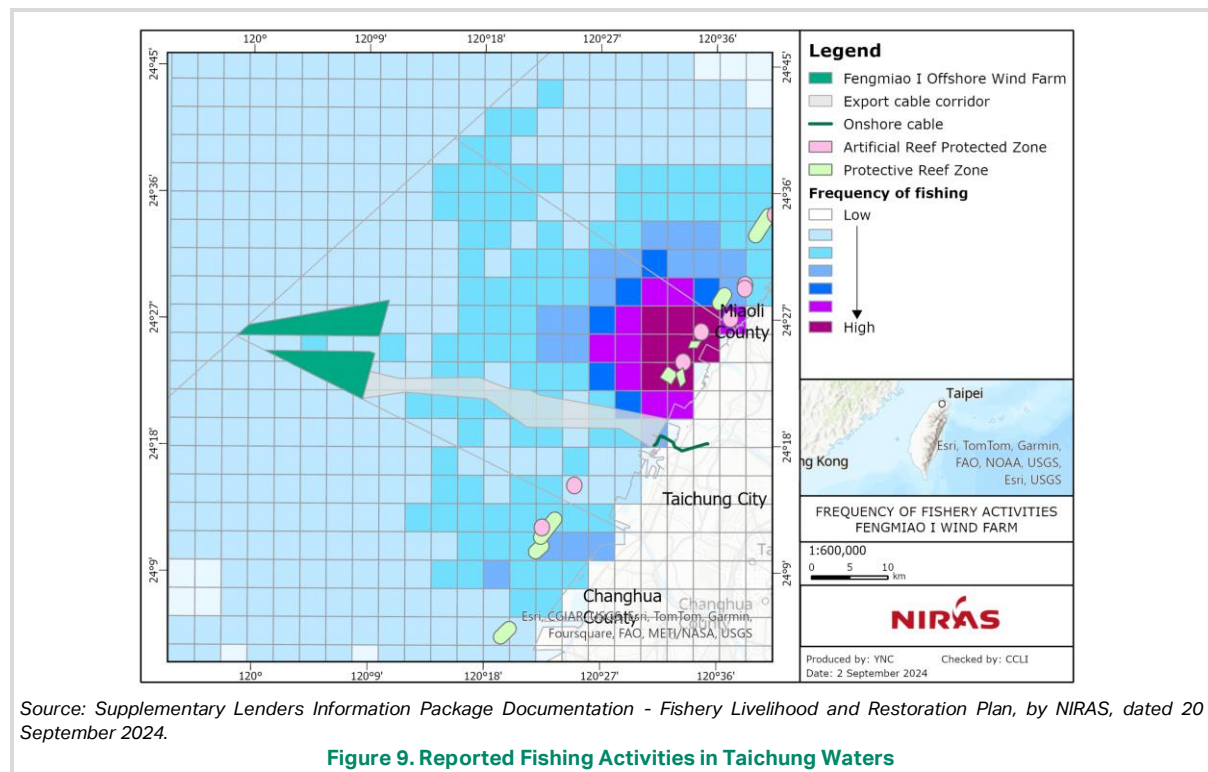
Fishing income (NT\$)	Frequency (time)	Percentage (%)
2,100,000~3,000,000	34	25.6
3,100,000~4,000,000	15	11.3
4,100,000~5,000,000	1	0.7
>5,100,000	5	3.8
Total	133	100.0

Source: Supplementary Lenders Information Package Documentation - Fishery Livelihood and Restoration Plan, by NIRAS, dated 20 September 2024.

Table 28. Domestic and Foreign Crew Members

Number of crew members employed (person)	Response Frequency (time)	Percentage (%)	Number foreign crew members employed (person)	Response Frequency (time)	Percentage (%)
0	68	51.1	0	124	93.2
1	25	18.8	1	2	1.5
2	18	13.6	3	2	1.5
3	17	12.7	6	3	2.2
4	2	1.5	7	1	0.8
5	2	1.5	8	1	0.8
7	1	0.8	Total	133	100.0
Total	133	100.0	-	-	-

Source: Supplementary Lenders Information Package Documentation - Fishery Livelihood and Restoration Plan, by NIRAS, dated 20 September 2024.



Source: Supplementary Lenders Information Package Documentation - Fishery Livelihood and Restoration Plan, by NIRAS, dated 20 September 2024.

Figure 9. Reported Fishing Activities in Taichung Waters

4.7.2 Local Tourism and Recreational Activities

The Project site is situated off the coast of Taichung City and at least 36 kilometers away from the shoreline. The coastal areas, in addition to residential settlements and industrial parks, are predominantly characterized by low-density development, including fishing ports and coastal terrain. This coastal region offers expansive views, allowing visitors to experience diverse weather conditions and scenic sunsets. The Project’s EIA identifies several notable tourism sites located in the coastal areas of Taichung, as listed below (Table 29). These sites offer a diverse combination of natural beauty and recreational opportunities, contributing to the popularity of Taichung’s coastal regions as a tourist destination. Since 2007, onshore wind turbines have been established successively in the Quingshui, Dajia, and Daan districts, becoming integral components of the surrounding landscape.

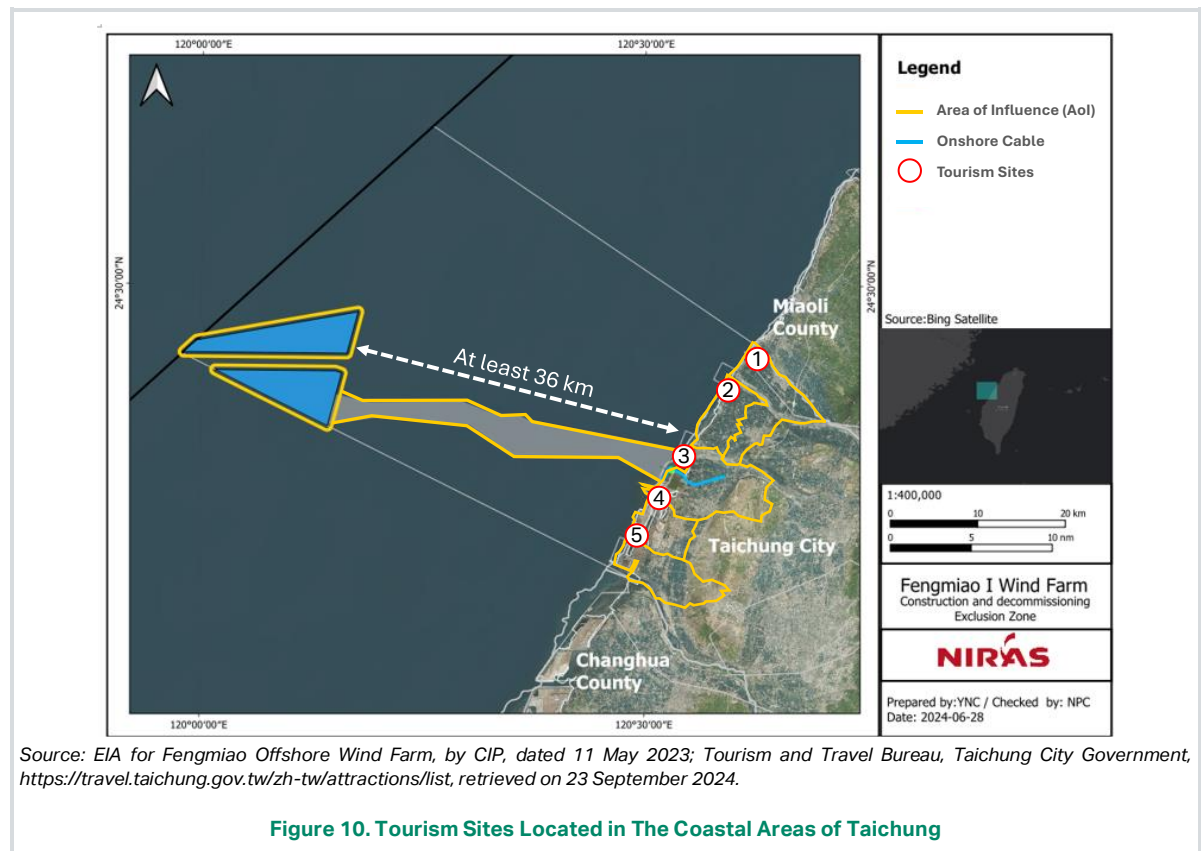


Table 29. Tourism Sites Located in The Coastal Areas of Taichung

Area	Tourism Site	Tourism Relative Activities
Daan District	①Taichung Coastal Bicycle Path	Cycling tour, sightseeing
Daan District	②Daan Coastal Park	Surfing, kitesurfing, SUP, glamping
Quingshui District	③Gaomei Wetlands	Ecological experience tour, birdwatching
Wuqi District	④Wuqi Fish Market	Recreational fishery, catering
Wuqi District	⑤Mitsui Outlet Park	Shopping, boat and yacht tours

Source: EIA for Fengmiao Offshore Wind Farm, by CIP, dated 11 May 2023; Tourism and Travel Bureau, Taichung City Government, <https://travel.taichung.gov.tw/zh-tw/attractions/list>, retrieved on 23 September 2024.

4.8 Human Rights

According to the Project’s Human Rights Impact Screening (HRIS) report, the stakeholders in human rights issues include workers (those employed by suppliers, the Project, and its network companies) as well as the surrounding communities. The report identifies forced labor, occupational health and safety (OHS), and working

conditions as high-risk concerns in comparison to other issues within CIP and its network companies, particularly due to the nature of work in the offshore wind farm industry. For suppliers, risks related to OHS, the right to health, and the right to life and security are also highlighted as significant. The identified potential high-risk human rights issues associated with vulnerable groups within the Project are summarized in **Table 30**.

Table 30. The Project's Potential Human Right Issues

Human Rights Issues	Description	Potential Vulnerable Groups
Forced labor	Severe economic exploitation or under menace of any penalty and for which the person has not voluntarily offered themselves. E.g., identity documents and passport of the worker were kept by the company; recruitment fees were collected from workers to hiring agent.	<ul style="list-style-type: none"> • Migrant workers
Occupational health and safety (OHS)	The Project should provide safe and healthy working conditions to workers reducing accidents and injuries to health arising in the course of employment, and to minimize the causes of inherent workplace hazards.	<ul style="list-style-type: none"> • Workers in the field (including workers in supply chain and migrant workers) • Communities
The right to health	Individuals have the right to the highest attainable standard of physical and mental health.	<ul style="list-style-type: none"> • Workers in the field (including workers in supply chain and migrant workers) • Workers hired through agency • Communities
The right to life and security	Individuals have the right not to be deprived of life arbitrarily or unlawfully.	<ul style="list-style-type: none"> • Workers in the field (including workers in supply chain and migrant workers) • Workers hired through agency • Communities
Working conditions	The project should provide workers with fair wages and equal remuneration for work of equal value and flexibility to start and end the workday.	<ul style="list-style-type: none"> • Workers hired through agency • Female worker • Worker with disabilities

Source: Fengmiao Offshore Wind Farm Project in Taiwan - Human Rights Impact Screening Report (Draft), by KPMG, dated 3 September 2024.

• **Local legal context**

For the issues identified as high risk, an overview of essential human rights covenants, laws and regulations that apply to the Project and its supply chain is provided in According to the HRIS, the Labor Standards Act (LSA) applies to approximately 95% of the labor force across majority of industries in Taiwan, including the Project. Issues covered by the LSA include labor contract, wages, working hours, recess, and holidays, child workers and female workers, retirement, and compensation for occupational accidents. It is worth noting that in Taiwan, labor, safety, and health documents comply with both the UNGPs and the ILO Core Labor Standards. By adhering to the regulatory requirements in Taiwan, the Project can ensure the protection of workers and the safeguarding of their human rights in accordance with globally recognized standards.

Table 31 as a basic context and condition of human rights. Note that the international human rights instruments listed are ratified by the countries where the suppliers and contractors are headquartered (i.e., Denmark, Belgium, and the UK).

According to the HRIS, the Labor Standards Act (LSA) applies to approximately 95% of the labor force across majority of industries in Taiwan, including the Project. Issues covered by the LSA include labor contract, wages, working hours, recess, and holidays, child workers and female workers, retirement, and compensation for occupational accidents. It is worth noting that in Taiwan, labor, safety, and health documents comply with both the UNGPs and the ILO Core Labor Standards. By adhering to the regulatory requirements in Taiwan, the Project can ensure the protection of workers and the safeguarding of their human rights in accordance with globally recognized standards.

Table 31. Human Rights Legal and Institutional Framework

Human Rights Issues	Regulations in Taiwan	International Instruments
Forced labor	<ul style="list-style-type: none"> • Human Trafficking Prevention Act • Review Standards and Employment Qualifications for Foreign Workers Engaging in Work Specified in 	<ul style="list-style-type: none"> • Forced Labor Convention, 1930 (ILO No. 29) (and its 2014 Protocol) • Abolition of Forced Labor Convention, 1957 (ILO No. 105)

Human Rights Issues	Regulations in Taiwan	International Instruments
	Subparagraphs 8 to 11, Paragraph 1, Article 46 of the Employment Service Act	
Occupational health and safety	<ul style="list-style-type: none"> Occupational Safety and Health Act Act for Protecting Worker of Occupational Accidents 	<ul style="list-style-type: none"> Maritime Labour Convention 2006 (MLC) The International Convention for the Safety of Life at Sea 1974 (SOLAS)
Right to health	Environmental Impact Assessment Act	The International Convention for the Prevention of Pollution from Ships 1973 (MARPOL)
Right to life and security of person	Labor Standards Act	Convention Against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (CAT), New York, 10.12.1984
Working conditions	<ul style="list-style-type: none"> Labor Standards Act Employment Service Act 	<ul style="list-style-type: none"> Minimum Age Convention, 1973 (ILO No. 138) Equal Remuneration Convention, 1951 (ILO No. 100) International Covenant on Economic, Social and Cultural Rights (ICESCR), New York, 16.12.1966

Source: Fengmiao Offshore Wind Farm Project in Taiwan - Human Rights Impact Screening Report (Draft), by KPMG, dated 3 September 2024.

• **Migrant worker in Taiwan**

It is important to note that the rights of migrant workers are currently under discussion in Taiwan. According to the HRIS, migrant workers involved in manufacturing at offshore wind farms fall under the LSA and Review Standards and Employment Qualifications for Foreign Workers Engaging in Work Specified in Subparagraphs 8 to 11, Paragraph 1, Article 46 of the Employment Service Act. However, migrant fishermen working on vessels and foreign household workers often receive lower pay than Taiwan's basic wage. Additionally, these migrant workers are at risk of exploitation and may incur debt during the recruitment process, as it is common for agencies in Taiwan to charge them fees.

Based on data from the Ministry of Labor (MOL), there are 793,544 migrant workers in Taiwan by July 2024.⁴ According to the National Immigration Agency (NIA), MOI, there are more than 87,576 missing migrant workers⁵, i.e. almost 11 % of the migrant workers are missing in Taiwan. Among the missing migrant workers, 2,654 workers (about 3 %) are in the construction sector. The missing migrant workers can pose an issue to human rights violations as it is difficult to track and follow when they are not working at the designated site.

• **Human right issues in wind energy industry**

According to HRIS, the Project encompasses wind power services, generation, construction, and maintenance. These activities involve common occupational health risks, including working at heights, over-exertion, slip and falls, being struck by objects, moving machinery, exposure to dust, confined spaces, and excavations. These risks can significantly impact workers' well-being and safety.

Besides, the HRIS indicates that workers stationed at offshore substations face specific health risks related to temperature, electromagnetic fields, noise from operating wind turbines, exposure to both direct and alternating currents, and various chemicals. The rights to health and life represent both potential and actual adverse impacts on human rights, which require urgent attention.

The information regarding labor law violations of the main contractors and the suppliers of the Project over the past 3 years is not available in the HRIS at the time of this assessment.

⁴ <https://statfy.mol.gov.tw/index12.aspx>, retrieved on 23 September 2024.

⁵ <https://www.immigration.gov.tw/5385/7344/7350/8943/?alias=settledown>, retrieved on 23 September 2024.

5. Assessment of Social Impacts

This section exhibits the SIA results.

5.1 Receptors

The social receptors identified in this report, along with their associated impact pathways, are described in **Table 32**. Local communities refer to residents and business owners within the Project's AoI. As mentioned in Section 4.4, the closest residential district is around 1.2 km from the Project's facilities (the cables). Several small clusters of local communities are scattered in the immediate vicinity of the Project's cables, as shown in **Figure 12** below.

Figure 11 shows that the nearest local communities are situated northern of Sanshun Road (三順路). This area includes a couple of local businesses and several traditional residential houses, all located within 300 meters of the cables along the Sanshun Road (三順路).



Source: Google Streetview

Figure 11. Snapshots of the Local Communities Northern of the Sanshun Road

Table 32. Social Receptors and Impact Pathway

Social receptors	Description	Impact pathway
Fishermen, self-employed and hired	People who rely on fishing as a source of income and operate fisheries within the Project's AoI, i.e. within the coastal area of Taichung City	The Project development restricts fishing activities.
Project workforce	Workers who will be hired by the Project, including supply chain, during the construction, the operation and the decommissioning phases	Mismanagement of the Project's activities or poor working conditions may cause harm on hired workers.
Local communities	People located as residents or running businesses in the administrative districts where onshore activities will take place, including Dajia, Daan, Qingshui, Wuqi and Longjing.	Environmental stressors or inappropriate actions resulting from the Project's activities may have impact on local communities.
Infrastructure service providers	The road transportation system, which is located in the Qingshui District, the Wuqi District and the Longjing District of Taichung City and will provide access to onshore construction sites Hospitals and clinics in adjacent areas	Excessive traffic caused by onshore construction activities may result in poor road service quality. The influx of the Project workforce may put pressure on the supply of health service.
Local businesses	They may be local tourist operators and local amenity service providers who may indirectly benefit from providing services to the Project's workforce.	Indirect impact may come from consumption contributed by the Project workforce. The project may attract tourism activities.
Other businesses	Aviation service providers and maritime service providers whose operating routes partially overlap with the Project's AoI.	The Project may cause maritime or aviation accidents.



Source: Google Earth.

Figure 12. Clusters of Local Communities Nearby Project Facilities

Among the social receptors, vulnerable groups among PAPs and the Project's workforce are identified and described in **Table 33**, together with vulnerability analysis. The impact on migrant workers in the Project's workforce will be exclusively assessed in **Section 5.6.2.4** due to the potential risk of human rights violations with the Project's contractors and the supply chain. For other vulnerable groups among the fishermen, the associated impact of economic displacement will be addressed and mitigated by compensations and livelihood restoration programs (please see **Section 5.4.2**).

Table 33. Vulnerable Groups within the Aol

Vulnerable groups	Vulnerability Analysis
Fishermen households with female heads	<ul style="list-style-type: none"> • Around 11% of the PAP are female-headed households. Traditionally women are more likely to be the main carers within households and yet, compared to men, are more prone to economic instability. • According to the Project's FLRP, there is no data showing that female PAPs are economically marginalized. Female PAPs, as long as they are either vessel owners or crew members registered with the TFA, they are entitled to compensation and livelihood restoration programs.
Fishermen household with heads aged 60 and above	<ul style="list-style-type: none"> • Around 1/3 of the PAP are aged over 60 years old. Senior people may be more prone to economic disruptions as they usually have fewer alternative employment opportunities. • In this project, elderly PAPs, who are either vessel owners or crew members registered with the TFA, are entitled to compensation and livelihood restoration programs.
Migrant workers among fishermen	<ul style="list-style-type: none"> • Foreign crew members are recorded among affected fishermen. According to the baseline analysis, foreign crew members tend to have full-time and long-term contracts yielding higher yearly salaries, when compared with local crew members.

Vulnerable groups	Vulnerability Analysis
	<ul style="list-style-type: none"> According to the Project's FLRP, migrant workers registered in Taichung City are entitled to compensation and livelihood restoration programs.
Migrant workers among Project's workforce	<ul style="list-style-type: none"> Migrant workers may be hired among the Project's workforces. The main vulnerability lies in the violation of human rights in employment conditions and working conditions. Impact on migrant workers will be assessed in Section 5.6.2.4.
Fishermen households with heads reporting to have disability	<ul style="list-style-type: none"> 5.3% of household heads (vessel owners) respondents have disability cards. Disabled people may take longer time to adjust to economic disruptions. According to the Project's FLRP, the PAPs with disability, as long as they are either vessel owners or crew members registered with the TFA, are entitled to compensation and livelihood restoration programs.
Fishermen households with heads with identify of indigenous people	<ul style="list-style-type: none"> Among the PAP, 2.3% of household head (or vessel owner) respondents were recorded as having an indigenous identity. The Project is not located in the traditional territory or reserved lands of indigenous people. According to the Project's FLRP, indigenous people-headed households' right to compensation and livelihood revitalizations ought to be indifferent to their counterparts, as long as they are either vessel owners or crew members registered with the TFA.

5.2 Types of Social Impacts

The types of social impact included in the assessment process are shown in [Table 34](#) below. The assessment results are exhibited in the following sections.

Table 34. Types of Social Impact

Types of Social Impact	Description of Impact
Impact on Community Health and Safety	<ul style="list-style-type: none"> Dust and particulates emissions may have negative effect on the public health. Noise and vibration may have negative effect on the public health. Communities may be exposed to diseases. Hazardous materials and waste may have negative impact on the public health. Electromagnetic impact may cause health issues. Traffic safety can be jeopardized by poor traffic management. Misconduct of security personnels can have negative impact on communities. Emergency events may have impact on the adjacent communities.
Social-Economic Impact	<ul style="list-style-type: none"> The Project may increase the level of employment. Fisheries livelihood will be disrupted by the Project. Certain ecosystem services may benefit from the Project. Cultural heritage, onshore and underwater, may be affected by the Project. Offshore vessel collision with project facilities may cause injuries and business loss. Visual landscape quality may be damaged by wind turbine structures.
Impact on Infrastructure and Services	<p>Project activities may affect the quality and supply of the following infrastructure services:</p> <ul style="list-style-type: none"> Transportation and road service Health service Waste treatment and disposal service
Impact on Labor and Working Condition	<p>This concerns the impact on the Project labor force, including:</p> <ul style="list-style-type: none"> Forced labor or child labor Working condition of labor force Occupational health and Safety

5.3 Impact on Community Health and Safety

5.3.1 Dust and Particulates Emissions

Dust and particulates resulting from onshore and offshore construction activities can cause human impact, such as respiratory symptom, aggravated asthma, nonfatal heart attack, etc. Based on the characteristic of the Project, an offshore wind farm, there will be no air pollutants, such as carbon dioxide (CO₂), nitrogen oxide (NO_x), sulfur oxide (SO_x), or particulate matters (PM), emitted during operation stage. The main impact of the Project comes from the construction / decommissioning phase, while the air pollution generated during offshore construction has little impact on onshore receptors. Air quality emissions from construction plant, vehicles and materials, including activities related to the construction of the landfall section, has the potential to impact human health. The assessment made here is for the impact on nearby communities, while the impact on labors will be addressed in Section 5.6.4.

5.3.1.1 Result of Assessment

The construction / decommissioning activities of the Project, including onshore construction, Heavy Goods Vehicles (HGV) movements and exhaust emissions from offshore construction vessels, have a potential to impact local communities on air quality and human health. The impacts from respective activity of the Project are detailed below.

- **Onshore construction**

The construction works include substation constructions and transmission line constructions. Among the construction works, the emission from earthworks is expected to be the highest because more construction machines are engaged, with the highest total TSP of 45.3 g/hr from a single excavator. The expected emissions for substation constructions and transmission line constructions, considering the combined effect of dust emissions from evacuated lands and exhaust emissions from construction machines, are 4.25×10^{-5} g/m²/s and 1.6×10^{-4} g/m²/s, respectively.

The sensitive receptors nearby the Project's facilities are illustrated in **Figure 13** and they include one school (Ching Chyan Junior High School), one tourism site (Gao Mei Wetland) and one residential area in which there is one hospital (Ching Bin Hospital) and one school (Shanshuei primary and junior high school). The Project's onshore cables are located approximately 0.3 km from the nearest sensitive receptors (Ching Chyan Junior High School), with the shortest distance of 1.2 km from the Residential District and 1.5 km from the Gao Mei Wetland. However, as indicated in the Project's EIA, the sensitive zone with the highest impact of dust and particulate is located within the construction sites. Assuming that both the substation construction and transmission line construction would be conducted at the same time, the simulation models in the Project's EIA indicated that the air quality aligned with the regulatory standard in all scenarios and after considering the cumulative impacts of the nearby OWF projects. The impact of onshore construction on local communities is assessed to be low.



- **Onshore HGV movements**

Part of the backfill soil generated by earthworks will be transported to recycling sites by trucks with a frequency of sixteen (16) one-way trips per hour. The air pollutants, especially particulate matters, caused by the earthwork transportations may have negative impact on the health of nearby communities.

The simulation results in the Project's EIA, assuming eight (8) hours transportation per day, showed that the air quality aligned with the regulatory standard in all scenarios. When mitigation measures were applied, such as tires cleaning, watering, the impact would be lower.

- **Offshore construction vessels**

A maximum of twenty-four (24) offshore construction vessels will be operating in a single day for the Project, consuming up to 159 tons of fuels, with the highest TSP of 0.1167 g/s from a single offshore substation installation vessel. The highest concentration of exhaust emissions from vessels mainly occurs around the site but may spread to the onshore communities.

Under the simulation models with the maximum number of vessels operating at the same time, the air quality aligned with the regulatory standard in all scenarios. After considering the cumulative impacts of the nearby OWF projects, the air quality also aligned with the standard.

Overall, as the dust simulations undertaken in the Project's EIA showed the air quality within the AoI aligned with the regulatory standard in all scenarios and after considering the cumulative impacts of the nearby OWF projects. Health impact to the local communities is anticipated to be insignificant and can be mitigated.

It is recommended to monitor the air pollutants, including total suspended particulates (TSP), regularly to track the impact and identify relative issues early as the Project moves on. It is important to note that the cumulative impacts will need to be reviewed and updated appropriately as more information is made available on construction timeframes for other OWF projects.

5.3.1.2 Significance of the Impact

The dust generating activities will occur daily during construction / decommissioning phase, with sixteen (16) one-way trips of HGV per hour. The geographic scope of impact is expected to be limited to the household level. As the simulation results in the Project's EIA showed that the air quality aligned with the regulatory standard in all scenarios, no substantial effects are anticipated. Given the minor magnitude and low likelihood, the significance of the impact of dust and particulates emissions is assessed to be **low**. A summary of the impact assessment is captured in **Table 35**.

Table 35. Social Impact Significance Matrix of Dust and Particulates Emissions

Impact	Dust and Particulates Emissions				
	Household (1)	District (2)	City (3)	Region (4)	
Geographics Extent	The scope of both onshore and offshore components may have implications that are observable at the household level.				
	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)	
Scale of Intensity	Based on the simulation results in the Project's EIA, the air quality can align with the regulatory standard in all scenarios. No substantial effects are anticipated.				
	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)	
Duration	The impact will be limited to the construction / decommissioning phase.				
	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)	
Magnitude	Based on the assessments from the previous three categories, the magnitude of impact is classified as minor.				
	Low	Medium	High	Definite	
Likelihood	The sensitive zone with the highest impact is located within the construction sites, and the Project is located approximately 0.5 km from the nearest sensitive receptors, with the shortest distance of 1.2 km from the Residential District, making the low likelihood of evident impacts.				
	Extremely Low	Low	Medium	High	Extremely High
Significance	Given the minor magnitude and the low likelihood of occurrence, the significance of this impact is assessed as low.				

5.3.1.3 Mitigation Measures

The mitigation measures to manage air quality impacts are summarized in **Table 36**, which are indicated in the Community Health, Safety and Security Plan (CHSSP) and the Environmental Management Plan (EMP). In addition, as stated in the Stakeholder Engagement Plan (SEP), proactive engagement and grievance mechanism will be made accessible by stakeholders and they help to identify any potential related issues early and to achieve an appropriate solution.

Table 36. Mitigation Measures of Dust and Particulates Emissions

Category	Mitigation Measure
Construction activities	<ul style="list-style-type: none"> Restrict or cease dust-generating activities on extremely windy or dry days, and minimize deliveries of dry materials in windy weather. Minimize drop height during loading or unloading. No burning of any materials on site. Appropriate watering will be utilized at each electricity transmission and distribution work at the onshore construction sites, and accumulative dust will be cleared to reduce dust emission. For the roads around the construction site (500 m from the site), maintenance and cleaning will be carried out if construction machinery is used (except rainy days) to prevent dust from spreading.
Stocking area	<ul style="list-style-type: none"> Stockpiles and handling areas will be maintained in a condition that minimizes windblown or traffic generated dust by water sprays. Where possible, stockpiles are to be located away from residential areas. Stockpiles will be retained for the shortest possible time. Spray or cover any vulnerable areas to prevent windblown surface dust. Ensure sand and other aggregates are stored and covered and not allowed to dry out, unless required for a particular process, to ensure that appropriate additional control measures are in place. In covered stockpiles, only remove the cover in small areas during work and not all at once.
Construction machinery and vehicles	<ul style="list-style-type: none"> All construction plant and machinery will be fitted with adequate emission control devices and maintained in good working order to ensure no excessive exhaust emissions. Start-up of vehicles, where practicable, will be undertaken away from areas of sensitivity. Ensure that the vehicles on site travel at speeds that do not generate excessive amounts of dust. Construction machinery and vehicles in sound condition will be selected. Regular and unscheduled maintenance work will be carried out, and maintenance records will be kept. Vehicles will be washed before leaving the construction site. Ensure vehicles entering and leaving construction sites are covered to prevent escape of materials during transport.

Category	Mitigation Measure
	<ul style="list-style-type: none"> Vehicles will be covered with dust proof covers to reduce pollutions from the transportation of earthwork. Densely populated areas will be avoided from the route of construction vehicles. If these areas cannot be avoided, the driving standards will be made stricter. When passing through densely populated areas, speed will be reduced to avoid dust emission. Ensure fuels consumed by construction machinery meet the regulatory standards. Construction vehicles will consume diesel (including biodiesel) with a Sulphur content lower than 10 ppmw. Ensure construction vehicles (such as diesel car) align with the emission standard of diesel 5 or higher standards and construction machinery (such as excavators, tractors) align with the emission standard of diesel 3 or higher standards. Otherwise, filters will be installed. Regular exhaust inspections will be conducted to ensure compliance with the Standards of Air Pollutant Emission from Mobile Pollution Source(移動污染源空氣污染物排放標準). High grade diesel with low air pollutant emissions is preferred where applicable. At least 1/5 of construction machinery and 4/5 of earthwork vehicles will be equipped with self-management labels. Concrete or asphalt will be applied to pave the main routes used by construction vehicles within the construction site of onshore substation.
Vessels	<ul style="list-style-type: none"> Vessel emissions will comply with the ozone depleting substances regulations in International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI. Where relevant, vessels will have a valid International Air Pollution Prevention (IAPP) certificate. Vessels will consume fuel with a Sulfur content lower than 0.5%.
Monitoring	<ul style="list-style-type: none"> During construction, CCTVs will be set up for the construction site and emergency response measures will be applied as required by the Air Pollution Control Act (空氣污染防治法). A 24-hour continuous monitoring on air pollutants will be conducted per season during construction and records will be kept.

5.3.1.4 Significance of residual impact

The mitigation measures are anticipated to be effective for decreasing the magnitude of impact to “negligible”. The significance of residual impact is extremely low.

5.3.2 Noise and Vibration

Noise and vibration caused by construction activities of the Project can have varying degrees of impact on nearby communities, ranging from cracks in buildings to health issues such as sleep disturbance, poor concentration and mental health impacts. In addition, wind turbines in operation may also cause noise and vibration, leading to health impact on local communities. It is important to note that the assessment made here is for the impact on nearby communities, while the impact on labors will be addressed in [Section 5.7.3](#).

5.3.2.1 Result of Assessment

The Project may cause noise and vibration during its lifecycle, including construction, operation and decommissioning phases, leading to health impact on local communities. For the construction and decommissioning phases, the main sources of noise and vibration come from construction activities, including blasting and piling, and HGV movements. For operation phase, the wind turbines produce continuous frequency (20 Hz to 20 Hz) and low frequency (25 Hz to 200 Hz) noises through mechanical and aerodynamic mechanisms. The sensitive receptors are illustrated in [Figure 13](#), showing that the Project is located approximately 0.5 km from the nearest sensitive receptors, with the shortest distance of 1.2 km from the Residential District. However, as the simulation results of noise and vibration undertaken in the Project's EIA showed, the sensitive zone with the highest impact is located within the construction site. The impacts on local communities were deemed to be minor or negligible based on the simulation. Please refer to [Table 37](#) for more details.

The noise and vibration level are recommended to be regularly monitored to identify impacts early. Please note that the cumulative impacts will need to be reviewed and updated appropriately as more information is made available on construction timeframes for other OWF projects.

Table 37. Impact Assessment of Noise and Vibration

Impact Source	Impact Assessment of Noise	Impact Assessment of Vibration
Onshore construction	The simulations included two (2) models, the switchyard construction and the substation construction. Both models assumed that transmission line construction and switchyard / substation construction would be conducted at the same time with all construction machines operating. The simulation results showed that, comparing to the ambient noise level, there were 0 to 1.3 dB(A) noise increases for the nearby receptors, including residents, schools and communities, which was deemed to be negligible and adhere to regulatory noise criteria. After considering the cumulative impact of surrounding OWF projects, the impact was also assessed to be negligible in the simulation.	To assess the ground-born vibration by construction activities, the simulation took into account all construction machinery applied during construction. The result showed that, at a distance of 50 m away from the vibration source, the vibration level was simulated to be 58.4 dB(A), which is physically perceptible but have no impact on sleep.
HGV movements	During the construction, HGV / trucks will travel through Provincial Highway 17 for earthwork transportation, with a predicted frequency of sixteen (16) one-way trips per hour. The simulation results showed that the noise level around the receptors increased only 0 to 0.3 dB(A), which was deemed to be negligible and adhere to regulatory noise criteria.	The simulations were based on the areas of sensitive receptors, including schools and local communities. The simulation results showed that the vibration levels ranged from 32 dB(A) to 59 dB(A). Vibration levels below 55 dB(A) are imperceptible, while levels between 55-65 dB(A) are physically perceptible but have no impact on sleep.
Operation	The sources of noise generation from operating wind turbines can be divided into two categories, mechanical sounds, from the interaction of turbine components, and aerodynamic sounds, produced by the flow of air over the blades. The simulation models with the maximum number of turbines and a wind speed of 14 m/s showed that both the continuous frequency (20 Hz to 20 kHz) and low frequency (20 Hz to 200 Hz) noise had negligible impact on nearby receptors and aligned with the noise control standards issued by the Ministry of Environment (MOENV). After considering the cumulative impact of surrounding projects, the impact was also assessed to be negligible in the simulation.	There is no vibration expected during operation.

5.3.2.2 Significance of the Impact

The noise and vibration generating activities will occur throughout the Project's lifecycle, including construction, operation and decommissioning phases, with the geographic scope of impact expected to be limited to the nearby households. As the simulation results in the Project's EIA showed that both the noise and vibration had negligible impact on nearby receptors and no substantial effects are anticipated. Given the minor magnitude and low likelihood, the significance of the impact of noise emissions is assessed to be **low**. A summary of the impact assessment is captured in **Table 38**.

Table 38. Social Impact Significance Matrix of Noise Emission

Impact	Noise and Vibration			
Geographics Extent	Household (1)	District (2)	City (3)	Region (4)
	Both onshore and offshore components may have impacts on the nearby households.			
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)
	Based on the simulation results in the Project's EIA, both the continuous frequency and low frequency noise had negligible impact on nearby receptors and aligned with the noise control standards. No substantial effects are anticipated.			
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)

The impact will occur throughout the Project's lifecycle, including construction, operation and decommissioning phases.					
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)	
	Based on the assessments from the previous three categories, the magnitude of impact is classified as minor.				
Likelihood	Low	Medium	High	Definite	
	The sensitive zone with the highest impact is located within the construction site, and Project is located approximately 0.5 km from the nearest sensitive receptors, with the shortest distance of 1.2 km from the Residential District, making the low likelihood of evident impacts.				
Significance	Extremely Low	Low	Medium	High	Extremely High
	Given the minor magnitude and the low likelihood of occurrence, the significance of this impact is assessed as low.				

5.3.2.3 Mitigation Measures

The mitigation measures to manage noise and vibration impacts listed in the Project's EIA are summarized below. An EMP is developed through the Project's EIA to manage the potential risks identified. In addition, the SEP also provides mitigation measures to manage impacts, e.g., the proactive engagement and grievance mechanism accessible by stakeholders help to identify any potential related issues early and to achieve an appropriate solution.

- Properly plan construction time to prevent loud noise and strong vibration at night or early in the morning and enhance construction management.
- Incorporate the noise control standards into the construction specifications, and adopt construction management measures, replace construction machinery vehicles, or further adopt other noise reduction measures based on the noise monitoring results.
- Low-noise construction machinery and vehicles will be adopted on onshore construction sites and be regularly maintained to ensure their good condition and normal operation.
- The driving speed and transport load of construction vehicles will be restricted. Rapid acceleration, deceleration and horn honking will be prohibited when construction vehicles travel through sensitive receptors such as schools or communities. Concrete mixer trucks will reduce operating speed when waiting in the construction site to reduce the noise and vibration level.
- When loading earthworks from the excavator to the truck, the truck will be parked close to the excavator to reduce unnecessary noise from the excavator moving back and forth.
- For directional mechanical noise, adjust the direction to move the noise and vibration source away from the sensitive receptor.
- Conduct a 24-hour continuous monitoring on ambient noise and vibration per season during construction and operation and conduct a monitoring on construction noise per month during construction.

5.3.2.4 Significance of residual impact

The mitigation measures are anticipated to be efficient for decreasing the magnitude of impact to "negligible". The significance of residual impact is extremely low.

5.3.3 Exposure to Diseases

According to IFC PS 4, the potential for community exposure to water-borne, water-based, water-related, and vector-borne diseases, and communicable diseases that could result from project activities should be avoided or minimized, taking into consideration differentiated exposure to and higher sensitivity of vulnerable groups. During construction and decommissioning phases, The Project's activities may generate communities' exposure to waterborne, vector-borne or communicable diseases.

5.3.3.1 Result of Assessment

For waterborne or vector-borne diseases, it is often earthworks, such as trenching and watering for dust suppression, that lead to the creation of vector habitats. As the earthworks undertaken during construction is expected to be limited, the creation of vector habitat is not expected to be a significant risk. However, sanitary waste generated during construction can cause problems such as flying, contaminating the ground, and emitting odor, etc.

For communicable diseases, there is a potential for spread of communicable diseases such as HIV/AIDS, tuberculosis, Covid-19, into the local community from infected workers who have worked in different places. It is estimated there will be at most one hundred (100) on-site workers at the same time during construction. According to the Project's EIA, some workers may come from the Project Aol. If the 100 workers are all sourced from outside the Aol and accommodated in Qingshui District, where the onshore substation will be located, it represents 0.11% of the total population of the district. The workforce will decrease substantially to about twenty (20) personnels during the operation phase. To monitor the impact, it is recommended to take measures to control the spread of diseases and records of health check-up and other control measures should be kept.

5.3.3.2 Significance of the Impact

The Project's key activity that may increase potential for community's exposure to diseases mainly occur during construction phase, with the geographic scope of impact expected to be limited to district level. The number of workers compared to the population of the district is small. While it may noticeably affect the health of the community, the likelihood of a breakout of a disease is low given that we are operating in first world countries with access to extremely high standards of hygiene and healthcare. Given the moderate magnitude and low likelihood, the significance of the impact is assessed to be **low**. A summary of the impact assessment is captured in **Table 39**.

Table 39. Social Impact Significance Matrix of Exposure to Diseases

Impact	Exposure to Diseases			
	Household (1)	District (2)	City (3)	Region (4)
Geographics Extent	Direct and measurable impacts will be at district level.			
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)
	The outcome of exposure to diseases may noticeably affect the health of the community, e.g. serious illness.			
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)
	The impact is expected to occur mainly during the construction phase.			
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)
	Based on the assessments from the previous three categories, the magnitude of impact is classified as moderate.			
Likelihood	Low	Medium	High	Definite
	Given the small number of workers compared to the population of the district, the likelihood is marked as low.			
Significance	Extremely Low	Low	Medium	High
	Given the moderate magnitude and the low likelihood of occurrence, the significance of this impact is assessed as low.			

5.3.3.3 Mitigation Measures

If an infectious disease occurs, contractors will promptly report it to the project management team. Workers who exhibit symptoms of illness or have had significant exposure will be isolated and monitored. Based on the nature of the issue, a management plan will be developed outlining the necessary next steps, monitoring and communication requirements, and any medical needs. Lessons learned during the Coronavirus outbreak will guide the implementation of strategies on the Project moving forward.

Some mitigation measures in the CHSSP, are also helpful to manage disease exposure impacts, including:

- Housekeeping and waste management will be part of the Project's Employers Requirements and be included in the topics of the lunch and learn sessions and onsite health, safety and environment (HSE) initiatives to lower the probability of environmental incidents leading to water quality and availability, infestations of insects and rodents and the spread of infectious diseases.
- Sanitary waste generated during construction will be collected in containers with lids. Entrust qualified waste vendors or coordinating the local cleaning team to transport it to the waste treatment or disposal facilities.
- Being able to provide efficient response and ongoing care on the Project reduces the risk to local communities and other stakeholders, as the probability of spread of infectious diseases can be lowered.
- Implement the proactive engagement in the SEP and grievance mechanism accessible by stakeholders to identify any potential related issues early and to achieve an appropriate solution.

5.3.3.4 Significance of residual impact

The mitigation measures are anticipated to efficiently reduce the impact to "minor", even considering potential incidents like COVID-19 in the future. Therefore, the significance of any residual impact is considered low.

5.3.4 Hazardous Materials and Waste

According to IFC PS 4, the potential for community exposure to hazardous materials and substances that may be released by the Project should be avoided or minimized. To avoid impact on human health due to environmental contamination, commercially reasonable efforts should be exercised to control the safety of deliveries of hazardous materials, and of transportation and disposal of hazardous wastes.

5.3.4.1 Result of Assessment

During construction and decommissioning phases, improper disposal of construction waste and mismanagement of hazardous materials can cause environmental contamination, such as soil and water contamination, leading to human health impact on the communities who drink or eat the water, crops and foods sourced near the sites. While the Project does not involve the use of hazardous chemicals in significant amounts, the maintenance of construction machinery and vehicles requires engine oil and lubricants. Wastewater (or oil) generated from construction equipment maintenance has high oil content. It is recommended to conduct regular on-site inspections to identify issues related to environmental contamination.

5.3.4.2 Significance of the Impact

Hazardous materials and waste may exist during construction / decommissioning phase, with the geographic scope of impact expected to be limited to district level. While the frequency of the maintenance of construction machinery and vehicles is low, it may noticeably affect the health of the community. Given the moderate magnitude and low likelihood, the significance of the impact is assessed to be **low**. A summary of the impact assessment is captured in [Table 40](#).

Table 40. Social Impact Significance Matrix of Hazardous Materials and Waste

Impact	Hazardous Materials and Waste			
	Household (1)	District (2)	City (3)	Region (4)
Geographics Extent	Direct and measurable impacts will be at district level.			
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)
	The outcome may noticeably affect the health of the community, e.g. serious illness.			
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)
	The impact is expected to occur mainly during the construction / decommissioning phase.			
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)
	Based on the assessments from the previous three categories, the magnitude of impact is classified as moderate.			
Likelihood	Low	Medium	High	Definite

Given that the Project does not involve the use of hazardous chemicals in significant amounts, the likelihood is marked as low.					
Significance	Extremely Low	Low	Medium	High	Extremely High
	Given the moderate magnitude and the low likelihood of occurrence, the significance of this impact is assessed as low.				

5.3.4.3 Mitigation Measures

As stated in Code of Conduct for Business Partners, the suppliers and contractors are required to consider the environmental impacts of, and put in place procedures to minimize, adverse environmental impacts related to their activities, including in respect of hazardous materials and waste and including during the construction phase, in accordance with good industry practice. As required in the Project's Environmental and Social Management Plan (ESMP), the contractors will submit on request the amounts and types of materials used, waste generated (divided in waste categories) and energy used.

Based on the Project's EIA, EMP, and Waste Management Plan (WMP) of the Project, the mitigation measures to manage impacts of hazardous materials and waste include:

- During construction, wastes such as components, tires, batteries, and solvents will be properly collected. Those cannot be recycled and reused will be disposed in accordance with the relevant regulations to prevent arbitrarily discarding and environmental contamination.
- Any hazardous waste to be disposed of will be managed by licensed waste vendors and managed in accordance with regulatory requirements.
- During the transportation of hazardous materials and waste, overloading will be prohibited, and the transported stuffs will be covered to avoid affecting the environment along the way.
- All offsite waste transportation must be accompanied by a Waste Transfer Manifest (WTN), which states the type and quantity of waste being removed, the waste carrier's information and the intended end destination. The WTN must be signed by both the haulage driver and the contractor to whom the waste belongs.
- The engine oil, lubricants, etc. will be used at designated locations and carefully stored in specified wastewater /oil collection buckets with lids to avoid leakage. The wastewater/oil will be handled by qualified recycling contractors. Any discharge of wastewater/oil is strictly prohibited.
- When waste incidents and spills occur, the contractors will follow the reporting procedures set in the WMP and Employer Requirements.
- Monitoring records in relation with the disposal of foul water, bilge water, ballast water and onshore wastewater during the construction phase will be retained for future reference.
- Implement the proactive engagement in the SEP and grievance mechanism accessible by stakeholders to identify any potential related issues early and to achieve an appropriate solution.

5.3.4.4 Significance of residual impact

Implementing mitigation measures will reduce the impact magnitude to "negligible", resulting in an extremely low significance of residual impact.

5.3.5 Electromagnetic Impact

During operation phase, the onshore substation and transmission lines may create electromagnetic impact exposed to nearby households, which may affect communication equipment or cause health issues.

5.3.5.1 Result of Assessment

Studies showed a link between exposure to Electromagnetic Field (EMF) and increased rate of Leukemia, cancer, brain tumors and other health problems (Ibrahim Duhaini, 2016). Based on the simulation undertaken in the Project's EIA, the public exposure to electromagnetic impact within the Aol (maximum 12.46 mG) was much lower than the reference level (833 mG) suggested by MOENV. The substations and transmission lines cause very limited electromagnetic impact to the local community.

The electromagnetic level is recommended to be regularly monitored to identify impacts early. Please note that the cumulative impacts will need to be reviewed and updated appropriately as more information is made available on construction timeframes for the other OWF projects.

5.3.5.2 Significance of the Impact

Electromagnetic impact that may exist during operation phase, with the geographic scope of impact expected to be limited to households near to the onshore substation and transmission lines. Based on the simulation undertaken in the Project's EIA, the substations and transmission lines cause very limited electromagnetic impact to the local community. Given the minor magnitude and low likelihood, the significance of the impact is assessed to be **low**. A summary of the impact assessment is captured in **Table 41**.

Table 41. Social Impact Significance Matrix of Electromagnetic Impact

Impact	Electromagnetic Impact			
	Household (1)	District (2)	City (3)	Region (4)
Geographics Extent	Direct and measurable impacts will be limited to households near to the onshore substation and transmission lines.			
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)
	Based on the simulation undertaken in the Project's EIA, the substations and transmission lines cause very limited electromagnetic impact to the local community.			
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)
	The impact may exist during the operation phase.			
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)
	Based on the assessments from the previous three categories, the magnitude of impact is classified as minor.			
Likelihood	Low	Medium	High	Definite
	Given the simulated impact (maximum 12.46 mG) was much lower than the reference level (833 mG), the likelihood of impact occurrence is marked low.			
Significance	Extremely Low	Low	Medium	High
	Given the minor magnitude and the low likelihood of occurrence, the significance of this impact is assessed as low.			

5.3.5.3 Mitigation Measures

Even though the impact is estimated to be very limited, the Project will implement the proactive engagement in the SEP and develop grievance mechanism accessible by stakeholders to identify any potential related issues early and to achieve an appropriate solution.

5.3.5.4 Significance of residual impact

Mitigation measures will help identify potential issues, but they may not reduce the significance of the residual impact, which is already considered low.

5.3.6 Onshore Traffic Safety

Traffic congestion due to increased vehicle movements and HGV movements may increase the potential for unsafe conditions, even an accident, to occur, leading to negative impacts on the local communities.

5.3.6.1 Result of Assessment

During construction, it is expected to involve sixteen (16) one-way trips per hour for HGV / trucks transporting the back-filled soils. An estimated 100 one-way trips during peak hours for cars and scooters will occur due to commute of workers. The volume of vehicle movements is expected to decrease substantially during the operation phase, which a total of twenty (20) one-way trips during peak hours for cars and scooters is estimated to occur due to maintenance personnels. Hence, the impact is expected to occur mainly during construction.

The increased cars and scooters movements during peak hours and HGV movements around the sites may increase the potential for unsafe conditions to occur, ranging from near miss to fatal accident, resulting in negative safety impact and mental stress on the local communities. Given the low possibility of the catastrophic traffic incident, such as injury or fatalities, the number of the severely impacted receptors is expected to be limited.

It is recommended to enact a traffic management plan and implement accordingly, while the cumulative impacts will need to be reviewed and updated appropriately as more information is made available on construction timeframes for the other OWF projects.

5.3.6.2 Significance of the Impact

The traffic safety issues will be present mainly during the Project's construction phase. The geographic scope of the impact is expected to be limited to district, encompassing the routes travelled by the vehicles of the Project. While the potential outcome of this impact can be catastrophic, the severely impacted receptors is expected to be limited, leading to moderate effects and the low likelihood of extensive damage. Given the moderate magnitude and low likelihood, the significance of the impact is assessed to be **low**. A summary of the impact assessment is captured in **Table 42**.

Table 42. Social Impact Significance Matrix of Traffic Safety

Impact	Traffic safety				
Geographics Extent	Household (1)	District (2)	City (3)	Region (4)	
	The scope of both onshore and offshore components may have implications that are observable at the district level.				
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)	
	The potential outcome of this impact can be catastrophic, such as injury or fatality, while the severely impacted receptors are expected limited.				
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)	
	The impact will be present mainly during the Project's construction phase.				
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)	
	Based on the assessments from the previous three categories, the magnitude of impact is classified as moderate.				
Likelihood	Low	Medium	High	Definite	
	The likelihood for accident which causes extensive damage is low.				
Significance	Extremely Low	Low	Medium	High	Extremely High
	Given the moderate magnitude and the low likelihood of occurrence, the significance of this impact is assessed as low.				

5.3.6.3 Mitigation Measures

The mitigation measures to manage traffic safety outlined in the Project's EIA and CHSSP are summarized below. In addition, the SEP also provides mitigation measures to manage impacts, e.g., the proactive engagement and grievance mechanism accessible by stakeholders help to identify any potential related issues early and to achieve an appropriate solution.

- A traffic management plan will be developed to implement traffic control measures such as early warning signs, site warning signs and notices, temporary speed limits, partial road closures, traffic cones, no reversing rules and demarcated routes for vehicles and pedestrians. Personnel will be assigned to maintain traffic safety.
- HGVs will be equipped with devices to prevent visual blind spot and to reduce the potential for an accident to arise.
- All personnel will be given awareness training and discuss traffic management for each shift via daily toolbox talks.

5.3.6.4 Significance of residual impact

Implementing the developed mitigation measures may reduce the impact's magnitude may be reduced to a "minor" level, keeping its significance low.

5.3.7 Misconduct of Security Personnel

IFC PS 4 requires that when security personnel are retained, it is necessary to assess risks posed by the security arrangements to those within and outside the project site. The security arrangements should be guided by the principles of proportionality and good international practice in relation to hiring, rules of conduct, training, equipping, and monitoring of such workers, and by applicable law.

5.3.7.1 Result of Assessment

According to the CHSSP, the onshore substation is required to have 24-hour security during construction. No security personnel in the Project will be armed. They will receive training on access and egress arrangements and on treating individuals with dignity. In addition, all contractors have agreed to ESG clauses and Code of Conduct as part of their contracts. Security arrangements will be stationed at strategic locations throughout the wind farm to alert non-authorized vessels.

5.3.7.2 Significance of the Impact

The security personnels will be present during construction phase, with the geographic scope of impact expected to be limited to households nearby the onshore substation. While the likelihood of occurrence is low, the potential outcome of this impact may noticeably affect the community safety. Based on the above assessments, the significance of the impact is assessed to be **low**. A summary of the impact assessment is captured in [Table 43](#).

Table 43. Social Impact Significance Matrix of Misconduct of Security Personnel

Impact	Misconduct of Security Personnel				
Geographics Extent	Household (1)	District (2)	City (3)	Region (4)	
	The scope is expected to be limited to households nearby the onshore substation.				
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)	
	The potential outcome of this impact may noticeably affect the community safety.				
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)	
	The impact will be present during construction phase.				
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)	
	Based on the assessments from the previous three categories, the magnitude of impact is classified as minor.				
Likelihood	Low	Medium	High	Definite	
	The likelihood is assessed to be low.				
Significance	Extremely Low	Low	Medium	High	Extremely High
	Given the minor magnitude and the low likelihood of occurrence, the significance of this impact is assessed as low.				

5.3.7.3 Mitigation Measures

The mitigation measures to manage misconduct of security personnel include:

- As outlined in the CHSSP, security personnel management in relation to hiring, rules of conduct, training, equipping and monitoring will comply with applicable regulations and guidelines.
- As stated in the Code of Conduct for Business Partners, contractors are expected to ensure that all security personnel, including contracted security personnel, respect the human rights and dignity of all people, and in case of threat, use only reasonable force, proportional to the threat.

- Implement the proactive engagement and grievance mechanism accessible by stakeholders to identify any potential related issues early and to achieve an appropriate solution.

5.3.7.4 Significance of residual impact

Since no security personnels will be armed and the developed mitigation measures are implemented, the expected impact magnitude is considered “negligible”, resulting in an extremely low significance of residual impact.

5.3.8 Emergency Events

Man-made or natural disaster-induced emergency events of a project, such as unsafe structural element/components, fire, typhoon, lightning, and earthquake, can cause failure or malfunction of structural elements or components, leading to immediate impact on local communities, ranging from property loss, injuries to emotional stress. According to IFC PS 4, it is necessary to design, construct, operate, and decommission the structural elements or components of the Project in accordance with good international industry practice (GIIP), taking into consideration safety risks to third parties or Affected Communities. The Project should assist and collaborate with the Affected Communities, local government agencies, and other relevant parties, in their preparations to respond effectively to emergency situations.

5.3.8.1 Result of Assessment

Emergency occurrences could be caused by man-made or natural factors. Man-made factors include design or manufacturing defect, poor maintenance regime, exceeding maximum design loads, rotor over-speed, or fire, while natural factors include extreme weather events such as excessive winds during a storm, typhoon, or lightning. Given the huge volume of the Project’s structural elements or components, man-made or natural factors causing failure or malfunction of structural elements or components may threaten the safety of communities. For example, loose blades falling from turbines with an average height of 200 m might strike nearby people and communities. In addition, explosion or fire in substation or turbines due to being struck by lightning can lead to catastrophic damage to communities.

According to the Climate Change Risk Assessment (CCRA), the risk of extreme precipitation events, flood and extreme wind events is considered very significant due to high striking frequency of typhoon and the corresponding damage caused in Taiwan. Besides, since the turbines are located offshore and extremely tall, ranging from 199 to 304 m, the possibility of being struck by lightning is high. On the other hand, due to the location of the wind farm being in Taiwan and the climate experienced, ice is not expected and therefore ice throw from the blades is not a foreseeable risk.

While the risk of typhoon and lightning are apparent, the structural components of the Project are located offshore and far from the sensitive receptors, making a low likelihood of causing extensive damage. It is recommended to establish an Emergency Response Plan (ERP) for the Project’s construction, operation and decommissioning phases.

5.3.8.2 Significance of the Impact

The risk will be present throughout the Project’s lifecycle, including construction, operation, and decommissioning phases. The geographic scope of impact expected to be limited to district and likelihood of occurrence of emergency events is low. While there is high striking frequency of typhoon in Taiwan, the offshore work will be suspended when the risk of typhoon or extreme weather events has been identified, and huge structural components of the Project is located offshore where is far from the sensitive receptors, making a low likelihood of causing extensive damage. Given the moderate magnitude and low likelihood, the significance of the impact is assessed to be **low**. A summary of the impact assessment is captured in **Table 44**.

Table 44. Social Impact Significance Matrix of Emergency Events

Impact	Emergency Events			
	Household (1)	District (2)	City (3)	Region (4)
Geographics Extent	The scope of both onshore and offshore components may have implications that are observable at the district level.			
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)

The potential outcome of this impact can be catastrophic, such as injury or fatality, while the severely impacted receptors is expected limited.				
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)
	The impact will be present throughout the Project's lifecycle, including construction, operation and decommissioning phases.			
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)
	Based on the assessments from the previous three categories, the magnitude of impact is classified as major.			
Likelihood	Low	Medium	High	Definite
	The likelihood for accident or emergency which causes extensive damage is low.			
Significance	Extremely Low	Low	Medium	High
	Given the moderate magnitude and the low likelihood of occurrence, the significance of this impact is assessed as low.			

5.3.8.3 Mitigation Measures

According to the Project's EIA, the structural element/components are equipped with lightning protection and are designed to withstand extreme storms. The wind turbines will be designed based on the national standards and the recommendations of the Joint Industry Project (JIP) to prevent structural damages from earthquakes and typhoons. The design and maintenance plan of the turbines have taken the corrosion effect into consideration to ensure that the turbines can withstand winds within the design speed before decommissioned.

An Emergency Response Plan (ERP) has been established and documents the external parties identified to be part of the emergency response process as well as the communication lines. The FEM1 Community Liaison Officer will manage all stakeholder engagement and relevant information will be provided in a timely manner and updated periodically. The Project will also keep relevant Government agencies, authorities and Regulators up to date and perform in joint drills to enhance collaboration and training. The mitigation measures to manage emergency events outlined in the CHSSP are summarized in [Table 45](#).

Table 45. Mitigation Measures of Emergency Events

Issue	Implementing Phases	Mitigation Measure
Structural Safety	Construction Phase	<ul style="list-style-type: none"> Structural components will be designed and constructed by competent professionals and certified or approved by competent authorities or professionals. The electrical and civil design of the onshore substation and transmission lines will be reviewed and approved by Professional Engineers prior to the start of construction. Contractors are required to comply with the Project's Employers Requirement that the structures must be able to be accessed and maintained safely throughout their life and also with the contents of the Health and Safety Employers Requirements which includes an obligation to work to industry best practice. Quality inspections and surveillance will be conducted during the manufacturing of the turbine components. The load design will ensure no catastrophic failure of the blades during operation. The onshore substation and transmission lines will be subject to risk assessment workshops during the design, construction, and commissioning phases. Prior to the transferring to operational control, the substation will be subject to a further risk assessment together with the operations and maintenance staff.
Emergency preparedness	Construction / Decommissioning Phases	<ul style="list-style-type: none"> When a typhoon event is identified, all machinery and structures in the onshore sites will be fixed with wires and brackets. When works are not being undertaken, all equipment must be cleared away on-board the vessel and structures to prevent fouling and accidents or endangerment of third-party vessels in the surrounding area. Access to the substation and active construction sites will be restricted to competent, trained and authorized personnel only.
	Operation Phase	<ul style="list-style-type: none"> Monitor the wind farm through real-time monitoring systems, including Supervisory Control and Data Acquisition (SCADA) system and Turbine Condition Monitoring (TCM) system. Stop turbines and conduct inspections in the case of irregularities.

Issue	Implementing Phases	Mitigation Measure
		<ul style="list-style-type: none"> Implement periodic inspections on lightning protection system, fire protection systems and escape equipment. Conduct maintenance work according to the requirements of the maintenance manual and schedule to prevent facility failure from increasing the possibility of accidents.
Emergency response	Construction / Decommissioning, Operation Phases	<ul style="list-style-type: none"> The Project will prepare and implement an ERP which details the roles and responsibilities of the emergency response team (ERT), tier levels of incidents and support available, contact details of internal and external help and support including emergency services, government agencies, medical facilities and hotels. Emergency response training will be provided to the ERT on a periodic basis to understand their roles and responsibilities. Contractors are required to ensure emergency response training and drilling onsite and onboard all vessels. In addition to the ERP, further measures are prepared as follow: <ul style="list-style-type: none"> Three (3) tier incident process, ERT and Crisis Management Team to support more serious events. A telephone conference facility dedicated to emergency events. Crisis Management Team boxes located in designated Meeting Rooms, which will be assigned for emergency events, to provide all resources required for serious incidents.

5.3.8.4 Significance of residual impact

With the implementation of the mitigation measures, the impact intensity may be reduced to "minor", resulting in a low significance of residual impact.

5.4 Socio-Economic Impact

5.4.1 Employment

5.4.1.1 Result of Assessment

According to the Project's EIA, it is anticipated that the peak daily labor requirement during the construction phase of the project will be approximately 100 workers. Beyond technical roles, there will be a concerted effort to employ local labor wherever possible. Specifically, for the installation of onshore cables and the construction of the onshore substation, priority will be given to hiring local manpower and subcontractors to participate in these activities.

The primary recipients of the employment impacts from the offshore wind development project are local communities and supply chain industries. These impacts are anticipated to manifest during both the construction and operational phases of the Project.

During the construction phase, particularly for the installation of onshore cables and substations, priority will be given to employing local labor and contractors. This policy is expected to generate direct employment opportunities for residents of the local communities.

In the operational phase, subject to operational conditions and availability, the Project aims to engage local fishing vessels for maintenance activities. This approach not only supports the local fishing industry but also provides additional direct employment opportunities.

Furthermore, the Project is anticipated to yield indirect and typically cumulative employment benefits for industries within the domestic supply chain associated with OWF projects. These benefits extend through various sectors involved in the production, supply, and maintenance of components and services integral to the wind farm infrastructure. This positive impact can be measured using indicators such as local employment records, project-related procurement records, and stakeholder management logs.

5.4.1.2 Significance of the Impact

Through an analysis of the baseline conditions, it is understood that there is capacity within the Project's Aol to take up employment opportunities with the Project. Employment and business opportunities for the receptors in the Project's Aol is a positive impact, providing local economic opportunities.

5.4.1.3 Enhancement Measures

Several additional programs and measures could further enhance the positive impact of the Project on local employment and business opportunities:

- **Local Employment**

The Project and the suppliers will actively participate in Taichung City Government's annual job fair to provide employment opportunities for local residents. This initiative aims to facilitate direct engagement with the local workforce and enhance recruitment from neighboring communities.

- **Local Procurement Opportunities**

Upon establishment of the Neighborhood Support and Development Fund (NSDF), the Project will collaborate with district offices to organize promotional events showcasing local products and tourism opportunities. This measure is designed to stimulate local business development and create additional procurement opportunities within the Project's Aol.

- **Fishermen Training and Development Programs**

Implementing training programs for local fishermen to enhance their skills, making them more competitive for both current and future employment opportunities within the Project and the broader industry. These programs could include international standardized HSE training, marine mammal observer training and other relevant skills.

- **Community Engagement and Feedback Mechanisms**

Setting up regular community engagement sessions to provide updates on project progress and gather feedback from local stakeholders can help ensure that the project remains responsive to community needs and concerns. This engagement can also help in identifying additional opportunities for local involvement and addressing any issues promptly.

- **Partnerships with Local Educational Institutions**

Collaborating with local educational institutions to create specialized programs or courses related to the wind energy sector can build a pipeline of skilled workers. Internships, apprenticeships, and other hands-on learning opportunities could also be established to provide practical experience.

These measures can complement the current plans to enhance the positive impact of the Project, ensuring that it maximizes benefits for the local economy and communities.

5.4.1.4 Significance of residual impact

The Project will foster positive social impacts, including community development and increased local employment, particularly during the peak construction phase.

5.4.2 Fisheries Livelihood

5.4.2.1 Result of Assessment

According to the Project's EIA and the FLRP, fisheries that will be affected by the Project include gillnetting, bottom trawling, longlining and crab potting fishing activities. The primary receptors of this impact are local fishermen, and the effects can be measured by catch quantity and catch value.

Impact of the Project's activities on fisheries livelihood is evident and therefore the Project is required to provide compensation to the fishermen based on statutory compensation standards. In addition, while fishermen are expected to seek alternative fishing areas, their options may be somewhat constrained due to the presence of other OWF projects being developed around the Project area.

• **Construction and decommissioning phases**

According to the Project's EIA, to mitigate potential damages to fishing boats and gear, as well as to ensure the unimpeded progress of the offshore wind farm installation, fishing operations surrounding the project area will be restricted during the construction phase. Furthermore, a safe distance will be maintained to minimize interference with existing fishing activities.

As stated in the FLRP, temporary marine exclusion zones, including a 500-m exclusion buffer for safety purposes, will be established. These zones will limit marine traffic and fisheries access to the worksite. The potential impacts on fisheries, productivity, and fishing-based livelihoods include:

- a. Direct impact: Loss of physical area, disruption of or reduced access to fishing grounds.
- b. Indirect impact: Increased travel time, increased input requirements.

Ultimately, these factors are expected to result in a reduction in revenue for fishermen. The loss of income estimated in ESR-IA is NT\$ 39,959,000 over a 3-year period, based on the total value of offshore fisheries in Taichung.

• **Operational phase**

It is noted in FLRP that the potential impacts on fisheries livelihoods during the operational phase are generally similar to those during the construction and decommissioning phases. However, the magnitude of these impacts may vary depending on the fishing methods employed.

The operational lifespan of the Project is expected to be 20 to 25 years. During this period, trawling activities will be prohibited within the wind farm area and along the export cable route. However, all other identified fishing methods will be permitted in the windfarm and export cables corridor area for vessels weighing under 30 tones, with the exception of the 100-m radial exclusion zone directly surrounding each wind turbine structure. Based on the description of the Taichung fishing fleet, it is predicted that these restrictions will exclude 46 out of the 880 vessels operating in Taichung City from accessing the wind farm area and cable route during this phase. The estimated loss of income, as indicated in the ESR-IA, is NT\$ 2,164,000 over a 25-year period.

The indirect impact is expected to be more significant during the operational phase rather than the construction and decommissioning phases, due to the longer timeframes involved.

5.4.2.2 Significance of the Impact

During the construction and decommissioning phases, the affected groups include all existing fishing activities over the period of 3 to 5 years. During the operational phase, the primary impact affects trawler and gill net fisheries for a duration of 25 years. After comprehensive consideration of both the scale and duration of these impacts, the significance assessment across the different periods indicates a **high** level of impact. A summary of the impact assessment is presented in **Table 46** and **Table 47**.

Table 46. Social Impact Significance Matrix of Fisheries Livelihood in Construction and Decommissioning Phases

Impact	Fisheries Livelihood			
	Household (1)	District (2)	City (3)	Region (4)
Geographics Extent	Fishermen located within the coastal townships in Taichung city will be directly impacted by the Project.			
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)
	Temporary disruptions to access fishing grounds and increased vessel traffic may resulting in higher costs and decreased catches.			
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)
	This impact to fisheries livelihood is anticipated to occur throughout the construction phase.			
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)
	Based on the assessments from the previous three categories, the magnitude of impact is classified as moderate.			
Likelihood	Low	Medium	High	Definite

Impact	Fisheries Livelihood				
	The impact is expected to occur throughout the construction phase and is definite to affect most fishing methods.				
Significance	Extremely Low	Low	Medium	High	Extremely High
	Given the moderate magnitude and the definite likelihood of occurrence, the significance of this impact is assessed as high.				

Table 47. Social Impact Significance Matrix of Fisheries Livelihood in Operational phase

Impact	Fisheries Livelihood			
	Household (1)	District (2)	City (3)	Region (4)
Geographics Extent	Fishermen located within the coastal townships in Taichung city will be directly impacted by the Project.			
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)
	Impact on trawler and gill net fisheries, the area is relatively small.			
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (Operational phase)	Permanent (4)
	This impact to fisheries livelihood is anticipated to occur throughout the operational phase.			
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)
	Based on the assessments from the previous three categories, the magnitude of impact is classified as moderate. The difference or change from the baseline conditions is evident. The impact is experienced by the receptors over a long period of time.			
Likelihood	Low	Medium	High	Definite
	The impact is expected to occur throughout the operational phase and is definite to affect trawler and gill net fisheries.			
Significance	Extremely Low	Low	Medium	High
	Given the moderate magnitude and the definite likelihood of occurrence, the significance of this impact is assessed as high.			

5.4.2.3 Mitigation Measures

According to the Project's EIA, whether fishing activities and the passage of fishing vessels will be permitted within the wind farm area in the future will be determined through the development of relevant regulations by the Ministry of Economic Affairs' Bureau of Energy, the Fisheries Agency and other agencies. The wind farm will comply with the applicable regulations.

In accordance with local regulatory requirements, the FLRP incorporates provisions for compensation. And proposes measure various livelihood restoration initiatives as follow.

- **Government Compensation and Funds**

Compensation for direct impact is calculated based on the regulation and are under discussion between TFA and the Project team. Information regarding compensation and funds is presented in **Table 48**.

Table 48. Compensation and Funds for the Project

Compensation and Funds	Payment time	Calculation base and factors	Receptor and Contribution	Anticipated amount
Fishers Compensation	<ul style="list-style-type: none"> Initial payment on signing of the compensation agreement Second Payment prior to the beginning of construction 	<ul style="list-style-type: none"> Compensation formula outlined in the regulation Negotiation and agreement with TFA 	TFA	Under discussion by the Project team and professor Ou from National Taiwan Ocean University

Compensation and Funds	Payment time	Calculation base and factors	Receptor and Contribution	Anticipated amount
Electrical Assistance Fund	Annually in the operational phase (expected in 2027)	Full-power hours per year capacity factor	<ul style="list-style-type: none"> • Taichung City Government: 10.5% • Local township office: 21% • TFA: 38.5% • specific projects supporting stakeholders and local development: 30% 	Total yearly contribution: NT\$ 42.84 million
Co-Thrive Funds	<ul style="list-style-type: none"> • Initial payment (70%) prior to the CP • Second Payment (30%) prior to the EP 	capacity of the wind farm installation, calculated at NT\$ 200,000 per MW of capacity	TFA	NT\$ 10,000,000

Source: Fishery Livelihood Restoration Plan (draft comments file) by NIRAS, 20 September 2024.

• **Compensation alternatives: Fishery Revitalization Initiatives (FRI)**

Besides the statutory compensation, the FLRP proposes revitalization measures to assist local fisheries and presented in **Table 49**. These initiatives include training programs, vessel service contracts, and other relevant activities as determined suitable by the TFA. The implementation of these initiatives will require further discussions and negotiations with stakeholders, as well as an assessment of feasibility and associated costs.

Table 49. Recommendations of Fishery Revitalization Initiatives

Initiative	Description
Initiative 1: Guard vessel contracting opportunities	The goal of this initiative is to indirectly compensate fishermen by providing potential opportunities to support project construction. In this initiative, the guard vessel supplier is obliged to collaborate with TFA and include guard vessels provided by TFA. Priority to be given to Taichung based crew members who not received direct compensation. The initiative also supports retraining of fishermen by providing direct experience working in the offshore wind industry.
Initiative 2: HSE and marine training services	The goal of this initiative is to indirectly compensate fishermen by providing HSE and marine technical training and knowledge transfer to fishermen. The intention is to equip the candidates to pursue opportunities to work in the offshore wind industry or other marine industries.
Initiative 3: Marine net-gain initiatives	<p>Marine net gain refers to an ecological effort to leave the marine environment in a better state following development in a way which creates wider benefits for people and the environment (ABPmer, 2019). Net gain is a mechanism which aims to contribute to the restoration of natural habitats to reverse biodiversity decline. The Areas of the Taiwan Strait have seen a 75 % reduction in the population of coastal fish species over the course of the past three decades, with unsustainable fishing practices cited as the primary cause. (Chen, 2018) Taichung waters may therefore be ideal for marine net gain initiatives. Suggestions for potential net-gain initiatives are provided below:</p> <ul style="list-style-type: none"> • Marine restoration research • Support for more sustainably fishery practices
Initiative 4: Marine tourism	<p>Allow tourism related marine operations in and around the FM1 site during project operation. This could include but is not limited to 1) capacity building for PAPs to engage in tourism fishery, including recreational fishery and/or marine mammal sighting activities within or around the wind farm area; and 2) collaboration with fishery associations and tourism companies for comprehensive tour packages. For example, fishery tours with windfarm sight-seeing, using pole-line method during specific seasons. While no obvious conflicts of these uses during operation have been identified, further analysis of feasibility and HSE considerations is recommended. Currently, similar tours have been identified in Scotland, England, the US, Denmark, and Belgium. Collaboration with and between fishermen associations, tourism companies and local governments is recommended to ensure PAP participation.</p> <p>The execution strategy involves collaboration with TFA and Taichung City Government (TCG). The Project aims to present the initiative to TFA and TCG by October 2027 and initiate discussions</p>

Initiative	Description
	about the tour package by November 2027. The FM1 wind farm site tour is expected to start by April 2028, funded by the Electrical Assistance Fund (EAF) or Co-Thrive Funds.
Initiative 5: Employment services for fishermen	Support TFA to create networking platforms and provide key resources for fishermen to seek alternative employment; This may include cooperation between TFA and FA. Career service design to be tailored by type of professional experience and by vessel owner and crew member, respectively.

Source: Fishery Livelihood Restoration Plan (draft comments file) by NIRAS, 20 September 2024.

5.4.2.4 Significance of residual impact

The implementation of Fishers' Compensation and the FRI, as outlined in the FLRP, will require additional discussions and negotiations with the PAPs. Additionally, an assessment of feasibility and budgeting will be necessary. Therefore, it is recommended that the residual impact assessment be conducted only after the mitigation measures have been fully confirmed.

5.4.3 Local Tourism

5.4.3.1 Result of Assessment

According to the Project's EIA, the main coastal road network provides access to several tourism and recreational sites along the coastline. While the Project's onshore activities during construction may temporarily affect tourism operators and visitor experiences through construction-related traffic (detailed in 5.5.1 Road Service), there are potential positive impacts on local tourism development during the operational phase:

- **Tourism Opportunities**

The presence of OWF demonstrates potential for creating new tourism attractions, reflecting a growing global interest in integrating wind power facilities with tourism activities. A 2019 report⁶ by the media outlet udn.com highlighted Brighton, a prominent tourist destination in southern England, where tourism operators developed their own "Offshore Wind Turbine Tour." This initiative has become a notable example of how the green energy industry can be integrated with regional revitalization efforts.

In 2023, Taiwan's Ocean Affairs Council (OAC) conducted a questionnaire survey on integrating offshore wind farms with marine tourism⁷. The survey results revealed that over 80% of the 302 respondents supported the opening of offshore wind farms for tourism. Among the various aspects of offshore wind farm tourism, the impact on the marine ecological environment was considered the primary concern, while the visual impact was deemed the least important. Additionally, more than 80% of respondents believed that such integration could promote local revitalization and the development of the tourism industry.

- **Recreational Fisheries**

The OWF structures are expected to enhance recreational fishing opportunities through their artificial reef effects. International empirical studies indicate that the foundations of OWF structures can function as artificial reefs and fish aggregation devices. These structures provide habitat for settlement, shelter, and foraging for various marine species. Moreover, the presence of the wind farm will preclude the operation of bottom trawling fisheries, which are considered unsustainable.

Over time, the wind farm has the potential to enhance both biodiversity and commercial fisheries in adjacent waters. As the OWF structures improve the marine habitat, they may also become favorable locations for recreational fishing. This shift could foster the development of recreational fisheries and contribute to the associated tourism values.

⁶ UDN news, https://udn.com/newmedia/2019/global_energy_transition/United_Kingdom/, October 2019.

⁷ "Discussion on the development of offshore wind farms combined with marine tourism." Ocean Affairs Council, <https://www.oac.gov.tw/ch/home.jsp?id=315&parentpath=0,7,116>, June 2023.

5.4.3.2 Significance of the Impact

Evidence from UK case studies and Taiwan's OAC survey demonstrates viable opportunities for local tourism operators to diversify their businesses through OWF-related activities. This presents a positive impact for receptors within the Project's Aol, creating potential economic opportunities for local communities.

Moreover, the wind farm is expected to generate dual benefits: mitigating unsustainable fishing practices through the exclusion of bottom trawling, while enhancing marine habitat through artificial reef effects. These environmental improvements are anticipated to facilitate the development of recreational fisheries, providing additional economic opportunities within the local area.

5.4.3.3 Enhancement Measures

- **Marine Tourism**

According to the FLRP, Marine Tourism is a compensation alternative. Allow tourism related marine operations in and around the Project site during project operation. This could include but is not limited to 1) capacity building for PAPs to engage in tourism fishery, including recreational fishery and/or marine mammal sighting activities within or around the wind farm area; and 2) collaboration with fishery associations and tourism companies for comprehensive tour packages. For example, fishery tours with windfarm sight-seeing, using pole-line method during specific seasons. While no obvious conflicts of these uses during operation have been identified, further analysis of feasibility and HSE considerations is recommended. Currently, similar tours have been identified in Scotland, England, the US, Denmark, and Belgium. Collaboration with and between fishermen associations, tourism companies and local governments is recommended to ensure PAP participation.

- **Marine net-gain initiatives**

Marine net gain refers to an ecological effort to leave the marine environment in a better state following development in a way which creates wider benefits for people and the environment (ABPmer, 2019). Net gain is a mechanism which aims to contribute to the restoration of natural habitats to reverse biodiversity decline. The Areas of the Taiwan Strait have seen a 75 % reduction in the population of coastal fish species over the course of the past three decades, with unsustainable fishing practices cited as the primary cause. (Chen, 2018) Taichung waters may therefore be ideal for marine net gain initiatives. Suggestions for potential net-gain initiatives are provided below:

- Marine restoration research
- Support for more sustainably fishery practices

5.4.3.4 Significance of residual impact

The enhancement measures are anticipated to boost local tourism; however, the extent of benefits needs further evaluation and will depend on resource mobilization and allocation.

5.4.4 Cultural Heritage

5.4.4.1 Result of Assessment

The Project will encompass a variety of activities, including land clearing and cable trenching during the construction phase, which could potentially disturb cultural heritage resources. Associated construction impacts such as noise and dust emissions may also interfere with cultural practices. Local communities and the general public have been identified as the primary receptors of these impacts, which are anticipated to occur predominantly during the construction phase.

According to the Project's EIA, no known tangible and intangible cultural heritages was found within the Project site. Cultural heritage surveys conducted for the Project included desktop research, field investigations, and analysis. Field investigations were carried out in 2020, 2021, and 2023. These comprehensive surveys have identified that there are no buildings, archaeological sites, or relics of cultural or historical significance within the Project's site. Furthermore, no underwater cultural resources were detected within the Project's Aol. This impact can be measured using indicators such as cultural heritage investigation plan and report, stakeholder management log.

5.4.4.2 Significance of the Impact

A summary of the impact assessment is captured in **Table 50**. Given the current baseline conditions, no onshore or underwater cultural heritage or invisible practices have been identified within the Project's site, the significance of this impact is anticipated to be **low**.

Table 50. Social Impact Significance Matrix of Cultural Heritage

Impact	Cultural Heritage			
	Household (1)	District (2)	City (3)	Region (4)
Geographics Extent	The scope of both onshore and offshore components may have implications that are observable at the district level.			
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)
	Based on the current baseline conditions, negligible changes are anticipated.			
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)
	Given the current baseline conditions with no known cultural heritage sites identified within or near the Project area, a low impact rating is anticipated.			
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)
	Based on the assessments from the previous three categories, the magnitude of impact is classified as minor. There is a perceptible difference or change from the baseline conditions.			
Likelihood	Low	Medium	High	Definite
	Given the current baseline conditions, the likelihood of occurrence is low.			
Significance	Extremely Low	Low	Medium	High
	Given the minor magnitude and the low likelihood of occurrence, the significance of this impact is assessed as low.			

5.4.4.3 Mitigation Measures

In accordance with IFC PS8, the Project is required to implement a chance find procedure for managing any cultural heritage discovered during Project activities. Under this procedure, if cultural heritage is discovered, all work in the vicinity will be suspended until a competent professional can conduct an assessment and determine appropriate actions in compliance with PS8 requirements. The Project's chance find procedure, as documented in the EIA, has been developed primarily in alignment with local regulatory requirements.

For onshore cultural heritage, if cultural relics are discovered during construction, they will be managed in accordance with Articles 33, 57, 77, and 88 of the Cultural Heritage Preservation Act. Specifically, any discoveries must be reported to the competent authority, and construction must be suspended until the review procedure is complete.

For underwater cultural heritage, the Project will comply with the Underwater Cultural Heritage Preservation Act (UCHPA) and the Regulations for Investigation and Handling of Underwater Cultural Heritage Prior to Water Area Development and Utilization. An investigation plan will be prepared and submitted for review. If suspected underwater cultural heritage sites are found and cannot be confirmed, the turbine installation locations will be adjusted to avoid these sites. According to Article 13 of the UCHPA, if any suspected underwater cultural heritage sites are discovered, activities affecting these sites must be halted, these sites must be preserved, and the authority must be notified immediately.

In addition to the chance find procedures, the Project also has a SEP and grievance mechanism to address cultural heritage impacts. Stakeholders can use an online feedback form on the Project's website to raise concerns, allowing for quick identification and resolution of issues related to cultural heritage.

5.4.4.4 Significance of residual impact

Following the developed procedures and a chance find procedure, the significance of residual impact remains low.

5.4.5 Offshore Vessel Collision

5.4.5.1 Result of Assessment

According to EIA, the Project areas intersect with existing sea lanes used by commercial vessels navigating the Taiwan Strait. Approximately 1,950 ships pass through this area annually, including cargo ships, oil tankers, and passenger ferries. Of these, 1 % are passenger ferries operating on the Taichung-Wuqi route. The risk of collision poses potential impacts on passengers and shipping businesses during the lifecycle of the Project. As a result, commercial vessels will need to adjust their routes to avoid the project area.

- **The results of independent simulation**

According to the AIS ship dynamic data from August to November 2020 and the north-south channel planning established by the Maritime Port Bureau, Ministry of Transportation and Communication (MOTCMPB), the risk of a collision occurring due to navigational errors in the wind farm area is approximately 3.88×10^{-2} times per year, equivalent to an event interval of approximately 25.78 years.

Given the temporal scope outlined in the Scoping Report, the Project's construction phase is expected to last approximately 3 years, while the operational phase is anticipated to span around 20 to 30 years. From the perspective of the Project's entire lifecycle, the risk of ship collisions does indeed exist.

- **Incorporate simulation with adjacent wind farm**

The risk of collision is heightened when considering the impact of adjacent OWF projects, indicating a cumulative effect. The Project's EIA assumes that if the Jianeng Wind Farm⁸ would be developed and operational in the future, ship routes will inevitably need to be adjusted westward to avoid the wind farm. In summary, the areas with the highest risk of collision with the structures of the wind farm remain on the eastern side of the Project site. If other wind farms are designated near the Project site in the future, this impact will need to be re-simulated and reassessed due to cumulative impact considerations.

5.4.5.2 Significance of the Impact

There is a potential risk of collision during both the construction and operational phases, which will only be eliminated after the decommissioning of the wind power facilities. The impact of this risk is influenced by various factors, including the type and size of vessels, sailing speed, wind power facility structures, and sea and weather conditions. In the event of a collision, the affected areas may include the colliding vessel, passengers and cargo on board, as well as the impacted wind turbine structure. The severity of the collision can range from minor scrapes to the most serious scenarios such as vessel capsizing or even damage to the wind turbines. The consequences may include economic losses, environmental pollution, and threats to personal safety.

However, considering the simulation results from the Project's EIA, the probability of occurrence during the Project's lifecycle is low. Therefore, the overall significance of this impact is anticipated to be **low**.

Table 51. Social Impact Significance Matrix of Offshore Vessel Collision

Impact	Offshore Vessel Collision			
Geographics Extent	Household (1)	District (2)	City (3)	Region (4)
	The impact may affect the passengers, cargos, and the structure of WTG.			
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)
	The intensity of the impact will depend on the extent of the ship collision and various factors. Therefore, high scale of intensity is adopted for pessimistic scenarios.			
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)
	The risk of collision exists throughout the project lifecycle, including the decommissioning phase.			
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)

⁸ According to the EIA for the Jianeng Wind Farm Project, dated February 2022, the Jianeng Wind Farm is located to the west-southwest of the FM1 Wind Farm. However, Northland Power Inc. (NPI) relinquished its contractual rights in June 2023.

Impact		Offshore Vessel Collision			
		Based on the assessments from the previous three categories, the magnitude of impact is classified as moderate.			
Likelihood		Low	Medium	High	Definite
	According to the results of simulation in EIA, the risk of collision equivalent to an event interval of approximately 25.78 years.				
Significance		Extremely Low	Low	Medium	High
				High	Extremely High
		Given the moderate magnitude and the most likely likelihood of occurrence, the significance of this impact is assessed as high.			

5.4.5.3 Mitigation Measures

Although the impact significance is low, the Project's EIA has still proposed mitigation measures. The Project is required to set up navigation marks and route marking in accordance with regulatory recommendation and is recommended to consider adding extra navigation beacons around the Project area to enhance the level of safety. An exclusion zone will be established to reduce the risk of collision of project vessels with commercial vessels.

During the planning stage prior to construction, information will be provided to mapping units as early as possible, in accordance with the wind farm development progress. This is to ensure timely and comprehensive charting on nautical charts (electronic navigational charts), thereby enhancing navigational safety.

Throughout the construction and operational periods, for vessels drifting without power, the operational management unit will establish a mutual rapid reporting mechanism with coast guard, port authority, and disaster prevention organizations. This enables timely reporting when incidents occur, reducing the likelihood of collision accidents and mitigating disaster losses.

On the other hand, for powered vessels, the Project will install warning facilities such as lighting in accordance with Taiwan's "Technical Specifications for the Installation of Aids to Navigation" during the construction phase. This will reduce the risk of powered vessels inadvertently entering the wind farm area. The management and maintenance unit will conduct regular inspections and updates of the facilities to ensure the reliability of the warning systems.

The implementation of the mitigation measures can be monitored using relevant indicators, including annual records of accident reporting drills and regular equipment inspection records.

5.4.5.4 Significance of residual impact

After implementing the mitigation measures, the intensity can be reduced to "no substantial effects" and a shorter duration of impact, resulting in a minor magnitude of impact. Therefore, the significance of the residual impact remains low.

5.4.6 Visual Landscape Quality

5.4.6.1 Result of Assessment

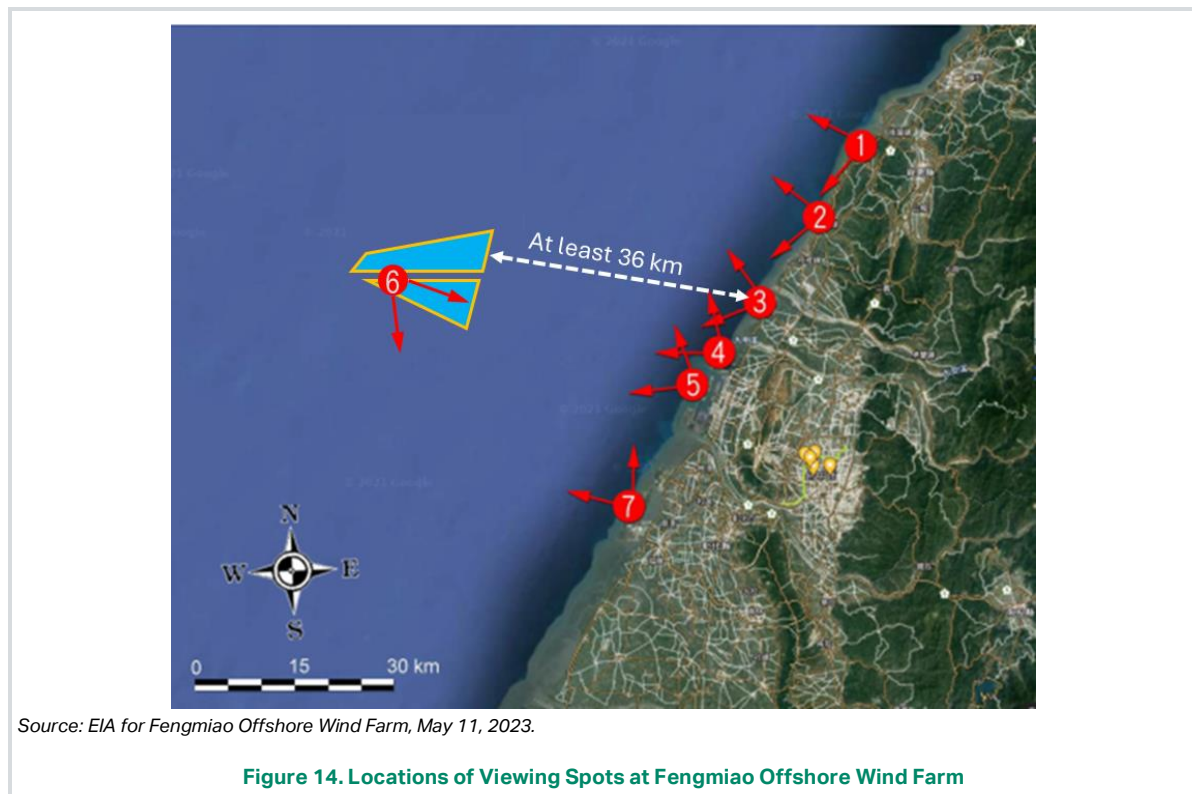
Offshore wind power projects can produce a range of visual impacts affecting various receptors, including local communities, tourists, and local tourism operators. These visual impacts typically arise from the installation of large structures of WTGs during the construction, operational and decommissioning phases. This impact can be measured using indicators such as feedback and grievance logs and stakeholder management logs.

• Onshore – Construction and Decommissioning phases

Regarding onshore construction activities, the accumulation of materials for wind turbines and submarine and land cables, as well as any exposed surfaces after site preparation, may alter the visual impression for people. Also, the installation and disassemble process of wind turbines could potentially impact the visual amenity of residents and visitors in coastal areas. The impact may temporarily arise during both the construction and decommissioning phases.

• Offshore – Operational phase

In the Project's EIA report, a scenario was set up using the maximum number of wind turbines to simulate their impact on landscape quality. This simulation considered the height, scale, and orientation of the wind turbines to assess changes in landscape quality before and after development. The Project's EIA selected seven landscape observation points for sensitivity analysis. The locations of the observation points are illustrated in **Figure 14**. These points are distributed across coastal areas with human activity, elevated viewpoints, sightseeing routes, and within the wind farm. The analysis results show that, except for Viewing Point 6, which is located within the wind farm and provides a clear view of the turbines, the other observation points are relatively far from the wind farm. The overall environmental change at these points does not exceed 0.03%, indicating a minimal or negligible impact level.



5.4.6.2 Significance of the Impact

A summary of the impact assessment is captured in **Table 52**. If this impact occurs, the geographics extent is in district level with almost no impact. Given the minor magnitude and low likelihood of occurrence, the significance of this impact is assessed as **low**.

Table 52. Social Impact Significance Matrix of Visual Landscape Quality

Impact	Visual Landscape Quality			
Geographics Extent	Household (1)	District (2)	City (3)	Region (4)
	The scope of both onshore and offshore components may have implications that are observable at the district level.			
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)
	Based on the Project's EIA, the impact on local landscape amenity is either trivial or nonexistent.			
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)
	According to the Project's EIA, the visual landscape quality will not be changed.			
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)
	Based on the assessments from the previous three categories, the magnitude of impact is classified as minor.			
Likelihood	Low	Medium	High	Definite

Impact	Visual Landscape Quality				
	This impact is unlikely to occur.				
Significance	Extremely Low	Low	Medium	High	Extremely High
	Given the minor magnitude and low likelihood of occurrence, the significance of this impact is assessed as low.				

5.4.6.3 Mitigation Measures

Given that the significance of visual landscape quality is assessed as low, the SEP and Grievance Mechanism are proposed as mitigation measures to address and manage potential impact. Attention will be given to cumulative impacts, as OWF projects collectively contribute to long-term changes in the local landscape. These changes need to be managed carefully to ensure the protection of areas with special natural and cultural value, as well as sensitive visual areas.

The construction tools and materials for the power transmission and distribution system project in the onshore area, as well as the temporary storage of waste materials, must be managed with consideration for the overall landscape during the construction period. Coordination with construction placement is essential to prevent arbitrary accumulation and to avoid damage to the existing visual landscape.

5.4.6.4 Significance of residual impact

Mitigation measures may effectively respond to complaints coming from receptors in the neighborhood, confining the impact to a small area of households. The significance of residual impact is considered to be extremely low.

5.5 Impact on Infrastructure and Services

5.5.1 Road Service

Vehicle movements during construction work can cause traffic congestion and affect road accessibility. To reduce delays to other road users and the potential for other effects on local communities adjacent to the proposed route, mitigation measures are required.

5.5.1.1 Result of Assessment

The traffic impact caused by the Project on the adjacent road system includes the commute trips of workers and HGVs transporting construction materials or filling soils. To assess the impact, the Passenger Car Equivalent (PCE), the amount of passenger cars that one specific type of vehicle is equivalent to, and the Passenger Car Unit (PCU), the average number of passenger cars per day,⁹ were calculated in the Project's EIA. The impact assessment is divided into three (3) time-periods, during construction, before operation, and during operation. According to the estimation undertaken in the Project's EIA, generally the traffic can be maintained at the same level as the current situation, while only two (2) of the intersections are affected during evening peak hours in weekdays during construction.

- **During construction**

During construction, there will be a maximum of approximately 100 onshore construction workers. Assuming that 30 % of the workers commute with cars and 70 % commute with scooters¹⁰ and the PCE is 1.0 and 0.5 for a car and a scooter respectively, it is estimated that the increased vehicle trips derived by the Project during peak hours is 65 PCU. In addition, there will be 16 one-way trips per hour for HGV during construction. Assuming that

⁹ PCU is calculated by multiplying the average number of a specific type of vehicle per day by the PCE.

¹⁰ Assumption was made based on the data of registered cars in 2023 from Highway Bureau, Ministry of Transportation and Communications (MOTC), <https://stat.thb.gov.tw/hb01/webMain.aspx?sys=220&ym=11200&yvm=11200&kind=21&type=1&funid=1110001&cycle=4&outmode=0&compmode=0&outkind=1&fldspc=0,1,10,1,27,1&rdm=R63613>, retrieved on 22 October 2024.

the PCE for one HGV is 3.0, the increased vehicle trips derived by the Project is estimated to be 48 PCU. In sum, the Project will increase 113 PCU within the Aol during peak hours when undergoing construction. According to Highway Bureau, MOTC, the average PCU within the Aol is 1,338 during peak hour, i.e., the increased PCU owing to the Project accounts for approximately 8% of the Aol's PCU.

According to the estimation in the Project's EIA, generally the traffic quality can be maintained at the same level as the current status, while the traffic quality of the Sanshun Road(三順路)/Lingang Road Section 6(臨港路六段) (Provincial Highway 17) intersection and the Yugang Road(漁港路)/Lingang Road Section 5(臨港路五段) (Provincial Highway 17) intersection are lowered by one level during evening peak hours in weekdays, as shown in **Figure 15**.



Source: Google Map.

Source: FM1, provided on 22 October 2024.

Figure 15. Sensitive Roads Nearby Project Facilities

• **During operation**

The derived traffic volume during operation mainly comes from the commute trips of the maintenance staff. No operators will be stationed during operation and there will be approximately 20 maintenance workers entering the wind turbine area. Assuming that 30% of the workers commute with cars and 70% commute with scooters and the PCE is 1.0 and 0.5 for a car and a scooter respectively, it is estimated that the increased vehicle trips derived by the Project during peak hours is 13 PCU, lower than 1% of the Aol's PCU. According to the estimation, the traffic quality can be maintained at the same level as the status before operation. Note that the estimation of traffic quality before operation is conducted with the average annual growth rate of vehicles in Taichung City from 2015 to 2020.

5.5.1.2 Significance of the Impact

As the impact on transportation and road are different during construction and operation, the significance assessments are conducted separately.

• **During construction**

For the period of construction / decommissioning, generally the traffic quality can be maintained at the same level as the current situation, while the traffic quality of two intersections is lowered by one level during evening peak hours in weekdays. The geographic scope of impact is expected to be limited to the district level, while the impact is expected to be present daily during construction. Given the minor magnitude and medium likelihood

of occurrence, the significance of the impact is assessed to be **medium**. A summary of the impact assessment is captured in **Table 53**.

Table 53. Social Impact Significance Matrix of Transportation and Road (During Construction)

Impact	Transportation and Road			
	Household (1)	District (2)	City (3)	Region (4)
Geographics Extent	The scope may have implications that are observable at the district level.			
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)
	According to the estimation undertaken in the Project's EIA, generally the traffic quality can be maintained at the same level as the current situation, while the traffic quality of two (2) intersections are lowered by one level during evening peak hours in weekdays.			
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)
	The impact will occur during construction and decommissioning phases.			
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)
	Based on the assessments from the previous three categories, the magnitude of impact is classified as minor.			
Likelihood	Low	Medium	High	Definite
	The impact will occur daily, while only two intersections located within the Aol are estimated to be affected during the peak hours. Some road accessibility may be restricted during construction.			
Significance	Extremely Low	Low	Medium	High
	Given the minor magnitude and the medium likelihood of occurrence, the significance of this impact is assessed as medium.			

• During operation

For the period of operation, as there will be only 20 maintenance workers during operation, the traffic quality within the Aol is estimated not to be affected during the peak hours. The geographic scope of impact is expected to be limited to the district level. While the impact is expected to be present daily, the likelihood of traffic congestion is low. Given the minor magnitude and low likelihood of occurrence, the significance of the impact is assessed to be **low**. A summary of the impact assessment is captured in **Table 54**.

Table 54. Social Impact Significance Matrix of Transportation and Road (During Operation)

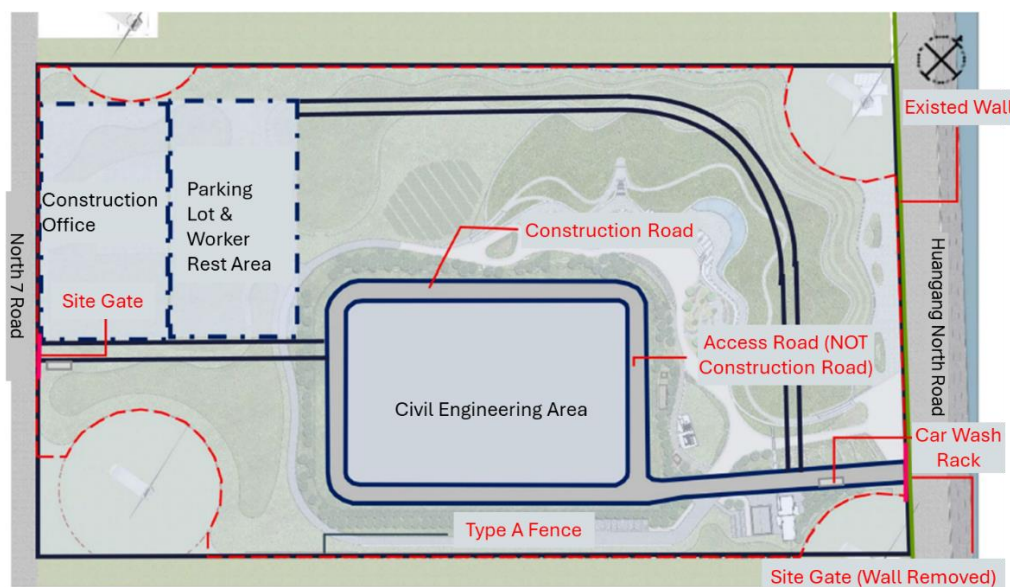
Impact	Transportation and Road			
	Household (1)	District (2)	City (3)	Region (4)
Geographics Extent	The scope may have implications that are observable at the district level.			
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)
	According to the estimation undertaken in the Project's EIA, the traffic quality can be maintained at the same level as the status before operation.			
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)
	The impact will occur during operation phase.			
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)
	Based on the assessments from the previous three categories, the magnitude of impact is classified as minor.			
Likelihood	Low	Medium	High	Definite
	The impact will occur daily, while the traffic quality within the Aol is estimated not to be affected during the peak hours, making the likelihood of traffic congestion low.			

Impact	Transportation and Road				
	Extremely Low	Low	Medium	High	Extremely High
Significance	Given the minor magnitude and the low likelihood of occurrence, the significance of this impact is assessed as low.				

5.5.1.3 Mitigation Measures

The SEP provides mitigation measures to manage impacts, e.g., the proactive engagement and grievance mechanism accessible by stakeholders help to identify any potential related issues early and to achieve an appropriate solution. In addition, the mitigation measures listed in the Project's EIA and CHSSP to manage transportation and road impacts during construction, which is assessed to have medium significance, are summarized below.

- A traffic management plan will be developed. Applicable measures include planning alternative roads, setting up signboards, and assigning personnels to divert traffic to facilitate people's entry and exit. Use only approved access routes or the planned routes. Please refer to **Figure 16** for the site arrangements.
- Flexibly adjust transportation times and reduce travelling during peak hours.
- The road conditions along the route will be checked as often as possible during construction. The road surface of the route travelled by construction machinery and vehicles will be maintained in good condition.
- The body of HGVs will be clearly marked to allow the public to easily identify the construction management responsibilities.
- The earthwork transportation for the transmission line constructions will not exceed 8 hours per day and will avoid peak hours.



Source: FM1, provided on 22 October 2024.

Figure 16. Onshore Site Map

5.5.1.4 Significance of residual impact

The Project's proactive approach to managing traffic impact, along with targeted engagement and mitigation strategies, effectively minimizes the potential negative consequences of traffic related to construction and decommissioning. Although some localized and temporary impacts are anticipated, this systematic management approach reduces both the frequency and overall significance of these impacts to a "low" level.

5.5.2 Health Service

The influx of workforce may impact on the local medical service capacity, resulting in existing services and infrastructure not being able to meet the needs/ demand of the local communities.

5.5.2.1 Result of Assessment

According to the Project's EIA, during construction phase, the demand for public facilities is mainly on the medical services. Emergency situations, such as health and safety accidents, can place pressure on existing infrastructure and services, in particular emergency responders and health care providers. It is estimated there will be at most 100 on-site workers at the same time during construction. The Project will utilize regional hospitals or clinics near the Project sites as the support of emergency response. As noted in the baseline, there is an established medical system within the Aol and Taichung City. It is anticipated that the Project will not have evident impact on existing supply of local medical service. During operation phase, there will be no on-site operators, so there will be no impact on local services.

5.5.2.2 Significance of the Impact

As the workforce should be at its peak during construction phase and will decrease substantially to during operation phase, the impact will mainly be limited in short-term period, with the district level of geographic scope of impact. It is estimated there will be at most 100 on-site workers at the same time during construction, which is anticipated not to have evident impact on existing supply of local medical service. Given minor magnitude and low likelihood of occurrence, the significance of the impact is assessed to be **low**. A summary of the impact assessment is captured in **Table 55**.

Table 55. Social Impact Significance Matrix of Health Service

Impact	Health Service			
	Household (1)	District (2)	City (3)	Region (4)
Geographics Extent	The Project will utilize regional hospitals or clinics near the site.			
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)
	It is estimated there will be at most 100 on-site workers at the same time during construction, which is anticipated not to have evident impact on existing supply of local medical service.			
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)
	The impact will mainly be present during construction phase.			
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)
	Based on the assessments from the previous three categories, the magnitude of impact is classified as minor.			
Likelihood	Low	Medium	High	Definite
	In usual case, there is low possibility for accident or emergency to happen.			
Significance	Extremely Low	Low	Medium	High
	Given the minor magnitude and the low likelihood of occurrence, the significance of this impact is assessed as low.			

5.5.2.3 Mitigation Measures

The mitigation measures to manage health service impacts listed in the CHSSP are summarized below. In addition, the SEP also provides mitigation measures to manage impacts, e.g., the proactive engagement and grievance mechanism accessible by stakeholders help to identify any potential related issues early and to achieve an appropriate solution.

- By introducing and maintaining high standards of first aid and access to suitably qualified medical personnel, it increases the level of care and emergency response levels.
- Being able to provide efficient response and ongoing care on the Project reduces the risk to local communities and other stakeholders, as the probability of ongoing use of local medical facilities can be lowered.

- As part of the Employers Requirements, the onshore contractors are required to provide adequate first aid and / or medical facilities and a suitable and sufficient number of first aiders and / or medics.

5.5.2.4 Significance of residual impact

With the mitigation measures in place, the impact's magnitude may be mitigated to "negligible", resulting in an extremely low significance of residual impact.

5.5.3 Waste Disposal Service

The Project may generate a large volume of waste, resulting in existing waste disposal services and infrastructure not being able to meet the needs/ demand of the local communities.

5.5.3.1 Result of Assessment

According to BAS of Taichung City Government, there are 0.659 kg garbage generated per person per day and 1,993.63 tons waste incinerated per day by three (3) public-owned incineration plants in Taichung City in 2023. The designed capacity of each incineration plant is 900 tons per day.

- During construction**

It is estimated that there will be at most 100 on-site workers at the same time, resulting in approximately 65.9 kg waste generated per day. As stated in the EMP, each contractor will be required to prepare their own waste management plan. It is not expected the sanitary waste generated by workers would cause burden to local waste disposal service.

- During operation**

No operators will be stationed during operation, so there will not be waste generated.

- During decommissioning**

There will be a large volume of waste, which can place pressure on local waste disposal service. According to the Project's EIA, it is estimated that, based on so far as reasonably practicable technology, 60 % to 80 % of the wind turbine (such as tower, foundation structure) and offshore substation can be recycled, while the blades are not recyclable due to the composite material.

5.5.3.2 Significance of the Impact

As the impact on waste disposal service varies with the Project's phases, the significance assessments are conducted separately, while the impact during operation is not expected and thus is exempted from assessment. For the period of construction, in usual case, the sanitary waste generated by workers should not cause burden to local waste disposal service, as there will be at most 100 on-site workers at the same time. The geographic scope of impact is expected to be limited to the district level. Given the minor magnitude and low likelihood of occurrence, the significance of the impact is assessed to be **low**. A summary of the impact assessment is captured in **Table 56**.

Table 56. Social Impact Significance Matrix of Waste Disposal Service (During Construction)

Impact	Waste Disposal Service			
	Household (1)	District (2)	City (3)	Region (4)
Geographics Extent	The scope may have implications that are observable at the district level.			
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)
	It is estimated there will be at most 100 on-site workers at the same time during construction, which is anticipated not to have evident impact on existing supply of local waste disposal service.			
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)
	The impact will mainly be present during construction phase.			
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)

Impact	Waste Disposal Service			
	Based on the assessments from the previous three categories, the magnitude of impact is classified as minor.			
	Low	Medium	High	Definite
Likelihood	Given at most 100 on-site workers at the same time during construction, there is low possibility for large amount of sanitary waste generated.			
	Extremely Low	Low	Medium	High
Significance	Given the minor magnitude and the low likelihood of occurrence, the significance of this impact is assessed as low.			

During decommissioning phase, it is estimated 20 % to 40 % of the wind turbine and offshore substation cannot be recycled, and the blades are not recyclable, resulting in an expected large volume of waste, which can place pressure on local waste disposal service. Given moderate magnitude and medium likelihood of occurrence, the significance of the impact is assessed to be **medium**. A summary of the impact assessment is captured in **Table 57**.

Table 57. Social Impact Significance Matrix of Waste Disposal Service (During Decommissioning)

Impact	Waste Disposal Service			
	Household (1)	District (2)	City (3)	Region (4)
Geographics Extent	The scope may have implications that are observable at the district level.			
	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)
Scale of Intensity	There will be a large volume of waste, which can place pressure on local waste disposal service.			
	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)
Duration	The impact will mainly be present during decommissioning phase.			
	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)
Magnitude	Based on the assessments from the previous three categories, the magnitude of impact is classified as moderate.			
	Low	Medium	High	Definite
Likelihood	It is estimated 20 % to 40 % of the wind turbine and offshore substation cannot be recycled, and the blades are not recyclable, based on current technology.			
	Extremely Low	Low	Medium	High
Significance	Given the moderate magnitude and the medium likelihood of occurrence, the significance of this impact is assessed as medium.			

5.5.3.3 Mitigation Measures

The mitigation measures to manage waste disposal service impacts include:

- The waste generated on site by workers will be collected and segregated to facilitate recycling.
- Adopt the latest available and commercialized technology to renovate and then reuse, recycle or upcycle suitable materials at the time of decommissioning phase. If not applicable, such as components containing environmentally hazardous substances, the materials will be entrusted to professional handlers for removal.
- Implement the proactive engagement in the SEP and develop grievance mechanism accessible by stakeholders to identify any potential related issues early and to achieve an appropriate solution.

5.5.3.4 Significance of residual impact

By using proper design materials and implementing effective disposal procedures, the adverse impact will be substantially minimized, resulting in a negligible magnitude and an extremely low significance of residual impact. Furthermore, it is recommended that the evaluation of residual impact during the decommissioning phase be conducted 2 years prior to the decommission phase, allowing for the preparation of further mitigation measures based on the conditions at that time.

5.6 Impact on Labor and Working Condition

5.6.1 Work Force

According to IFC PS2, requirements relating to workforce include child labor and forced labor. Given the vulnerability of migrant workers in human right issues, please refer to [Section 5.6.2.4](#) for issues relating to migrant workers.

The Labor Standard Act defines a worker over 15 years old, but less than 16 years old, as a child labor. Employment of any person under the age of 15 is not allowed. Labor under the age of 18 shall not be permitted to do potentially dangerous or hazardous work. IFC PS2 requires that children in any manner that is economically exploitative or is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development should not be employed.

Forced labor, which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty, should not be employed, based on the requirement of IFC PS 2. Forced labor covers any form of involuntary or compulsory labor, including bonded labor and trafficked persons.

5.6.1.1 Result of Assessment

It is estimated there will be at most 100 on-site workers at the same time during construction, while the workforce will decrease substantially to 20 personnel for maintenance work during operation. If safeguards are not in place, a range of potential impacts can arise, such as potential employment of child, forced or bonded labor. This impact extends to employees directly engaged by the Project, contractors and suppliers, and workers located within the Project's supply chain.

As noted in the baseline analysis, the Project, by adhering to the regulatory requirements in Taiwan, can ensure the protection of workers and the safeguarding of their rights in accordance with globally recognized standards. Besides, Taiwan was put on the *2024 Trafficking in Persons Report's Tier Placements List*¹¹ as Tier 1 countries in human trafficking by the U.S. Department of State, indicating that human trafficking is not a significant issue in Taiwan. According to the HRIS, forced labor is identified as high-risk relative to other human right issues of the Project due to the nature of work in offshore wind farm industry.

5.6.1.2 Significance of the Impact

The risk will be present throughout the Project's lifecycle, including construction, operation and decommissioning phases. The geographic scope of impact is expected to be limited to the Project scope. Lack of safeguard measures can have impact on workers' human rights, while forced labor issue is not a significant issue in Taiwan. Given the moderate magnitude and low likelihood, the significance of the impact is assessed to be **low**. A summary of the impact assessment is captured in [Table 58](#).

Table 58. Social Impact Significance Matrix of Work Force

Impact	Work Force			
	Household (1)	District (2)	City (3)	Region (4)
Geographics Extent	The impact is limited to the Project scope.			
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)
	Lack of safeguard measures can have impact on workers' human rights.			
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)
	The impact will be present throughout the Project's lifecycle.			
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)

¹¹ <https://www.state.gov/reports/2024-trafficking-in-persons-report/>, retrieved on 23 September 2024.

Impact		Work Force			
		Based on the assessments from the previous three categories, the magnitude of impact is classified as moderate.			
Likelihood		Low	Medium	High	Definite
	Forced labor issue is not a significant issue in Taiwan.				
Significance		Extremely Low	Low	Medium	High
				Extremely High	
		Given the moderate magnitude and the low likelihood of occurrence, the significance of this impact is assessed as low.			

5.6.1.3 Mitigation Measures

According to the HRIS, the Project is committed to complying with the core labor standards of the ILO regarding all forms of bonded labor and forced labor. The Environmental and Social Policy (E&S Policy) and Code of Conduct for Business Partners have been established which include social policy regarding forced, bonded or child labor, as detailed below:

- The Project and its suppliers and contractors are required to take necessary steps and adopt all required measures to avoid and prevent all forms of forced, bonded or child labor and other types of human rights abuses in their operations and in labor that is sourced by the Partner via contractor agencies or labor brokers.
- Any person below the minimum legal hiring age limits or the mandatory age for completing schooling, whichever is higher, will not be employed. The Project is committed to protect workers under the age of 18 from work which is regarded hazardous by applicable laws and regulations.
- The Project will ensure no forced labor, including prison or debt bondage labor, and no lending of money (debt slavery) or withholding of remuneration or identity papers by employers or outside recruiters.

As stated in the E&S Policy, the Project will provide a grievance mechanism for all workers and inform the workers of the grievance mechanism at the time of recruitment and make it easily accessible to them. The Project will also ensure that contracted workers have access to a grievance mechanism. In cases where the third party is not able to provide a grievance mechanism the Project will extend its own grievance mechanism to serve workers engaged by the third party.

To manage potential risks in the supply chain, the Project will employ a risk-based approach to assess the compliance of Partners with the Code of Conduct, including risk-based screening and assessment of Partners by reference to sectors and countries of operation. If breaches of the Code of Conduct are identified, the Project will handle these in accordance with applicable laws and regulations and the respective contract with the Partner (and reserves any right to pursue a termination of the business relationship) or open a dialogue with the relevant Partner with the aim of agreeing on a plan to improve the situation.

ESG Questionnaire for Potential Contractors will be issued during the procurement process to understand the level of sophistication of each contractor with respect to its approach to ESG topics, including forced labor and child labor issues. Besides, ESG Reporting Requirements for Contractors is developed which requires contractors to report issues including respect for human rights annually.

5.6.1.4 Significance of residual impact

Implementing the mitigation measures may reduce the magnitude of impact to “minor”, leading to low significance to residual impact.

5.6.2 Working Conditions and Management of Worker Relationship

Based on IFC PS2, the Project should provide workers with fair and equal working conditions for work of equal value and should not discriminate with respect to any aspects of the employment relationship. Where accommodation services are provided to workers, policies on the quality and management of the

accommodation should be in place and basic services should be provided in a manner consistent with the principles of non-discrimination and equal opportunity. Workers' accommodation arrangements should not restrict workers' freedom of movement or association. Measures to prevent and address harassment, intimidation, and/or exploitation, especially in regard to women, should be taken.

Given the vulnerability of migrant workers in human right issues, please refer to **Section 5.6.2.4** for issues relating to migrant workers.

5.6.2.1 Result of Assessment

Issues with impact on workers' human rights regarding working conditions include being forced to take compensatory leave instead of getting overtime pay, discrimination within the workplace and in the hiring process, prevention of workers joining unions or taking part in collective bargaining, health and safety risks due to excessive working hours and insufficient breaks, inappropriate or delayed payments to workers.

As noted in the baseline, by adhering to the regulatory requirements in Taiwan, the Project can ensure the protection of workers and the safeguarding of their rights in accordance with globally recognized standards, while working condition is identified as high-risk relative to other human right issues of the Project due to the nature of work in OWF industry. According to the HRIS, some suppliers only offer workers compensation leave instead of overtime payment, which is not aligning with LSA in Taiwan, while the information about labor laws violation in the past 3 years is unavailable in the HRIS during the time of this assessment.

5.6.2.2 Significance of the Impact

The risk will be present throughout the Project's lifecycle, including construction, operation, and decommissioning phases. The geographic scope of impact is expected to be limited to the Project scope. Lack of safeguard measures can have impact on workers' human rights. By adhering to the regulatory requirements in Taiwan, the Project can ensure the protection of workers and the safeguarding of their rights in accordance with globally recognized standards. Given the moderate magnitude and low likelihood, the significance of the impact is assessed to be **low**. A summary of the impact assessment is captured in **Table 59**.

Table 59. Social Impact Significance Matrix of Working Conditions and Management of Worker Relationship

Impact	Working Conditions and Management of Worker Relationship				
Geographics Extent	Household (1)	District (2)	City (3)	Region (4)	
	The impact is limited to the Project scope.				
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)	
	Lack of safeguard measures can have impact on workers' human rights.				
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)	
	The impact will be present throughout the Project's lifecycle.				
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)	
	Based on the assessments from the previous three categories, the magnitude of impact is classified as moderate.				
Likelihood	Low	Medium	High	Definite	
	By adhering to the regulatory requirements in Taiwan, the Project can ensure the protection of workers and the safeguarding of their rights in accordance with globally recognized standards.				
Significance	Extremely Low	Low	Medium	High	Extremely High
	Given the moderate magnitude and the low likelihood of occurrence, the significance of this impact is assessed as low.				

5.6.2.3 Mitigation Measures

Indicated in the ESMP, the Project requires that the Maritime Labor Convention must be adopted as appropriate and carried out as applicable to ensure decent conditions of work, including minimum age, employment agreements, hours of work and rest, payment of wages, paid annual leave, repatriation, on board medical care, the use of recruitment and placement services, accommodation, food and catering, health and safety protection and accident prevention, and complaint procedures.

The Project has developed Code of Conduct for Business Partners, the Taiwan Employee Handbook, and E&S Policy which sets out its approach to manage workers. These documents are applicable to all phases and functional aspects of the work scope during the life of the Project, covering issues such as hiring and employment, non-discrimination and equal opportunity, bullying, harassment and abuse, retrenchment, and grievance mechanism. The E&S Policy also applies to all workers as well as appointed suppliers and contractors in their execution of work for the Project. The mitigation measures are summarized in **Table 60**.

ESG Questionnaire for Potential Contractors will be issued during the procurement process to understand the level of sophistication of each contractor with respect to its approach to ESG topics, including working condition issues. Besides, ESG Reporting Requirements for Contractors is developed which requires contractors to report issues including respect for human rights annually. If breaches of the Code of Conduct are identified, the Project will handle these in accordance with applicable laws and regulations and the respective contract with the Partner (and reserves any right to pursue a termination of the business relationship) or open a dialogue with the relevant Partner with the aim of agreeing on a plan to improve the situation.

Table 60. Mitigation Measures for Working Condition

Issue	Mitigation Measure
Hiring practices	<ul style="list-style-type: none"> All workers are to be provided with a written contract in a language they understand, and the documented information includes their rights related to hours of work, wages, overtime, compensation, duration and benefits upon beginning the working relationship and when material changes occur. Information relating to workers' contract provisions will be provided to candidates during hiring, and knowledge of labour rights is to be reinforced on an ongoing basis. Workers are not to be charged any fees related to recruitment or employment. In the event such payments have been made, they will be refunded.
Wages and benefits	<ul style="list-style-type: none"> The Project is committed to payment of rates of wages and benefits in accordance with industry standards, applicable laws, and regulations and/or any applicable collective bargaining agreements. Payment must include wages, overtime (if applicable), and paid leave. Wages are required to be paid directly to the worker and preferably on a predefined day. A pay slip must be issued at the end of every pay period specifying the calculation including rate of compensation, benefits, and legitimate deductions.
Working hours	Ensure that normal working hours, meal breaks, rest periods, overtime, leave, maternity and paternity leave, and compassionate leave are in accordance with industry standards, applicable laws and regulations.
Freedom of association and collective bargaining	The Project respect workers' freedom of union association and their right to collective bargaining, which includes negotiating in good faith and not discriminating against workers who decide to affiliate with any collective bargaining association or equivalent.
Worker freedom	Allow workers to move freely during their employment and terminate their employment subject to reasonable notice periods without incurring unreasonable or unlawful penalties.
Worker accommodation	<p>According to the CHSSP, the requirements regarding accommodation include:</p> <ul style="list-style-type: none"> As part of the Project's Employers Requirements, it is required for all contractors to provide suitable and sufficient accommodation to relevant personnel free of charge at all sites, including suitable and sufficient toilets, facilities to adequately rest such as air conditioning, fresh drinking water, facilities to eat, wash (hot and cold water), store personal items and wash and dry clothing. All provisions will be legally compliant. The accommodation facilities on board vessels will be checked by the Project as part of the vessel inspection process and will be subject to ongoing monitoring, in line with the Maritime Labor Convention, 2006. Contractors who shall provide accommodation for personnel staying in temporary accommodation such as hotels as part of business travel, rotation/shift changes will be required to provide their plans and process to the Project for accommodating personnel. The Project will undertake camp and vessel inspections of the accommodation facilities provided in the local communities and vessel accommodation in advance of the works commencing to ensure that they meet the Project requirements. HSE Camp Inspection Form is developed.

Issue	Mitigation Measure
	As stated in the E&S policy, the accommodation services will be provided in a manner consistent with the principles of non-discrimination and equal opportunity. Workers' accommodation arrangements will not restrict workers' freedom of movement or of association.
Retrenchment	The Project will follow a fair and transparent process when retrenchment is required to ensure that all affected workers receive notice of dismissal and severance payments as required by law and collective agreements in a timely manner.
Grievance mechanism	<ul style="list-style-type: none"> The Project will provide a grievance mechanism for all workers and inform the workers of the grievance mechanism at the time of recruitment and make it easily accessible to them. The mechanism will involve an appropriate level of management and address concerns promptly, using an understandable and transparent process that provides timely feedback to those concerned, without any retribution. Anonymous complaints are also accepted. The Project will also ensure that contracted workers have access to a grievance mechanism. In cases where the third party is not able to provide a grievance mechanism the Project will extend its own grievance mechanism to serve workers engaged by the third party.

5.6.2.4 Significance of residual impact

Implementing the mitigation measures may reduce the magnitude of impact to a "minor" level, resulting in a low significance of residual impact.

5.6.3 Migrants Rights

The International Convention on the Protection of the Rights of All Migrant Workers and Members of their Families establishes how migrant workers and their families should be protected. IFC PS 2 requires ensuring migrant workers are engaged on substantially equivalent terms and conditions to non-migrant workers carrying out similar work. The principles of non-discrimination apply to migrant workers as well.

5.6.3.1 Result of Assessment

As indicated in the baseline, almost 11 % of the migrant workers are missing in Taiwan. The missing migrant workers can pose an issue to human rights violations as it is difficult to track and follow when they are not working at the designated site. The issue of the significant number of the missing migrant workers in Taiwan remains a risk to the Project. Hence, migrant worker management is important to the Project to minimize the human rights violation risk.

According to the HRIS, migrant workers are particularly vulnerable to human right issues, especially exploitation and debt burdens during the recruitment process and the right to life and security issues. Common practices in Taiwan that have impact on migrant workers' human right include agencies charging fees to migrant workers, identity documents and passport of the migrant workers being kept by employers, and restricted freedom of movement after working hours.

Reportedly, the tier one contractors may involve migrant workers in construction works, while the information about labor laws violation in the past 3 years is unavailable in the HRIS during the time of this assessment. According to the HRIS, there are issues identified regarding employees' freedom of movement. Meanwhile, some suppliers have a deposit account to ensure that workers have sufficient funds to purchase air tickets back to their home countries and to prevent them from being financially burdened by debts. It is recommended to establish a policy or announcement to ensure the right to use personal documents at any time in the future.

5.6.3.2 Significance of the Impact

As migrant workers may be involved in construction work, the risk of forced labor or bonded labor will be present during the construction phase. The geographic scope of impact is expected to be limited to the Project scope. Lack of safeguard measures can have impact on workers' human rights. Based on the assessment, the migrant workers in Taiwan might face risks such as debt burdens during the recruitment process, restricted freedom of movement, and the significant number of the missing migrant workers in Taiwan remains a risk to the Project. Given the minor magnitude and a medium likelihood, the significance of the impact is assessed to be **medium**.

Table 61. Social Impact Significance Matrix of Migrants Rights

Impact	Migrants Rights			
	Household (1)	District (2)	City (3)	Region (4)
Geographics Extent	The impact is limited to the Project scope.			
Scale of Intensity	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)
	Lack of safeguard measures can have impact on workers' human rights.			
Duration	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)
	The impact will be present during the construction phase.			
Magnitude	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)
	Based on the assessments from the previous three categories, the magnitude of impact is classified as minor.			
Likelihood	Low	Medium	High	Definite
	In the context of Taiwan, migrant workers might face risks such as debt burdens during the recruitment process, restricted freedom of movement.			
Significance	Extremely Low	Low	Medium	High
	Given the moderate magnitude and the medium likelihood of occurrence, the significance of this impact is assessed as medium.			

5.6.3.3 Mitigation Measures

The Project has developed the E&S Policy which sets out its approach to manage workers. The document is applicable to all phases and functional aspects of the work scope during the life of the Project, and applies to all workers, including migrant workers. The mitigation measures are summarized below:

- The Project will ensure no forced labor, including prison or debt bondage labor, and no lending of money (debt slavery) or withholding of remuneration or identity papers by employers or outside recruiters.
- The accommodation services, if any, will be provided in a manner consistent with the principles of non-discrimination and equal opportunity. Workers' accommodation arrangements will not restrict workers' freedom of movement or of association.
- The Project allows workers to move freely during their employment and terminate their employment subject to reasonable notice periods without incurring unreasonable or unlawful penalties.
- The Project and its suppliers and contractors will provide a grievance mechanism for all workers and inform the workers of the grievance mechanism at the time of recruitment and make it easily accessible to them. The Project will also ensure that contracted workers have access to a grievance mechanism. In cases where the third party is not able to provide a grievance mechanism the Project will extend its own grievance mechanism to serve workers engaged by the third party.

To manage potential risks in the supply chain, the Project will employ a risk-based approach to assess the compliance of Partners with the Code of Conduct, including risk-based screening and assessment of Partners by reference to sectors and countries of operation. If breaches of the Code of Conduct are identified, the Project will handle these in accordance with applicable laws and regulations and the respective contract with the Partner (and reserves any right to pursue a termination of the business relationship) or open a dialogue with the relevant Partner with the aim of agreeing on a plan to improve the situation.

ESG Questionnaire for Potential Contractors will be issued during the procurement process to understand the level of sophistication of each contractor with respect to its approach to ESG topics, including forced labor and child labor issues. Besides, ESG Reporting Requirements for Contractors is developed which requires contractors to report issues including respect for human rights annually.

5.6.3.4 Significance of residual impact

Although there is a possibility of labor rights violations, the implementation of the E&S Policy, along with comprehensive mitigation strategies, can greatly reduce the likelihood and potential impact of migrant worker exploitation. By adopting a systematic approach coupled with ongoing monitoring and reporting, the project can effectively manage and minimize any adverse effects on the rights of migrant workers. The potential for residual impact is deemed to be low.

5.6.4 Occupational Health and Safety

IFC PS2 highlights the need for ensuring a safe and healthy work environment, taking into account inherent risks in its particular sector and specific classes of hazards in the client's work areas, including physical, chemical, biological, and radiological hazards, and specific threats to women. Unsafe working environment can cause unrecoverable impact on workers' life and wellbeing.

5.6.4.1 Result of Assessment

Since the Project includes both onshore and offshore works, it may be affected by natural factors such as sea conditions, weather, earthquakes, typhoons and heavy rains, which will increase the difficulty and risk of foundation excavation, wind turbine installation and other engineering work during construction. According to Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution by the International Finance Corporation (IFC), working at heights, over-exertion, slip and falls, being struck by objects, moving machinery, dust and confined spaces, and excavations are common occupational health and safety risk. The risks of the Project have been identified for the construction, operation, and decommissioning phases based on the Project's EIA and the CCRA, which are summarized in **Table 62**.

Table 62. Risk Assessment of Occupational Health and Safety

Issue	Phase	Risk Assessment
Respiratory diseases	Construction	<ul style="list-style-type: none"> Dust and particulate emissions: Construction activities e.g., blasting, excavation, concrete mixing, cutting involve significant amount of air pollutant emissions, posing the risk of health hazards to workers constantly exposed to such emissions. Obnoxious gases: Acetylene, phosgene, carbon monoxide, ozone, nitrogen oxides and fine respirable metal particulates formed in welding activities can cause acute or chronic problems and affect the central nervous system, brain, kidney, liver on long-term exposure.
Hearing damage	Construction	Workers involved in activities like blasting, metal cutting are exposed to sudden and continuous loud noise, which pose risks of hearing impairment, ear damage, and irreversible hearing loss if proper protective measures are not taken.
Ergonomic injuries	Construction	Improper postures, forceful exertion or strain, exposure to vibration and sudden shocks during construction can affect the muscles, nerves, tendons, ligaments, joints, cartilage and spinal discs.
Hot work	Construction	<ul style="list-style-type: none"> Eye injuries: Flash or sparks emanating from the welding arc and prolonged exposure to intense visible light can cause retina damage or photokeratitis if eyes are insufficiently protected. Burns: Exposure to infrared and UV radiation produced by the electric arc and other flame cutting equipment may result in thermal burns.
Electrical work	Construction, operation, decommissioning	Electrical operations, including laying down transmission lines, connecting the power lines to grid substations, and maintenance activities, pose the risks such as electrical shocks, electrical burns, fire and/or explosion hazard.
Extreme weather events	Construction, operation, decommissioning	<ul style="list-style-type: none"> Extreme heat events: Working under high temperature conditions may cause heat stress, including heat stroke, heat exhaustion, rhabdomyolysis, heat syncope, heat cramps or heat rash. There may be fewer shelters and higher likelihood to work outdoors in offshore construction or maintenance activities, making the risk more material. Medical aid is limited and emergency transportation is time-consuming due to remoteness of the offshore site, which makes the personnels vulnerable. Extreme cold events: Working under low temperature conditions may cause fatigue, limb numbness or respiratory symptoms. The Project site is located in the Taiwan Strait and coastal area of Taichung City, where it is

Issue	Phase	Risk Assessment
		known for windy weather. While the temperature is not significantly low in Taiwan, the personnel working in the Project area may still be impacted when staying in an outdoor environment and being directly exposed to low temperature for longer periods of time.
Coastal flood	Construction, decommissioning	According to the CCRA, coastal floods could take place not only under typhoon or extreme precipitation events but also during spring tide individually, which could leave personnels unaware of being exposed to the risk. There may be safety and health concerns if being struck by abrupt sea water intrusion, especially for the construction phase where the personnels might face difficulty in finding shelters in a short time. During operation phase, personnels can easily find shelters to prevent from being affected by coastal floods, making the risk immaterial.
Accidents	Construction, operation, decommissioning	<ul style="list-style-type: none"> Crane failure owing to excessive loads can lead to severe injuries and fatality. Road accidents due to vehicle movement on uneven terrains, overturning due to carriage of loads in excess of safe limits, and over-speeding can lead to physical injuries and fatality. Trip over/fall due to debris or stuffs lying in the walkway/passages can lead to physical injuries. Fall or slip from ladders when working at height, such as assembly of wind turbine components, maintenance activities, may result in injuries ranging from muscle sprain, ligament tear to fractures or fatality. Sea water might splash onto the working platforms or during the personnels transferring between offshore structures and the vessels and cause slip or even man overboard due to random high waves. Fires may be caused by electrical fault, malfunctions of machinery and equipment, or not cleaning up flammable materials or cigarette butts.

Source: Fengmiao I Supplementary Lenders Information Package Documentation – CCRA, by NIRAS, 12 July 2024; ESIA of Mytrah Energy 105 MW Wind Power Project, by AECOM India Pvt Ltd, November 2015.

5.6.4.2 Significance of the Impact

The risk will be present throughout the Project's lifecycle, including construction, operation and decommissioning phases. The geographic scope of impact is expected to be limited to the Project scope. The Project includes both onshore and offshore works, the risk is evident, and the potential outcome of this impact can be catastrophic, if no proper mitigation measures are applied. Given the moderate magnitude and medium likelihood, the significance of the impact is assessed to be **medium**. A summary of the impact assessment is captured in **Table 63**.

Table 63. Social Impact Significance Matrix of Occupational Health and Safety

Impact	Occupational Health and Safety			
	Household (1)	District (2)	City (3)	Region (4)
Geographics Extent	The occupational health and safety impact is limited to the Project scope.			
	None (1) (No impact)	Low (2) (No substantial effects)	Medium (3) (Moderate effects)	High (4) (Extensive effects)
Scale of Intensity	The potential outcome of this impact can be catastrophic, such as injury or fatality, while the severely impacted receptors is expected limited.			
	Temporary (1) (<1 year)	Short-term (2) (1-5 years)	Long-term (3) (project lifecycle)	Permanent (4)
Duration	The impact will be present throughout the Project's lifecycle, including construction, operation and decommissioning phases.			
	Negligible (3)	Minor (4-6)	Moderate (7-8)	Major (9+)
Magnitude	Based on the assessments from the previous three categories, the magnitude of impact is classified as moderate.			
	Low	Medium	High	Definite
Likelihood	Since the Project includes both onshore and offshore works, the risk is evident if no proper mitigation measures are applied.			

	Extremely Low	Low	Medium	High	Extremely High
Significance	Given the moderate magnitude and the medium likelihood of occurrence, the significance of this impact is assessed as medium.				

5.6.4.3 Mitigation Measures

According to the E&S Policy, the Project has developed Health and Safety (H&S) Policy and H&S Management Plan. The H&S Management Plan describes potential the hazards and preventive measure related to the Project's activities also details the minimum standard and training plan for workers, mainly contractors and sub-contractors. The mitigation measures outlined in EIA, CHSSP, CCRA, and HRIS to manage occupational health and safety impacts are summarized in **Table 64**.

Table 64. Mitigation Measures of Occupational Health and Safety

Category	Mitigation Measure
Policy	<ul style="list-style-type: none"> A HSE guideline will be established which includes: 1) identification of potential hazards to works; 2) provision of preventive and protective measures; 3) training of workers; 4) documentation and reporting of occupational accidents, diseases and incidents; 5) emergency prevention, preparedness and response arrangement. The guideline will be acquainted and approachable for all personnels. A strict Drug and Alcohol Policy has been implemented in a no tolerance approach and all contractors are required to implement their own drug and alcohol screening process. An HSE Observation Card System has been developed to prevent and rectify any potential problems before they cause serious injury or harm and to spread the message regarding good practices. An ERP has been developed to minimize casualties, mitigate damage, and facilitate recovery from an incident. All personnel have the authority to stop the work if they believe they have witnessed an unsafe situation or act.
Risk assessment	<ul style="list-style-type: none"> Ensure contractors that all activities have a suitable and sufficient Risk Assessment and Method Statement (RAMS). All RAMS will be reviewed by the site teams prior to commencing work to check if anything on the day has changes that impact upon the safety of the personnel. All interviewed suppliers in the process of HRIS are going to conduct occupational safety and health risk assessments or Job Hazardous Analysis (JHA) to identify common occupational hazards and diseases and provide response policies or measures in the Project. Develop plans for different working environment, such as working at height and working over water.
Equipment and facility	<ul style="list-style-type: none"> Ensure personal protective equipment (PPE) is well equipped on each personnel, including wearing non-slip shoes when working on offshore platforms, and manage PPE properly for the best functions. As part of the Project's Employers Requirements, it is required for all contractors to provide suitable and sufficient facilities free of charge at all sites, including toilets, facilities to adequately rest such as shaded areas, fresh drinking water, facilities to eat, wash (hot and cold water) and dry and store personal items. Where drinking water machines will be provided, the contractors are required to comply with the Regulation for Drinking Water Supply Equipment Maintenance and Management (飲用水連續供水固定設備使用及維護管理辦法). When works are not being undertaken, all equipment must be cleared away on-board the vessel and structures to prevent fouling and accidents.
Fire	<ul style="list-style-type: none"> Regularly inspect electric facilities and prohibit the accumulation of flammable materials on site. Fire extinguishers will be installed in obvious locations on site will be illuminated at night. They will be inspected regularly to ensure functionality.
Weather events	<ul style="list-style-type: none"> Pay attention to weather forecast and the notice from the authority. Cancel outdoor work when the risk of typhoon or extreme weather events has been identified. Avoid approaching to the seawalls during spring tide periods. Sea weather (such as wind conditions, sea conditions, visibility, tides), forecast and early warning mechanisms (such as lightning warnings), voyage planning (such as waterways, distances, the nearest haven on the planned route, etc.) will be considered before offshore work. When the temperature is high, adjust shifts to avoid working at noon and supply with sufficient water or drinks where suitable. When a typhoon event is identified, all machinery and structures in the onshore site area will be fixed with wires and brackets, and sufficient lighting equipment and generators will be prepared.
First aid	<ul style="list-style-type: none"> As part of the Employers Requirements, the onshore contractors will provide adequate first aid and / or medical facilities and a suitable and sufficient number of first aiders and / or medics.

Category	Mitigation Measure
	<ul style="list-style-type: none"> The offshore contractors are required to ensure that all offshore personnel have first aid training, with access to more advanced medical training, including offshore based paramedics and doctors. Medical facilities will be suitable for the environment, including offshore access to facilities of hospital standards. First aid treatment and Automated External Defibrillator (AED) is provided for all site personnel including Employer's personnel, subcontractor's personnel, and authorized visitors to the Project.
Training	<ul style="list-style-type: none"> A Key Performance Indicator (KPI) has been set to measure against the number of HSE Alerts issued on the Project, with the minimum being at least monthly. The HSE Alerts are in place to provide awareness to all personnel, including contractors, about health topics. A KPI of providing a monthly minimum of two (2) awareness sessions during the pre-construction stage and six (6) sessions during the construction phase in dual languages throughout the project has been set. A Minimum Standards and Training Procedure requiring all personnel working on the Project to be fit for work (medical) has been implemented, which is required to be renewed periodically and to be experienced and competent in their roles, including additional training for those working in the offshore environment.
Inspection	<ul style="list-style-type: none"> Construction safety managers will be assigned on site to implement daily inspection for onshore sites and maintain the inspection record. Convene safety and health meetings when applicable. The Project will be implementing an audit and inspection schedule to ensure site facilities and general onsite HSE are being maintained, including lightning protection system, fire protection systems and escape equipment.

For the workers in supply chain, the Project has developed Code of Conduct for Business Partners, which requires contractors and supplier to follow the Project's health and safety requirements as below:

- Provide personnel with the training and means required to safely do their work as agreed under the Partners' contract with the Project;
- Report to the Project, without undue delay, all significant health and safety incidents relating to conduct covered by the Partners' contract with the Project, subject to applicable law; and
- Monitor and report health and safety data in accordance with the Partner's contract with Project, subject to applicable laws and regulations.

In addition, ESG Questionnaire for Potential Contractors will be issued during the procurement process to understand the level of sophistication of each contractor with respect to its approach to ESG topics, including forced labor and child labor issues. Besides, a monthly HSE report is required for contractors. Reporting items include incidence observation, safety inductions, toolbox talks, site-specific training, and safety inspections.

5.6.4.4 Significance of residual impact

The mitigation measures, if implemented properly, will significantly reduce the likelihood and outcome of occupational health and safety impact. The systematic approach is suggested to be combined with continuous monitoring and reporting to facilitate effective risk management. The significance of residual impact is considered to be low.

5.7 Summary of Social Impact Assessment

This section summarizes the overall social impact assessment results as shown in [Table 65](#).

Table 65. Summary of Social Impact Assessment

No.	Type of Impact	Impact Description/Relevant Indicators	Impact Significance	Mitigation Measures	Source of Management Plan(s)	Monitoring Mechanism
Impact on Community Health and Safety						
1	Dust and Particulates Emissions	The construction / decommissioning activities, including onshore construction, HGV movements and exhaust emissions from offshore construction vessels, have a potential to impact on air quality and human health. As the simulations undertaken in the Project's EIA showed, the air quality within the AoI aligned with the regulatory standard in all scenarios and after considering the cumulative impacts of the nearby projects. Health impact to the local communities is anticipated to be insignificant and can be mitigated. It is recommended to monitor the air pollutants regularly to track the impact and identify relative issues early as the Project moves on.	Low	<ul style="list-style-type: none"> Mitigation measures are listed in the CHSSP, including but not limited to: <ul style="list-style-type: none"> Restricting or ceasing dust-generating activities on extremely windy or dry days, minimize deliveries of dry materials in windy weather. Minimize drop height during loading or unloading. Stockpiles and handling areas will be maintained in a condition that minimizes windblown or traffic generated dust by water sprays. All construction plant and machinery will be fitted with adequate emission control devices, maintained in good working order and there will be no excessive exhaust emissions. Vessel emissions will comply with the ozone depleting substances regulations in International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI. Conduct a 24-hour continuous monitoring on air pollutants per season during construction and keep the records. As outlined in the SEP, the proactive engagement and grievance mechanism accessible by stakeholders help to identify any potential related issues early and to achieve an appropriate solution. 	<ul style="list-style-type: none"> CHSSP EMP SEP 	<ul style="list-style-type: none"> Conduct ambient air quality monitoring quarterly, each lasting for 24 hours. The onshore sites for monitoring include one near the substation and one along the cable line.
2	Noise and Vibration	For the construction and decommissioning phases, the main sources of noise and vibration come from construction activities, including blasting and piling, and HGV movements. For operation phase, the wind turbines produce continuous frequency (20 Hz to 200 Hz) and low frequency (25 Hz to 200 Hz) noises through mechanical and aerodynamic mechanisms. The simulation results of noise and vibration undertaken in the Project's EIA showed that the impacts were deemed to be minor or negligible. The noise and vibration level are recommended to be regularly monitored to identify impacts early.	Low	<ul style="list-style-type: none"> Mitigation measures are listed in the EIA of the Project, including but not limited to: <ul style="list-style-type: none"> Properly plan construction time to prevent loud noise and strong vibration at night or early in the morning and enhance construction management. Low-noise construction machinery and vehicles will be adopted in onshore construction site and be regularly maintained to ensure their good condition and normal operation. Conduct a 24-hour continuous monitoring on ambient noise and vibration per season during construction and operation and conduct a monitoring on construction noise per month during construction. As outlined in the SEP, the proactive engagement and grievance mechanism accessible by stakeholders help to identify any potential related issues early and to achieve an appropriate solution. 	<ul style="list-style-type: none"> EMP SEP 	<ul style="list-style-type: none"> For vibration and environment noise, conduct quarterly vibration level monitoring, each lasting for 24 hours at two chosen sites near the onshore facilities. For construction noise, conduct monthly monitoring, each lasting for 2 minutes at one site within 1 meter radius from the substation.
3	Exposure to	During construction and decommissioning phases, project activities may generate communities' exposure to waterborne,	Low	<ul style="list-style-type: none"> Housekeeping and waste management will be part of the Project's Employers Requirements and be included in the topics of the lunch and learn sessions and on site HSE initiatives to lower the probability of environmental incidents leading to 	<ul style="list-style-type: none"> CHSSP SEP 	<ul style="list-style-type: none"> Undertake camp and vessel inspections of the accommodation

No.	Type of Impact	Impact Description/Relevant Indicators	Impact Significance	Mitigation Measures	Source of Management Plan(s)	Monitoring Mechanism
	Diseases	vector-borne or communicable diseases. As the earthworks undertaken during construction is expected to be limited, the creation of vector habitat is not expected to be a significant risk. However, sanitary waste generated during construction can cause problems such as flying, contaminating the ground, and emitting odor, etc. It is estimated there will be at most one hundred (100) on-site workers at the same time during construction, representing 0.11% of the total population of the district.		<ul style="list-style-type: none"> water quality and availability, infestations of insects and rodents and the spread of infectious diseases. Sanitary waste generated during construction will be collected in containers with lids. Entrust a qualified disposal agency or coordinating the local cleaning team to transport it to the waste disposal site. Being able to provide efficient response and ongoing care on the Project reduces the risk to local communities and other stakeholders, as the probability of spread of infectious diseases can be lowered. Implement the proactive engagement in the SEP and develop grievance mechanism accessible by stakeholders to identify any potential related issues early and to achieve an appropriate solution. 		<p>facilities provided in the local communities and vessel accommodation in advance of the works</p> <ul style="list-style-type: none"> Implement audit and inspections to ensure that accommodation, site facilities and general onsite HSE are being maintained.
4	Hazardous Materials and Waste	During construction and decommissioning phases, improper disposal of construction waste and mismanagement of hazardous materials can cause environmental contamination, leading to health impact. While the Project does not involve the use of hazardous chemicals in significant amounts, the maintenance of construction machinery and vehicles requires engine oil and lubricants.	Low	<ul style="list-style-type: none"> During construction, wastes such as components, tires, batteries, and solvents will be properly collected. Those cannot be recycled and reused will be disposed in accordance with the relevant regulations to prevent arbitrarily discarding and environmental contamination. Any hazardous waste to be disposed of will be managed by a licensed contractor. During the transportation of hazardous materials and waste, overloading will be prohibited, and the transported stuffs will be covered to avoid affecting the environment along the way. The engine oil, lubricants, etc. will be used at fixed locations and carefully stored in specified wastewater/oil collection buckets with lids to avoid leakage. The wastewater/oil will be handled by qualified processing contractors. Any discharge of wastewater/oil is strictly prohibited. Monitoring records in relation with the disposal of foul water, bilge water, ballast water and onshore wastewater during the construction phase will be retained for future reference. Implement the proactive engagement in the SEP and develop grievance mechanism accessible by stakeholders to identify any potential related issues early and to achieve an appropriate solution. 	<ul style="list-style-type: none"> EMP WMP (Waste Management Plan) SEP 	<ul style="list-style-type: none"> Conduct regular inspection/audit to ensure compliance with waste disposal regulations and arrangement. Review stakeholder engagement log quarterly throughout the project construction and operational phases.
5	Electromagnetic Impact	During operation phase, the onshore substation and transmission lines may create electromagnetic impact exposed to nearby households, which may affect communication equipment or cause health issues. Based on the simulation undertaken in the Project's EIA, the public exposure to electromagnetic impact within the Aol	Low	<ul style="list-style-type: none"> Implement the proactive engagement in the SEP and develop grievance mechanism accessible by stakeholders to identify any potential related issues early and to achieve an appropriate solution. 	<ul style="list-style-type: none"> SEP 	<ul style="list-style-type: none"> Review stakeholder engagement log quarterly throughout the project construction and operational phases.

No.	Type of Impact	Impact Description/Relevant Indicators	Impact Significance	Mitigation Measures	Source of Management Plan(s)	Monitoring Mechanism
		(maximum 12.46 mG) was much lower than the reference level (833 mG) suggested by MOENV. The substations and transmission lines cause very limited electromagnetic impact to the local community.				
6	Onshore Traffic Safety	Traffic congestion and unsafe conditions potential for an accident to occur may be created due to increased vehicle movements. During construction, it is expected to involve sixteen (16) one-way trips per hour for HGV / trucks transporting the back-filled soils. An estimated 100 one-way trips during peak hours for cars and scooters will occur due to commute of workers.	Low	<ul style="list-style-type: none"> A traffic management plan will be developed to implement traffic control measures such as early warning signs, site warning signs and notices, temporary speed limits, partial road closures, traffic cones, no reversing rules and demarcated routes for vehicles and pedestrians. Personnel will be assigned to maintain traffic safety. HGVs will be equipped with devices to prevent visual blind spot and to reduce the potential for an accident to arise. All personnel will be given awareness training and discuss traffic management for each shift via daily toolbox talks. 	<ul style="list-style-type: none"> EMP CHSSP SEP 	<ul style="list-style-type: none"> Conduct regular inspections/audits to assess compliance. Review stakeholder engagement log quarterly throughout the project construction and operational phases.
7	Misconduct of Security Personnel	According to the CHSSP, the onshore substation is required to have 24-hour security during construction. Although security arrangements can help prevent receptors from accessing the Project, there is the potential for issues to occur, including abuse of power and the use of inappropriate force by security personnel.	Low	<ul style="list-style-type: none"> Security personnel management in relation to hiring, rules of conduct, training, equipping and monitoring will comply with applicable regulations and guidelines. Contractors are expected to ensure that all security personnel, including contracted security personnel, respect the human rights and dignity of all people, and in case of threat, use only reasonable force, proportional to the threat. Implement the proactive engagement and grievance mechanism accessible by stakeholders to identify any potential related issues early and to achieve an appropriate solution. 	<ul style="list-style-type: none"> CHSSP Code of Conduct for Business Partners SEP 	<ul style="list-style-type: none"> Conduct regular inspections/audits to assess compliance. Review stakeholder engagement log quarterly throughout the project construction and operational phases.
8	Emergency Events	Man-made or natural disaster-induced emergency events of a project, such as unsafe structural element/components, fire, typhoon, lightning, and earthquake, can cause immediate impact on local communities, ranging from property loss, injuries to emotional stress. Based on the Project's EIA, the structural element/components are equipped with lightning protection and are designed to withstand extreme storms. While there is high striking frequency of typhoon in Taiwan, the offshore works will be suspended when the risk of typhoon or	Low	<ul style="list-style-type: none"> When a typhoon event is identified, all machinery and structures in the onshore site will be fixed with wires and brackets. When works are not being undertaken, all equipment must be cleared away on-board the vessel and structures to prevent fouling and accidents or endangerment of third-party vessels in the surrounding area. Monitor the wind farm through real-time monitoring systems, including Supervisory Control and Data Acquisition (SCADA) system and Turbine Condition Monitoring (TCM) system. Stop turbines and conduct inspections in the case of irregularities. Implement periodic inspections on lightning protection system, fire protection systems and escape equipment. Conduct maintenance work according to the requirements of the maintenance manual and schedule to prevent facility failure from increasing the possibility of accidents. 	<ul style="list-style-type: none"> ERP CHSSP 	<ul style="list-style-type: none"> Conduct regular inspections on maintenance activities of project facilities. Conduct inspections/audits to assess compliance.

No.	Type of Impact	Impact Description/Relevant Indicators	Impact Significance	Mitigation Measures	Source of Management Plan(s)	Monitoring Mechanism
		extreme weather events has been identified, and huge structural components of the Project is located offshore where is far from the sensitive receptors, making a low likelihood of causing extensive damage.		<ul style="list-style-type: none"> The Project will prepare and implement an ERP which details the roles and responsibilities of the Project team, tier levels of incidents and support available, contact details of internal and external help and support including emergency services, Government agencies, medical facilities and hotels. Emergency response training will be provided to the project team on a periodic basis to understand their roles and responsibilities. Contractors are required to ensure emergency response training and drilling onsite and onboard all vessels. The Project will provide a three (3) tier incident process (Emergency Response Team and Crisis Management Team), a telephone conference facility dedicated to emergency events, and Crisis Management Team boxes located in designated Meeting Rooms to support more serious events. 		
Socio-Economic Impact						
9	Employment	It is anticipated that the peak daily labor requirement during the construction phase of the project will be approximately 100 workers. Beyond technical roles, there will be a concerted effort to employ local labor wherever possible. In the operational phase, subject to operational conditions and availability, the project aims to engage local fishing vessels for maintenance activities. This positive impact can be measured using indicators such as local employment records, project-related procurement records, and stakeholder management logs.	Positive impact	Enhancement Measures: <ul style="list-style-type: none"> Local Employment Local Procurement Opportunities Fishermen Training and Development Programs Community Engagement and Feedback Mechanisms Partnerships with Local Educational Institutions 	<ul style="list-style-type: none"> FRI 	<ul style="list-style-type: none"> Conduct monitoring in construction and operational phases, via monitoring survey and relevant data analysis. Compare key performance indicators against baseline data to evaluate the effectiveness of mitigation measures.
10	Fisheries Livelihood	Fisheries that will be affected by the Project include gillnetting, bottom trawling, longlining and crab potting fishing activities. The primary receptor of this impact are local fishermen, and the effects can be measured using indicators such as the catch quantity and catch value. During the construction and decommissioning phases, the affected groups include all existing fishing activities over the period of 3 to 5 years.	High	<ul style="list-style-type: none"> Government Compensation and Funds <ul style="list-style-type: none"> Fishers Compensation Electrical Assistance Fund Co-Thrive Funds Compensation alternatives: Fishery Revitalization Initiatives (FRI) <ul style="list-style-type: none"> Guard vessel contracting opportunities HSE and marine training services Marine net-gain initiatives Marine tourism Career services for fishermen 	<ul style="list-style-type: none"> FLRP 	<ul style="list-style-type: none"> Conduct monitoring in construction and operational phases, via monitoring survey and relevant data analysis. Compare key performance indicators against baseline data to evaluate the

No.	Type of Impact	Impact Description/Relevant Indicators	Impact Significance	Mitigation Measures	Source of Management Plan(s)	Monitoring Mechanism
		During the operational phase, the primary impact affects trawler and gill net fisheries for a duration of 25 years.	High		• FLRP	effectiveness of mitigation measures.
11	Local Tourism	There are potential positive impacts on local tourism development during the operational phase: tourism opportunities and recreational fisheries.	Positive impact	Enhancement measures: <ul style="list-style-type: none"> • Marine Tourism • Marine net-gain initiatives 	• FLRP	<ul style="list-style-type: none"> • Conduct monitoring in construction and operational phases, via monitoring survey and relevant data analysis. • Compare key performance indicators against baseline data to evaluate the effectiveness of mitigation measures.
12	Cultural Heritage	There are no known tangible and intangible cultural heritages found within the project site. Local communities and the general public have been identified as the primary receptors of these impacts, which are anticipated to occur predominantly during the construction phase. This impact can be measured using indicators such as cultural heritage investigation plan and report, stakeholder management log.	Low	<ul style="list-style-type: none"> • For onshore cultural heritage, will any cultural relics be discovered during construction, they must be managed in accordance with the Cultural Heritage Preservation Act. • For underwater cultural heritage, before commencing marine construction activities, the Project will comply with the relevant provisions of the Underwater Cultural Heritage Preservation Act and the Regulations for Investigation and Handling of Underwater Cultural Heritage Prior to Water Area Development and Utilization. • The SEP and Grievance Mechanism also provides mitigation measures to manage cultural heritage impacts. 	<ul style="list-style-type: none"> • EMP • SEP 	<ul style="list-style-type: none"> • Develop a chance find procedure for the Project in compliance with local regulations.
13	Offshore Vessel Collision	The project area intersects with existing sea lanes used by commercial vessels navigating the Taiwan Strait. The risk of collision poses potential impacts on passengers and shipping businesses during the lifecycle of the Project. The results of independent simulation equivalent to an event interval of approximately 25.78 years.	Low	<ul style="list-style-type: none"> • During the planning stage prior to construction, information will be provided to mapping units as early as possible, in accordance with the wind farm development progress. • Throughout the construction and operational periods, for vessels drifting without power, the operational management unit will establish a mutual rapid reporting mechanism with coast guard, port authority, and disaster prevention organizations. • For powered vessels, this wind farm project will install warning facilities such as lighting in accordance with Taiwan's "Technical Specifications for the Installation of Aids to Navigation" during the construction phase. 	• EMP	<ul style="list-style-type: none"> • Conduct regular inspections and updates to ensure the reliability of warning facilities and relevant management measures.
14	Visual Landscape	Offshore wind power projects can produce a range of visual impacts affecting various receptors, including local communities,	Low	<ul style="list-style-type: none"> • The SEP and Grievance Mechanism include mitigation measures to address and manage this impact. 	• SEP	<ul style="list-style-type: none"> • Review stakeholder engagement log quarterly throughout

No.	Type of Impact	Impact Description/Relevant Indicators	Impact Significance	Mitigation Measures	Source of Management Plan(s)	Monitoring Mechanism
	pe Quality	tourists, and local tourism operators. These visual impacts typically arise from the installation of large structures of WTGs during the lifecycle of the Project. The analysis results show that, the overall environmental change at the observation points does not exceed 0.03%, indicating a minimal or negligible impact level.		<ul style="list-style-type: none"> Attention will be given to cumulative impacts, as offshore wind farm (OWF) projects collectively contribute to long-term changes in the local landscape. 		the project construction and operational phases.
Impact on Infrastructure and Services						
15	Road Service	<p>During construction, vehicle movements can cause traffic congestion and affect road accessibility. During construction, the traffic impact caused by the Project on the adjacent road system includes the commute trips of workers and HGVs transporting construction materials or filling soils. According to the estimation undertaken in the Project's EIA, generally the traffic can be maintained at the same level as the current situation, while only two (2) of the intersections are affected during evening peak hours in weekdays during construction.</p> <p>During operation, the derived traffic volume mainly comes from the commute trips of the maintenance staffs. No operators will be stationed during operation and there will be approximately 20 maintenance staffs entering the wind turbine area. According to the estimation, the traffic quality can be maintained at the same level as the status before operation.</p>	Medium	<ul style="list-style-type: none"> A traffic management plan will be developed. Applicable measures include planning alternative roads, setting up signboards, and assigning personnels to divert traffic to facilitate people's entry and exit. Use only approved access routes or the planned routes. Flexibly adjust transportation times and reduce travelling during peak hours. The road conditions along the route will be checked as often as possible during construction. The road surface of the route travelled by construction machinery and vehicles will be maintained in good condition. The body of HGVs will be clearly marked to allow the public to easily identify the construction management responsibilities. The earthwork transportation for the transmission line constructions will not exceed 8 hours per day and will avoid peak hours. Implement the proactive engagement in the SEP and develop grievance mechanism accessible by stakeholders to identify any potential related issues early and to achieve an appropriate solution. 	<ul style="list-style-type: none"> EMP CHSSP SEP 	<ul style="list-style-type: none"> Conduct frequent road service inspections and adjust the traffic management plan if necessary in the construction phase. Review stakeholder engagement log quarterly throughout the project construction and operational phases.
			Low	<ul style="list-style-type: none"> Implement the proactive engagement in the SEP and develop grievance mechanism accessible by stakeholders to identify any potential related issues early and to achieve an appropriate solution. 	<ul style="list-style-type: none"> EMP SEP 	
16	Health Service	The influx of workforce may impact on the local medical service capacity, resulting in existing services and infrastructure not being able to meet the needs/ demand of the local communities. It is estimated there	Low	<ul style="list-style-type: none"> By introducing and maintaining high standards of first aid and access to suitably qualified medical personnel, it increases the level of care and emergency response levels. 	<ul style="list-style-type: none"> ERP CHSSP SEP 	<ul style="list-style-type: none"> Undertake regular inspections to ensure constructors meet the requirements.

No.	Type of Impact	Impact Description/Relevant Indicators	Impact Significance	Mitigation Measures	Source of Management Plan(s)	Monitoring Mechanism
		will be at most one hundred (100) on-site workers at the same time during construction. It is anticipated that the Project will not have evident impact on existing supply of local medical service. During operation phase, there will be no on-site operators, so there will be no impact on local services.		<ul style="list-style-type: none"> Being able to provide efficient response and ongoing care on the Project reduces the risk to local communities and other stakeholders, as the probability of ongoing use of local medical facilities can be lowered. As part of the Employers Requirements, the onshore contractors are required to provide adequate first aid and / or medical facilities and a suitable and sufficient number of first aiders and / or medics. Implement the proactive engagement in the SEP and develop grievance mechanism accessible by stakeholders to identify any potential related issues early and to achieve an appropriate solution. 		<ul style="list-style-type: none"> Review stakeholder engagement log quarterly throughout the project construction and operational phases.
17	Waste Disposal Service	During construction , it is estimated that there will be approximately 65.9 kg sanitary waste generated by the Project per day, which is not expected to cause burden to local waste disposal service.	Low	<ul style="list-style-type: none"> The waste generated on site by workers will be collected and categorized to facilitate recycling. Implement the proactive engagement in the SEP and develop grievance mechanism accessible by stakeholders to identify any potential related issues early and to achieve an appropriate solution. 	<ul style="list-style-type: none"> EMP SEP 	<ul style="list-style-type: none"> Conduct regular inspection/audit to ensure compliance with waste disposal regulations.
		During decommissioning , there will be a large volume of waste, which can place pressure on local waste disposal service. According to the Project's EIA, it is estimated that 60% to 80% of the wind turbine and offshore substation can be recycled, while the blades are not recyclable due to the composite material.	Medium	<ul style="list-style-type: none"> Adopt the latest available and commercialized technology to renovate and then reuse, recycle or upcycle suitable materials at the time of decommissioning phase. If not applicable, such as components containing environmentally hazardous substances, the materials will be entrusted to professional handlers for removal. Implement the proactive engagement in the SEP and develop grievance mechanism accessible by stakeholders to identify any potential related issues early and to achieve an appropriate solution. 	<ul style="list-style-type: none"> EMP SEP 	<ul style="list-style-type: none"> Review stakeholder engagement log quarterly throughout the project construction and operational phases.
Impact on Labor and Working Condition						
18	Work Force	If safeguards are not in place, a range of potential impacts can arise, such as potential employment of child, forced or bonded labor. By adhering to the regulatory requirements in Taiwan, the Project can ensure the protection of workers and the safeguarding of their rights in accordance with globally recognized standards. Human trafficking is not a significant issue in Taiwan.	Low	<ul style="list-style-type: none"> The Project and its suppliers and contractors are required to take necessary steps and adopt all required measures to avoid and prevent all forms of forced, bonded or child labor and other types of human rights abuses in their operations and in labor that is sourced by the Partner via contractor agencies or labor brokers. Any person below the minimum legal hiring age limits or the mandatory age for completing schooling, whichever is higher, will not be employed. The Project is committed to protect workers under the age of 18 from work which is regarded by applicable laws and regulations as hazardous. The Project will ensure no forced labor, including prison or debt bondage labor, and no lending of money (debt slavery) or withholding of remuneration or identity papers by employers or outside recruiters. The Project will provide a grievance mechanism for all workers and inform the workers of the grievance mechanism at the time of recruitment and make it easily accessible to them. The Project will also ensure that contracted workers have 	<ul style="list-style-type: none"> ESMP SEP 	<ul style="list-style-type: none"> Conduct regular inspection/audit to ensure compliance with policies and regulations. Review stakeholder engagement log quarterly throughout the project construction and operational phases.

No.	Type of Impact	Impact Description/Relevant Indicators	Impact Significance	Mitigation Measures	Source of Management Plan(s)	Monitoring Mechanism
				access to a grievance mechanism. In cases where the third party is not able to provide a grievance mechanism the Project will extend its own grievance mechanism to serve workers engaged by the third party.		
19	Working Condition and Management of Worker Relationship	Issues may occur and have impact on workers' human rights, including being forced to take compensatory leave instead of getting overtime pay, discrimination within the workplace and in the hiring process, prevention of workers joining unions or taking part in collective bargaining, health and safety risks due to excessive working hours and insufficient breaks, inappropriate or delayed payments to workers. By adhering to the regulatory requirements in Taiwan, the Project can ensure the protection of workers and the safeguarding of their rights in accordance with globally recognized standards.	Low	<p>The Project has developed Code of Conduct for Business Partners, the Taiwan Employee Handbook, and E&S Policy which sets out its approach to manage workers. These documents cover issues such as hiring and employment, non-discrimination and equal opportunity, bullying, harassment and abuse, retrenchment, and grievance mechanism. Mitigation measures include but not limited to:</p> <ul style="list-style-type: none"> All workers are to be provided with a written contract in a language they understand, and the documented information includes their rights related to hours of work, wages, overtime, compensation, duration and benefits upon beginning the working relationship and when material changes occur. The Project is committed to payment of rates of wages and benefits in accordance with industry standards, applicable laws, and regulations and/or any applicable collective bargaining agreements. Payment must include wages, overtime (if applicable), and paid leave. Ensure that normal working hours, meal breaks, rest periods, overtime, leave, maternity and paternity leave, and compassionate leave are in accordance with industry standards, applicable laws and regulations. The Project respect workers' freedom of union association and their right to collective bargaining (to the extent that either of such are available in the country), subject to any applicable laws and regulations, which includes negotiating in good faith and not discriminating against workers who decide to affiliate with any collective bargaining association or equivalent. As part of the Project's Employers Requirements, it is required for all contractors to provide suitable and sufficient accommodation to relevant personnel free of charge at all sites, including suitable and sufficient toilets, facilities to adequately rest such as air conditioning, fresh drinking water, facilities to eat, wash (hot and cold water), store personal items and wash and dry clothing. All provisions will be legally compliant. The Project will follow a fair and transparent process when retrenchment is required to ensure that all affected workers receive notice of dismissal and severance payments as required by law and collective agreements in a timely manner. The Project will provide a grievance mechanism for all workers and inform the workers of the grievance mechanism at the time of recruitment and make it easily accessible to them. 	<ul style="list-style-type: none"> ESMP Code of Conduct for Business Partners 	<ul style="list-style-type: none"> Conduct regular inspection/audit to ensure compliance with policies and regulations. Review stakeholder engagement log quarterly throughout the project construction and operational phases.
20	Migrants Rights	The migrant workers in Taiwan might face risks such as debt burdens during the recruitment process, restricted freedom of	Medium	<ul style="list-style-type: none"> The Project will ensure no forced labor, including prison or debt bondage labor, and no lending of money (debt slavery) or withholding of remuneration or identity papers by employers or outside recruiters. 	<ul style="list-style-type: none"> ESMP Code of Conduct 	<ul style="list-style-type: none"> Conduct regular inspection/audit to ensure compliance

No.	Type of Impact	Impact Description/Relevant Indicators	Impact Significance	Mitigation Measures	Source of Management Plan(s)	Monitoring Mechanism
		movement, and the significant number of the missing migrant workers in Taiwan remains a risk to the Project.		<ul style="list-style-type: none"> The accommodation services will be provided in a manner consistent with the principles of non-discrimination and equal opportunity. Workers' accommodation arrangements will not restrict workers' freedom of movement or of association. The Project allows workers to move freely during their employment and terminate their employment subject to reasonable notice periods without incurring unreasonable or unlawful penalties. The Project and its suppliers and contractors will provide a grievance mechanism for all workers and inform the workers of the grievance mechanism at the time of recruitment and make it easily accessible to them. The Project will also ensure that contracted workers have access to a grievance mechanism. In cases where the third party is not able to provide a grievance mechanism the Project will extend its own grievance mechanism to serve workers engaged by the third party. 	for Business Partners	with policies, regulations and project guidelines. <ul style="list-style-type: none"> Review stakeholder engagement log quarterly throughout the project construction and operational phases.
21	Occupational Health and Safety	Since the Project includes both onshore and offshore works, it may be affected by natural factors such as sea conditions, weather, earthquakes, typhoons and heavy rains, which will increase the difficulty and risk of foundation excavation, wind turbine installation and other engineering work during construction. The risks of the Project have been identified for the construction, operation, and decommissioning phases, including respiratory diseases, hearing damage, ergonomic injuries, hot work, electrical work, extreme weather events, coastal flood, and accidents. The potential outcome of this impact can be catastrophic, such as injury or fatality, while the severely impacted receptors is expected limited.	Medium	Mitigation measures are outlined in EIA, CHSSP, CCRA, and HRIS of the Project, including but not limited to: <ul style="list-style-type: none"> A HSE guideline will be established which includes: 1) identification of potential hazards to works; 2) provision of preventive and protective measures; 3) training of workers; 4) documentation and reporting of occupational accidents, diseases and incidents; 5) emergency prevention, preparedness and response arrangement. The guideline will be acquainted and approachable for all personnels. Contractors are required to ensure that all activities have a suitable and sufficient RAMS. All RAMS will be reviewed by the site teams prior to commencing work to check if anything on the day has changes that impact upon the safety of the personnel. Ensure PPE is well equipped on each personnel, including wearing non-slip shoes when working on offshore platforms, and manage PPE properly for the best functions. Pay attention to weather forecast and the notice from the authority. Cancel outdoor work when the risk of typhoon or extreme weather events has been identified. Avoid approaching to the seawalls during spring tide periods. When the temperature is high, adjust shifts to avoid working at noon and supply with sufficient water or drinks where suitable. The offshore contractors are required to ensure that all offshore personnel have first aid training, with access to more advanced medical training, including offshore based paramedics and doctors. 	<ul style="list-style-type: none"> EMP CHSSP 	<ul style="list-style-type: none"> Conduct regular inspection/audit to ensure compliance with policies, regulations and project guidelines.

6. Monitoring and Review

The Project had established a monitoring and evaluation program within its Environmental and Social Management System (ESMS) to assess environmental and social performance throughout the Project lifecycle, ensuring compliance with Applicable Standards as follows.

- Taiwanese environmental legislation.
- Equator Principles (EP4) (2020).
- UN Global Compact (human rights, labour, environment and anti-corruption).
- International Labour Organisation (ILO), International Labour Standards, including Freedom of Association, Collective Bargaining Agreements, forced labour and child labour.
- International Finance Corporation (IFC) Performance Standards (PSs) on Environmental and Social Sustainability (2012); and
- World Bank Group (WBG) General Environmental, Health and Safety (EHS) Guidelines:
 - WBG General EHS Guidelines (2007).
 - WBG Industry Sector Guidelines for Wind Energy (2015); and
 - WBG Industry Sector Guidelines for Electric Power Transmission and Distribution (2007).

This program ensures compliance with Applicable Standards while serving two key objectives:

1. Ensuring adherence to commitments specified in the EIA and associated management plans
2. Enabling prompt identification and response to any unforeseen environmental and/or social impacts during both construction and operation phases.

6.1 Monitoring Program

6.1.1 Internal Monitoring

The monitoring program will assist in identifying unsound work practices and performance requiring corrective, remedial or preventative action. The results of all monitoring undertaken in terms of this ESMS (including audits) will be analyzed by the Project to facilitate improvements in work practices or site activities in order to progressively improve environmental and social performance in terms of the ESMS.

The monitoring program will be achieved through:

- Routinely monitor and audit compliance with the prescriptive and procedural terms as detailed in the management plans.
- Daily, weekly and/or monthly inspections and monitoring of all site activities by FEM1.
- Recording a monitoring schedule of all site activities in accordance with the EIA and Project requirements.
- Routine review of documents produced.
- Compilation of progress reports that track progress and indicate the effectiveness of the ESMS in addressing and implementing environmental and social requirements; and
- Monitoring of the implementation of any preventative action identified as a result of any incident, complaint or non-conformance to ensure the effectiveness of any changed procedures.

The monitoring program will be supported by:

- A process for corrective, remedial and preventative action to be followed if a complaint is made or an incident occurs, or a non-conformance is identified.
- The process for lodging grievances or complaints; and

- Internal and external audits to be conducted to evaluate compliance with relevant environmental legislation and the ESMS.

6.1.2 External Monitoring

The Project will conduct all monitoring and reporting in accordance with local regulations and the requirements outlined in the approved Environmental Impact Assessment (EIA).

In line with the EIA, an Environmental Protection Supervision Team (環境保護監督小組) will be established prior to construction to oversee biological conservation efforts and environmental monitoring.

- The team will consist of no fewer than 15 members, with at least one-third being experts and scholars.
- Representatives from community groups, residents, and fishermen must also make up at least one-third of the team.
- One week before each meeting, the appropriate location and website will be selected to announce meeting details. This will allow the public to apply for attendance or provide feedback. Relevant investigation and supervision materials will be posted on the development unit's website for public access.

If monitoring results in any given quarter exceed regulatory standards or negatively impact the environment, the cause of the abnormality will be thoroughly reviewed to determine if it is related to project construction. If it is determined that the project is the cause, the Project and its contractors must take immediate corrective actions. The effectiveness of these actions will be evaluated during the subsequent round of environmental monitoring.

An annual monitoring meeting will be held to present the monitoring results and the handling of any abnormal events from the past year to the Environmental Protection Supervision Team.

6.2 ESMS Audits

In addition to regular monitoring, periodic internal audits of the Environmental and Social Management System (ESMS) will be conducted to ensure proper implementation and maintenance. These audits will verify that operations are carried out according to planned arrangements and that management plans and controls are effective. Audits are categorized into internal and external types.

An audit schedule will be developed and reviewed annually, with amendments made as necessary to ensure an effective rolling review of the ESMS.

7. Reference

Project Related Documents

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2. Fengmiao 1 Offshore Wind Farm Environmental and Social Policy. Revision 2. Provided on 20 September 2024.
3. Fengmiao1 Offshore Wind Farm Stakeholder Engagement Plan. Provided on 14 August 2024.
4. Fengmiao 1 Offshore Wind Farm Community Health, Safety and Security Plan. Revision 0. Provided on 14 August 2024.
5. Fengmiao 1 Offshore Wind Farm Waste Management Plan. Revision 0. Provided on 20 September 2024.
6. Fengmiao I Supplementary Lenders Information Package Documentation - Climate Change Risk Assessment, by NIRAS, dated 12 July 2024.
7. Fengmiao I Supplementary Lenders Information Package Documentation - Fishery Livelihood and Restoration Plan, by NIRAS, dated 20 September 2024.
8. Fengmiao I Supplementary Lenders Information Package Documentation - Ecosystem Services Review Impact Assessment, by NIRAS, dated 28 May 2024.
9. Fengmiao I Supplementary Lenders Information Package Documentation – Scoping Report, by NIRAS, dated 26 April 2024.
10. Fengmiao Offshore Wind Farm Project in Taiwan - Human Rights Impact Screening Report (Draft), by KPMG, dated 3 September 2024.
11. Environmental Impact Assessment for Fengmiao Offshore Wind Farm, by CIP, dated 11 May 2023.
12. HSE Camp Inspection Form for Fengmiao 1 Offshore Wind Farm Project, dated 26 April 2024.
13. ESG Reporting Requirements for Contractors – Construction, Version 5, dated 14 August 2023, provided on 22 October 2024.
14. ESG Questionnaire for Potential Contractors, Version 2, dated 19 January 2024, provided on 22 October 2024.
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23. "Discussion on the development of offshore wind farms combined with marine tourism." Ocean Affairs Council, <https://www.oac.gov.tw/ch/home.jsp?id=315&parentpath=0,7,116>, July 2023.
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