

Environmental Monitoring Report of Formosa II

Construction & Operation Phase (April to June 2023)

Monitoring & Improvement Summary

Monitoring Item		Monitoring Site	Monitoring Result Summary	Measures & Effects
Bird Ecology	Offshore Bird	Wind farm and its Periphery	<ol style="list-style-type: none"> 1. Species composition: 3 families, 5 species and 8 individuals were recorded in this quarter. 2. Protected species: Osprey was recorded (1 individual). 3. Flying Altitude: 100% of recordings were below 25m. 	—
	Coastal birds	<ol style="list-style-type: none"> 1. Xihu National Wetland 2. Periphery Coast 	<ol style="list-style-type: none"> 1. 9 orders, 19 families, 43 species and 2,828 individuals were recorded. 2. Protected species: 8 protected species were recorded, including <i>Rostratula benghalensis</i> (II), <i>Elanus caeruleus</i> (II), <i>Garrulax taewanus</i> (II), <i>Sternula albifrons</i> (II), <i>Spilornis cheela</i> (II), <i>Buteo japonicus</i> (II), <i>Lonchura atricapilla</i> (III), and Brown shrike (III). 	—
	Nighttime Radar	Wind Farm located at Chunan (North Coast of Chunggang Estuary) and Houlong (Haowang Cape)	<ol style="list-style-type: none"> 1. Flying direction: The main flying direction is Northeast (45.1%), followed by North (38.7%). 	—
Fishery		3 Survey Lines in Wind Farm Area	<ol style="list-style-type: none"> 1. Fish: 16 families, 22 species and 86 individuals. <i>Pennahia pawak</i> takes the majority. 2. Fish egg: 7 families, 7 genera, and 768 eggs. <i>Decapterus maruadsi</i> was the dominant species. 3. Fish larva: 8 families and 9 genera, 42 individuals. 	—

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Underwater Noise (including Cetacean Acoustic Survey)	5 stations within wind farm area	<p>1. Whistles: This quarter: 54 whistles were recorded in HM-1; 135 whistles were recorded in HM-2; 109 whistles were recorded in HM-3; 201 whistles were recorded in HM-4; and 1,255 whistles were recorded in HM-5</p> <p>2. Clicks: This quarter: 267 clicks were recorded in HM-1; 3,407 clicks were recorded in HM-2; 1,664 clicks were recorded in HM-3; 2,272 clicks were recorded in HM-4; and 7,631 clicks were recorded in HM-5</p>	—
Marine Water Quality	10 stations within wind farm area	pH value is 8.2, water temperature is between 26.0-26.8°C, dissolved oxygen is between 6.3-6.6 mg/L, salinity is between 32.8-33.9 psu, transparency is between 19-28 cm, Coliform group is between <10-45 mg/L, Chlorophyll a is between 0.11-2.19 mg/L, BOD is between 0.8-1.0 mg/L, SS is between 2.6-3.2 mg/L, fat is between N.D.-1 mg/L.	—
Marine and Intertidal Ecology	10 stations within wind farm area	<p>1. Marine ecology: phytoplankton: 5 phylum, 86 genus, 178 species; Chlorophyll a is between 1.15-3.28 µg/L, zooplankton: 12 phylum, 32 genre; benthic organism: 7 orders, 11 families, 15 species.</p> <p>2. Intertidal ecology: Benthic organism: 18 orders, 30 families and 36 species</p>	—
Terrestrial Ecology	Terrestrial Power Transmission System (including Step-down Station, Land Cable and its Periphery)	<p>1. Plantation: 101 families, 288 genera and 397 species were recorded. 5 endemic species were recorded, including Taiwan incense cedar, Taiwan Agrimony, Water Willow, Flame Gold-rain Tree and Long-branch Bambusa all are cultivated.</p> <p>2. Mammal: 5 families, 11 species and 22 individuals of mammals were recorded. 2 order, 1 families, and 6 species of bats were recorded. No protected species were recorded.</p> <p>3. Amphibian: 5 families, 5 species and 75 individuals were recorded. No protected species were recorded.</p> <p>4. Reptile: 5 families, 9 species and 63 individuals were recorded. No protected species were recorded.</p> <p>5. Butterfly: 5 families, 12 subfamilies, 26 species and 289 individuals were recorded. No</p>	—

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		<p>protected species were recorded.</p> <p>6. Bird: 25 families, 43 species, and 858 individuals were recorded. 2 protected species, including Brown Shrike (III) and <i>Elanus caeruleus</i> (II) were recorded.</p>	
Aquatic Ecology	Planned important wetland in Zhunan	<p>1. Plantation: 14 families, 18 genera and 20 species were recorded. No rare species were recorded</p> <p>2. Fish: 6 families, 7 species and 142 individuals were recorded. No protected species were recorded.</p> <p>3. Crabs and Shrimps: 6 families, 9 species and 173 individuals were recorded. No protected species were recorded.</p> <p>4. Conch: 4 families, 4 species and 189 individuals were recorded. No protected species were recorded.</p> <p>5. Aquatic insects (including Odonata): for Odonata, 3 families, 10 species and 71 individuals were recorded; for aquatic insects, 3 orders, 6 families, and 269 individuals/m² were recorded. No protected species were recorded.</p>	—

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Cultural Heritage (Archeology Monitoring during Onshore Construction)	Excavation Area	Archeology monitoring for this project has been completed as of December 11 th , 2020. In the future, archeology monitoring will be conducted during excavation when conducted.	—
Air Quality	1 Station in Residency around Booster Station	Day average value for TSP is 38 µg/m ³ , Day average value for PM ₁₀ is 17 µg/m ³ , Day average value for PM _{2.5} is 13 µg/m ³ , Hourly max average value for SO ₂ is <0.00094 ppb, and day average value is <0.00094 ppb. Hourly max average value for NO is 11 ppb, and day average value is 5 ppb. Hourly max average value for NO ₂ is 25 ppb, and day average value is 14 ppb. Hourly max average value for CO is 0.5 ppm, and average value in 8 hours is 0.4 ppm. Hourly max average value for O ₃ is 38 ppb, and average value in 8 hours is 30 ppb. Major wind directions are West and SSW, day average wind speed is 1.3 m/s. This quarter, all monitoring items comply with air quality standards. No abnormal issue is observed.	—
Noise Vibration	1. 1 Station in Residency around Booster Station 2. 1 Station in Residency along Land Cable 3. Zhonggang Cihyu Temple	1. Noise: In all stations (residency around booster station, residency along land cable and Zhonggang Cihyu Temple), L _{day} , L _{night} and L _{midnight} are between 55.6-62.6 (A), 51.2-58.6 dB(A) and 48.9-55.9 dB(A), respectively. Value of each station/time section comply with ambient noise standards of the corresponding area. 2. Vibration: In all stations (residency around booster station, residency along land cable and Zhonggang Cihyu Temple), L _{v10 day} and L _{v10 night} are between 30.0-44.4 dB dB and 30.0-34.6 dB, respectively. Value of each station/time section comply with vibration standard according to Japanese Control Standards.	—
Construction Noise	1 Station in Booster Station Periphery (1m)	The booster station for this project acquired an use permit in March 26 th , 2021 (府商建字 No. 110046365). As there is no longer any construction activity for the booster station, personnel were sent to confirm that data for construction noise (in booster station periphery	—

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		(1m), including normal and low frequency) cannot be recorded in this quarter. The project will continue to send personnel to confirm the conditions.	
Groundwater Quality	1. Water Output Location 2. Planned Important Wetland in Zhunan	<p>1. Water Output Location: The booster station for this project acquired an use permit in March 26th, 2021 (府商建字 No. 110046365). As there is no longer any construction activity for the booster station there is also no longer any wastewater discharge. Personnel was sent to confirm that data for groundwater (water output location) cannot be recorded. The project will continue to send personnel to confirm the conditions.</p> <p>2. Planned Important Wetland in Zhunan: pH value is between 7.1-8.2; BOD is between 17.6-39.4 mg/L; COD is between 70-177 mg/L, SS is between 36.5-54 mg/L, Ammonia nitrogen is between N.D.-0.8 mg/L, ADMI is between 42-45 g/L, fat is between 0.7-8.4 mg/L, water temperature is between 25.2-31°C, NO₃-N is between 0.03-0.09, TP is between 0.05-0.173 mg/L, Dissolved oxygen is between 1.9-7.1 mg/L. This quarter, BOD has exceeded class IV water body quality standards. All other monitoring items comply to class IV water body quality standard.</p>	BOD measured in EIA and DA phases is also higher than class IV water body quality standard (referring to Protection Project of National Important Wetlands: https://wetland-tw.tcd.gov.tw/). It is inferred that the value is affected by organic pollutants in water from agriculture, water cultural, household and industry discharged into the wetland, which belongs to background value and is not caused by the construction of the Project. Monitoring will be continued to clarify the changes.
Electromagnetic Field	1. Step-up station 2. Residential houses near Kaiyuan Road	<p>1. Step-up station: (1). Electric Field: 1.804(mG) (2). Magnetic Field:0.515(V/m)</p> <p>2. Residential houses near Kaiyuan Road: (1). Electric Field: 0.115(mG) (2). Magnetic Field: 0.050(V/m)</p>	—