

Environmental Monitoring Report of Formosa II

Construction Phase (2023 January to March)

Monitoring & Improvement Summary

Monitoring Item		Monitoring Site	Monitoring Result Summary	Measures & Effects
Under construction-Bird Ecology	Offshore Bird	Wind farm and its periphery	<p>1. Species composition: 2 families, 2 species and 3 individuals were recorded in this quarter.</p> <p>2. Protected species: Osprey was recorded (1 individual).</p> <p>3. Flying Altitude: 75% of recordings were below 25m; and 25% were between 25-30 m.</p>	—
	Coastal birds	<p>1. Xihu National Wetland</p> <p>2. Periphery coast</p>	<p>1. 10 orders, 17 families, 43 species and 6,927 individuals were recorded.</p> <p>2. Protected species: 5 protected species were recorded, including Osprey (II), Black-winged kite (II), Taiwan hwamei (II), Crested goshawk (II) and Brown shrike (III).</p>	—
	Nighttime Radar	Wind farm located at Chunan (north coast of Chunggang estuary) and Houlong (Haowang Cape)	<p>1. Flying direction: The main flying direction is northeast.</p> <p>2. Activity mode: During monitoring in this quarter, the main flying direction is northeast (40.8%), followed by southwest (18.0%).</p>	—

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Under construction-Fishery	3 survey lines in wind farm area	<p>1. Fish: 16 families, 23 species and 160 individuals. <i>Scomber japonicus</i> takes the majority.</p> <p>2. Fish egg: 8 families, 9 genera, and 2,286 eggs. <i>Acanthopagrus pacificus</i> were the dominant species.</p> <p>3. Fish larva: 3 families and 3 genera, 24 individuals.</p>	—
Under construction-Underwater Noise (including cetacean acoustic survey)	2 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>	—
Under construction-Marine Water Quality	10 stations within wind farm area	pH value is 8.2, water temperature is between 20-20.8°C, dissolved oxygen is between 6.4-6.7 mg/L, salinity is between 33.6-33.9 psu, transparency is between 38-47 cm, Coliform group is between <10-50 mg/L, Chlorophyll a is between 0.36-1.26 mg/L, BOD is between 0.7-0.9 mg/L, SS is between 2.6-9.1 mg/L, fat is N.D. mg/L.	

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Under construction- Marine and intertidal ecology	10 stations within wind farm area	<ol style="list-style-type: none"> 1. Marine ecology: phytoplankton: 5 phylum, 60 genus, 106 species; Chlorophyll a is between 0.71-2.32 µg/L, zooplankton: 11 phylum, 26 genre; benthic organism: 7 orders, 11 families, 15 species. 2. Intertidal ecology: Benthic organism: 4 orders, 4 families and 4 species 	
Under construction- Terrestrial Ecology	Terrestrial power transmission system (including step-down station, land cable and its periphery)	<ol style="list-style-type: none"> 1. Plantation: 97 families, 281 genera and 383 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. 2. Mammal: 4 families, 8 species and 13 individuals of mammals were recorded. 1 order, 1 families, and 3 species of bats were recorded. No protected species were recorded. 3. Amphibian: 4 families, 4 species and 26 individuals were recorded. No protected species were recorded. 4. Reptile: 4 families, 7 species and 45 individuals were recorded. No protected species were recorded. 5. Butterfly: 5 families, 9 subfamilies, 28 species and 178 individuals were recorded. No protected species were recorded. 6. Bird: 27 families, 50 species, and 710 individuals were recorded. 1 protected species, including Brown shrike (III) was recorded. 	—

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Under construction- Intertidal Ecology	Planned important wetland in Chunan	<ol style="list-style-type: none"> 1. Plantation: 12 families, 15 genera and 16 species were recorded. No rare species were recorded. 2. Fish: 5 families, 6 species and 89 individuals were recorded. No protected species were recorded. 3. Crabs and Shrimps: 4 families, 6 species and 125 individuals were recorded. No protected species were recorded. 4. Conch: 3 families, 3 species and 153 individuals were recorded. No protected species were recorded. 5. Aquatic insects (including Odonata): for Odonata, 3 families, 8 species and 34 individuals were recorded; for aquatic insects, 3 orders, 5 families, and 156 individuals/m² were recorded. No protected species were recorded. 	—
Under construction- 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.	—
Under construction- Air Quality	1 station in residency around booster station	Day average value for TSP is 60 µg/m ³ , Day average value for PM ₁₀ is 34 µg/m ³ , Day average value for PM _{2.5} is 13 µg/m ³ , Hourly max average value for SO ₂ is 3 ppb, and day average value is 2 ppb. Hourly max average value for NO is 42 ppb, and day average value is 5 ppb. Hourly max average value for NO ₂ is 28 ppb, and day average value is 10 ppb. Hourly max average value for CO is 0.5 ppm, and average value in 8 hours is 0.3 ppm. Hourly max average value for O ₃ is 61 ppb, and average value in 8 hours is 59 ppb. Major wind direction is NNE, day average wind speed is 3.1 m/s. This quarter, all monitoring items comply with air quality standards. No abnormal issue is observed.	—

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Under construction-Noise Vibration	Noise Vibration	<ol style="list-style-type: none"> 1. 1 station in residency around booster station 2. 1 station in residency along land cable 3. Zhonggang Cihyu Temple 	<ol style="list-style-type: none"> 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 52.8-61.2 (A), 50.2-57.5 dB(A) and 48.9-61.9 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 30.0-40.1 dB dB and 30.0-33.4 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 (1m), including normal and low frequency) cannot be recorded in this quarter. The project will continue to send personnel to confirm the conditions.	—

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Under construction-Groundwater Quality	1. Water output location 2. Planned important wetland in Chunan	1. Water output location: 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 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. 2. Planned important wetland in Chunan: pH value is between 8-8.2; BOD is between 58.5-92.8 mg/L; COD is between 238-360 mg/L, SS is between 59.5-99 mg/L, Ammonia nitrogen is between 0.03-0.1 mg/L, ADMI is between 39-48 g/L, fat is between 2.2-4.7 mg/L, water temperature is between 17-19°C, NO3-N is between 0.03-0.31, TP is between 0.438-0.573 mg/L, Dissolved oxygen is between 6.4-7.5 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.	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.