

CHENYA FLOATING SOLAR PROJECT, TAIWAN NON-TECHNICAL SUMMARY

Introduction

This document sets out a Non-Technical Summary (NTS) of the environmental and social (E&S) issues and proposed management and mitigation measures for the development of the Chenya Floating Solar Project (the Project) in Taiwan.

The Project's developers are committed to full compliance with National Taiwanese requirements for environmental and social aspects of the development and to achieve international standards for the E&S performance during design, construction and operation of the Project.

These international standards include the International Finance Corporation (IFC) Performance Standards (PSs) and the applicable World Bank Group's (WBG) environmental, health and safety (EHS) Guidelines. For this Project, the applicable WBG EHS guidelines include the General EHS Guidelines (2007) and the EHS Guidelines for Transmission and Distribution (2007). This summary provides an overview of how these national and international environmental and social requirements are achieved for the Project.

Location

The Project is situated in Changhua county in the north west of Taiwan. Changhua is the most densely populated county in Taiwan with a population of 1.3 million people. Changhua is also notable because of its emphasis on renewable energy generation. With an installed capacity of 188 MW from 83 onshore wind turbines, Changhua County has the largest wind energy capacity of any county, municipality or city in Taiwan. As of 2015, there were 21 offshore wind farms located in the water offshore of the county.

The project site comprises two plots of approximately 87 and 89 hectares (Plot 1 and Plot 2, respectively) that are in Lunwei East District of the Changbing Industrial Park (refer to Plan 1 below). The site is located within an intertidal zone in the seashore of Changhua county, between two formal townships of Lukang and Xianxi. Plots 1 and 2 are submerged in seawater at high tide.

The Proponents

The proponents for the Project comprise two corporate entities set up specifically for each of the two sites involved: Chenya Power Co., Ltd (Chenya Power) and Holdgood Energy Co., Ltd (Holdgood) are the Project Companies for Plot 1 and Plot 2, respectively (Project Companies). The Project Companies are subsidiaries of Chenya Energy Co., Ltd (Chenya Energy), the Sponsor, which was acquired by Marubeni Corporation in early 2020.

Chenya Energy is also acting as Engineering, Procurement and Construction (EPC) and Operation and Maintenance (O&M) contractor for the Project.

Project Description

The various elements of the Project are detailed in Table 1 below. Collectively these make up the Project Description.

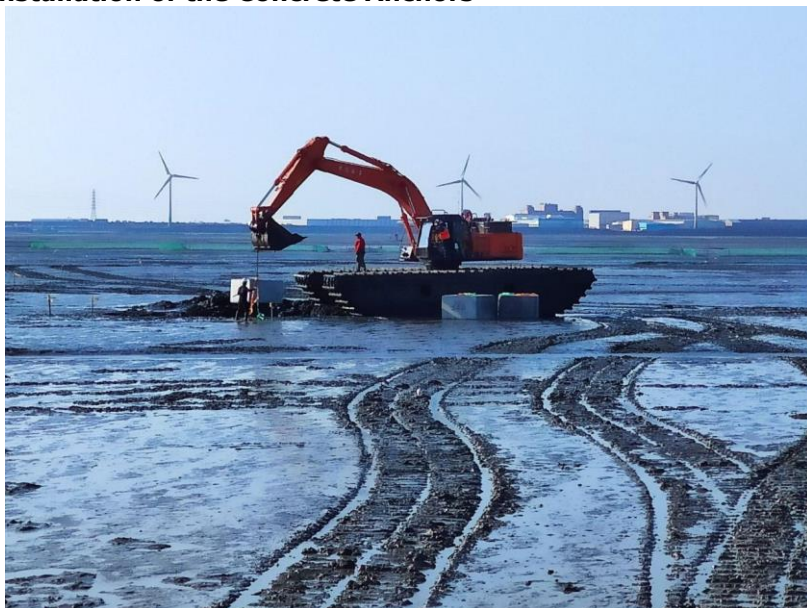
Table 1 – Project Description Key Elements

Key Element	Details	Figure Reference
Photo Voltaic (PV) Panels	Fixed to the mooring frame	Photograph 2 and Plan 2
Mooring frame and anchoring system	Includes floats, spreader bars, shackles and mooring cables	Plan 2
Concrete anchors	Buried in the seabed	Photograph 1 and Plan 2
Infrastructure Platform	A platform, comprising an elevated deck supported by concrete piles (i.e. structurally like a bridge or jetty) will be constructed within the intertidal area, to hold the associated equipment and facilities for power generation during operations.	
Substation	One new substation located to the west of Plot 1	Plan 3
Transmission lines (underground)	From the new substation to two existing TPC substations	Plan 3
Number of construction workers	200 maximum	
Produced capacity	180 MW	
Customer	Taiwan Power Company (TPC) under a Power Purchase Agreement (PPA) over 20 years	

Plan 1 – Location of the Project Site



Photograph 1 - Installation of the Concrete Anchors



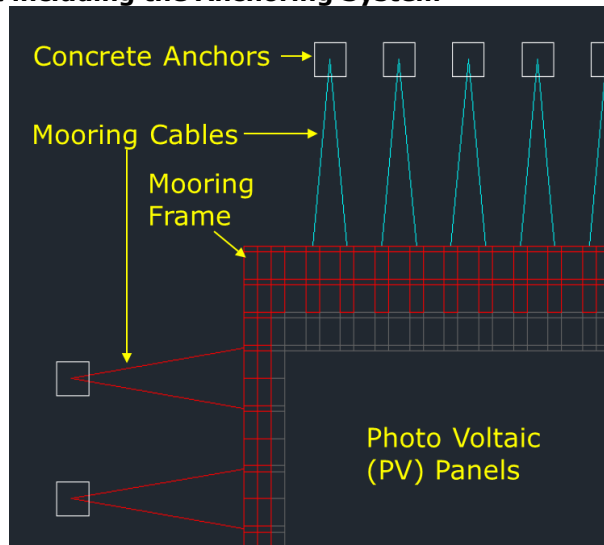
The concrete anchors are used for restraining the movement of the floats. The design of the concrete anchors takes into consideration soil conditions and is verified by regular strength checks. Based on a geotechnical investigation report prepared for the Project, the subsoils within the predicted floating solar PV area, include silty soil, fine sand and clay.

The floats are used as a platform for the PV panels and the DC cables. To provide the anchoring system the concrete anchors are buried at least 0.5 m under the seabed in both Zones. One anchor will be connected to two mooring lines as shown in Plan 2. The same float specification will be the maintenance walkway to the equipment (refer to Photograph 2 below).

Photograph 2 – PV Cells on Floating Structure



Plan 2 – Design Concept including the Anchoring System



The Project will be connected to the regional grid at the Zhangbin Extra High Voltage Substation operated by Taiwan Power Company (TPC) which is located 3 km to the northeast of the project site. The smaller substation will be located on shore, west of the floating solar PV platforms (shown in light blue on Plan 3). Transmission lines (shown in purple) will transfer the stored energy from the substation underground to existing intermediate TPC substations (shown in grey on Plan 3).

The project site is located between the seashore and an area of reclaimed land. The elevated Highway 61 is located parallel to the eastern boundary of the site. This road is considered suitable for access to the project site, particularly for the transportation of equipment during construction and operation – refer to Plan 4.

Plan 3 – Existing TPC Substations and Proposed Transmission Lines



According to the tidal observation data collected from Industrial Development Bureau (IDB), the maximum tidal height is 3.25 m and the minimum tidal height is about -2.24 m. The elevation of existing ground is about -1.5 m to 0.5 m. Therefore, the site ground will be above water level during low tide.

Project Schedule

The overall timeframe of the Project, including permitting, engineering, procurement, manufacturing, installation and testing is 25 months. The overall duration of the construction works on site (from start of works on site to grid connection), excluding preliminary works, is 16.5 months. At the time of this NTS preparation, design and engineering have been completed and the project is under construction. Construction is anticipated to be completed by the end of 2020.

Land Tenure

The Ministry of Economic Affairs has granted the proponents lease agreements for the two land plots to construct the floating solar PV cells. The Project will also require land for the construction of the substation and the transmission line to connect to existing TPC substations. These land components will be leased or purchased from the local government.

Potential social impacts for solar power plants are typically associated with land acquisition process. Given these is no private land acquisition, related social impacts are expected to be minimal.

Legislative Requirements

In Taiwan, the administration of approvals for environmental impact assessment (EIA) and related matters are under the purview of the Environmental Protection Administration (EPA). The main legislation governing Taiwan's EIA process is the EIA Act, which was promulgated on December 30, 1994. Under the screening criteria requirements as to whether a project should be required to conduct an EIA, solar PV development is not listed as an activity which requires the preparation and submission of an EIA unless it is situated within an important wetland as determined by Taiwanese legislation.

The existing Project footprint is not located within any important wetland or sensitive areas declared under Taiwanese laws. A formal EIA waiver letter from EPA has been obtained to confirm that the Project is not required to conduct an EIA as part of the development control process.

Environmental and Social Issues

Air Quality and Noise

The area around the project site is generally industrial in nature. The nearest residential receptor is 800 m to the east. The most likely air quality and noise impacts are from construction, including:

- Temporary noise impacts from excavation and piling;
- Traffic noise during construction, as trucks deliver materials to the project site; and
- Dust generation during construction.

These issues will produce a temporary impact over the 16.5 month construction period. However, communications with relevant stakeholders will be established to ensure prior notice of noisy or dusty works. An avenue for complaints/feedback will also be established and a stakeholder engagement plan developed to manage communications with stakeholders through notice procedures and the grievance mechanism. It should be noted that there will be no night-time construction activities.

Water Quality

Potential erosion and sedimentation issues can arise from the earthworks and offshore structures such as the floating solar PV panel supporting structures, anchoring system and foundations for the extended

equipment platform. As the Project connects to the open sea, any impact to surface runoff quality could affect coastal water quality. There is potential for increased turbidity; contamination from use of equipment (oils); and excavation of soils potentially releasing heavy metals.

Sound engineering and good site management practices for erosion and sedimentation control will be implemented to minimise impacts to surface runoff. These would include the use of a turbidity curtain for offshore construction activities and avoidance of works during rainy season for onshore construction activities

All materials associated with project components, such as panels and supporting structures, will be non-toxic due to the location of the project site in an intertidal area connected to the open sea.

Land and Groundwater Contamination

Given the industrial nature of the surrounding area, there could be contamination evident in the soils/groundwater at the site. Construction and operational activities will be controlled and managed to minimise the potential for leakages or spillages. Emergency response procedures will also be developed to prescribe appropriate protocols should leakages/spillages occur.

Traffic

Access to the project site is from the north via existing roads to the industrial park which are well-constructed – refer to Plan 4. Additional internal roads may have to be constructed to provide further access into the Project's substation site. Some internal roads within the industrial park would likely be required to be cordoned off for construction works

The use of local roads and bridges is likely to be more intensive during the construction period due to the transport of construction equipment and the workforce. There will be protocols developed for assessing and monitoring road and bridge conditions during construction, with provisions for rectification works if necessary. Traffic generation resulting from operational activities such as maintenance work and general operational traffic should produce minimal impact.

A traffic management plan will be developed to address any possible impacts including:

- Identification of alternative access routes, where necessary;
- A focus on liaising and communicating with the local industrial park workers who are the main existing road users;
- Restriction of construction vehicle travelling hours to avoid traffic peak periods and congestion;
- Provision of road signage and road safety marshals along roads to be used by construction vehicles; and
- Regular monitoring throughout transportation including emergency procedures.

Plan 4 – Access Route to the Project Site



Biodiversity

Numerous local and migratory bird species occur within the broader project area, of which four are nationally protected. None of these species are classified as endangered. Also, various clam species can be found along the intertidal region during low tide.

Public concerns regarding the impact of the floating solar PVs on intertidal biodiversity were raised during the stakeholder engagement meetings. Due to the uncertainties regarding biodiversity impact, local communities recommended that monitoring be carried out which would also serve as useful information for future development of similar projects.

Labour

All work and living conditions for the project are defined by local Taiwanese regulatory requirements, including standards prescribed by the Occupational Safety and Health Administration of Taiwan. The project grievance mechanism operates in the same manner for the project workforce as for broader stakeholders. Key contact information for the grievance mechanism will be provided to all workers.

Occupational Health and Safety

Occupational health and safety hazards are possible given that the site is adjacent to a coastal water body, susceptible to daily tidal level fluctuations and exposed to wave action. Risks include:

- Electrocution during installation of electrical equipment near or within the water body; and
- Drowning during construction or maintenance works near or within the water body.

An occupational health, safety and environment plan (HSE Plan) will be developed which contains emergency response procedures for the following risks:

- Typhoon (flooding);
- Work at height;
- Work in confined space;
- Use of heavy machinery; and
- Other risks, including electrocution, falling objects, land subsidence, landslides and fires.

Community Health and Safety

Community health and safety concerns associated with the Project mainly include:

- Traffic management during construction;
- Restriction of public access to foreshore areas during construction activities or live electrified plant components during operations;
- Use of non-toxic materials such as cleaning agents; and
- Temporary influx of construction workers.

A traffic management plan will be prepared for the construction phase. The land use immediately around the project site is industrial in nature so the impacts on nearby residential areas are minimal. It is noted, however, that in the stakeholder engagement meetings conducted to date, the community has raised foreshore access as a land use issue of interest. In response to this, the maintenance of a 150 m buffer has been proposed from the shoreline around the floating solar PVs so that local villagers may continue to utilise the area for vessel movement, clam harvesting and other fishing activities.

Stakeholder Engagement

The proponents are committed to including key stakeholders in the project development process. To this end, two stakeholder engagement meetings have been conducted to date. These have been undertaken in a very positive atmosphere with the result that the local community has supported the project. Chenya Energy will continue to engage the local stakeholders during the construction and operational phases.

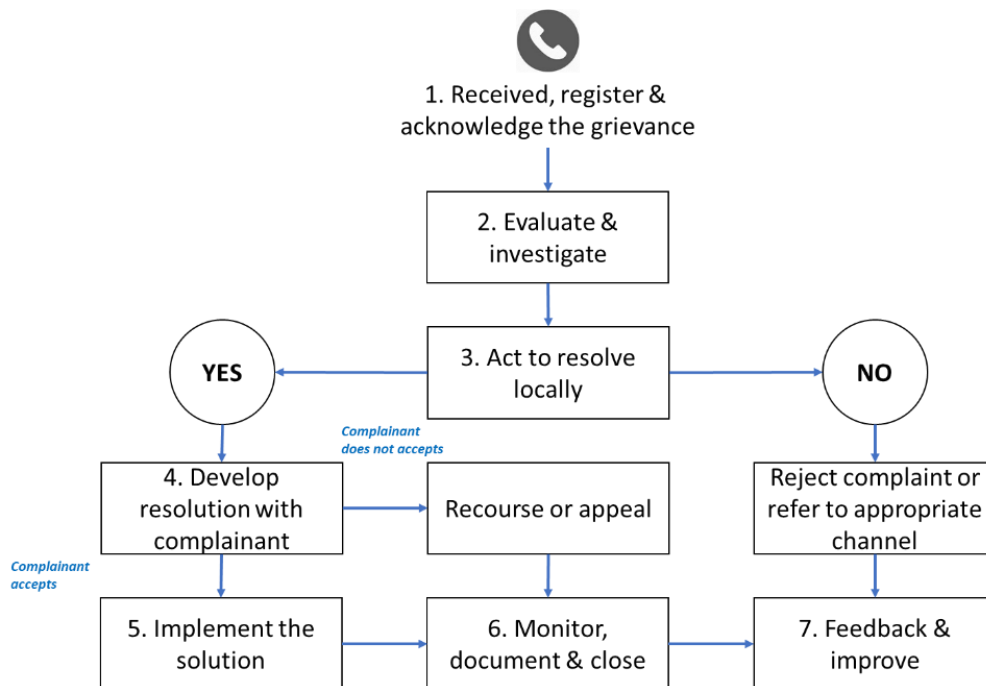
As part of the stakeholder engagement program, Chenya Energy is also developing a public recreational facility in the form of a museum to benefit the local community. Through this continuous local community presence, the proponent will provide a clear communication channel for gathering complaints/feedback and disseminating project information. These feedback/complaints will be processed in accordance with the grievance mechanism outlined below.

Grievance Mechanism

Following on from the stakeholder engagement program is a formal grievance mechanism which has been adopted by the proponents. As per international standards (namely, IFC PS1), the proponents are required to "maintain a procedure for external communications that includes methods to:

- (i) receive and register external communications from the public;
- (ii) evaluate and investigate the issues raised and determine how to address them;
- (iii) provide, track, and document responses, if any; and
- (iv) adjust the management program, as appropriate."

The grievance mechanism developed for the Project is illustrated below.



Environment & Social Policy and Management Plans

An Environment and Social Policy (E&S Policy) will be developed for the Project by Chenya Energy. The ESMP will document the broad corporate commitments made by Chenya Energy for the systemic management of the project, including goals, objectives, organizational structure, responsibilities and monitoring. The ESMP establishes the framework that supports the management plans.

A series of management plans will be developed by Chenya Energy which will be used and expanded on by their contractors for managing negative impacts and enhancing benefits related to the construction and operational phases of the Project. Management plans include:

- Environmental Monitoring;
- Emergency Procedures and Response;
- Water and Wastewater Management;
- Local Employment and Local Content;
- Stakeholder Engagement;
- Grievance Mechanism;
- Traffic Management; and
- Workers’ Accommodation.

Conclusion

The Chenya Floating Solar Project will result in an additional 180 MW of energy generated using renewable technologies for Taiwan. It will provide significant employment during construction, including jobs for many local workers. While there have been some adverse impacts identified, these are manageable using conventional techniques. These techniques will be consolidated in a series of management plans. There are several positive impacts which will be enhanced and maximised through the commitments by the proponent to open and transparent dialogue with community and other stakeholders.