EXECUTIVE SUMMARY

Environmental and Social Impact Assessment Study for the AMUNET Wind Power Plant project

500 MW in the Gulf of Suez

1. Introduction

In 2013, the Arab Republic of Egypt (through the Ministry of Electricity and Renewable Energy) developed and adopted the Integrated Sustainable Energy Strategy (ISES) 2015 – 2035, which provides an ambitious plan to increase the contribution of renewable energy to 20% of the electricity generated by the year 2020, of which 12% of wind power plants is foreseen, mostly in the Gulf of Suez (GoS).

Amunet Wind Power Co. (AWPC) (hereafter referred to as ‘the Developer’), has been selected for the development of a 500 MW Wind Power Project in the GoS (hereafter referred to as ‘the Project’).

In accordance with the Egyptian Environmental Affairs Agency’s (EEAA) requirements a project of this nature and scale requires the preparation of a comprehensive Environmental and Social Impact Assessment (ESIA) before an environmental permit is granted. This document provides a summary in non-technical language of the findings contained in the ESIA Report.

2. Project Description

The Project is located in the Red Sea Governorate of Egypt, around 200 km to the southeast of the capital city of Cairo. More specifically, the Project is located within the Ras Ghareb Local Governmental Unit where the closest villages include Ras Ghareb (located 9 km to the southeast).

The Project is expected to provide around 2,200 GWh of electricity per year. The Project will result in crucial positive environmental and economic impacts on the strategic, national, and local level. Such positive impacts underpin rationale for the Project. These include the following:

- This development allows for more sustainable development and shows the commitment of the GoE to realizing its energy strategy and meeting the set targets for renewable energy sources;
- The Project will contribute to increasing energy security. The expected electricity generation from the Project will serve the annual electricity needs of more than 800,000 local households;
- The project will produce clean energy that is expected to reduce consumption of liquid fuels and therefore reduce greenhouse gas emissions as well as air pollutant emissions. The Project will likely displace more than 1 million metric tons of CO2 annually.

Project Components

Wind turbine technology relies on harvesting the kinetic energy in wind (i.e. movement of wind) and turning it into mechanical energy which in turn is used for electricity generation. The key components of the Project include the following:

- Wind Turbines: a typical wind turbine is presented in the figure below.
Supporting infrastructure and utility elements for the Project which will include: (i) cables that will connect the turbines to an onsite substation; (ii) substation that converts the output from the turbines to a voltage that is appropriate for connection with the National Grid; (iii) offices and warehouse; and (iv) road network for ease of access of various project components throughout the site.

Project Phases

The Project will include 3 distinctive phases as discussed below. According to the current timeline, construction of the Project is anticipated to commence in November 2021 and will require approximately 30 months for construction. Therefore, operation of is anticipated to commence in May 2024 for a period of 20 years.

- Design and Construction Phase that will include: (i) preparation of design, (ii) transportation of components, (iii) site preparation activities, and (iv) installation of components.
- Operation Phase that will include the normal daily operation of the wind farm and the undertaking of maintenance activities as required.
- Decommissioning Phase that will include the dismantling of the various Project components at the end of the life time.
3. SUMMARY OF ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS & IMPACTS

The ESIA comprised environmental and social baseline studies and an assessment of impacts. Mitigation measures were identified for potential significant effects and the significance of residual effects determined. The key baseline and impact assessment findings are further discussed below.

Landscape and Visual

The Project site in general can be classified as a desert area. In terms of visual characteristics, no sensitive visual receptors were identified within the Project area and relevant radius surrounding the site. Project site is located within an industrial area where several activities are noted such as other wind farms and petroleum activities (as discussed in more details in land use section below).

Key impact from Project development is limited to operation phase from Project visibility. Visual impacts associated with wind energy projects typically concern the turbines themselves (e.g. color, height, and number of turbines) and impacts relating to their interaction with the character of the surrounding landscape and the visual receptor which might be present. Nevertheless, such impacts are considered not significant given that there are no key sensitive visual receptors within the area that could be affected.

Land Use

ESIA investigated the actual land use of the Project area through a land use survey. The only land use activities noted include operational petroleum facilities found mainly within the southern parts of the site and surrounding areas. Apart from the above, the area in general is uninhabited and vacant with no indication or evidence of any physical or economical land use activities.

Taking the above into account, there are no physical or economical displacement impacts anticipated from the Project and no key issues of concern are expected. Nevertheless, ESIA requires that coordination is established with relevant entity (such as General Petroleum Company) to agree on any specific requirements to be taken into account as part of the detailed design for existing petroleum activities.

Hydrology and Hydrogeology (Soil and Groundwater)
From a hydrological perspective, only 1 key wadi system runs within the norther parts of the Project site known as ‘Wadi Hawashiya’. From a hydrogeological perspective, the site is located within an area of moderate to low productive aquifers with insignificant surface recharge and limited sub-surface recharge.

Key impacts include potential for flood risks which could affect the Project site during the rainy season and especially during flash flood events. A preliminary flood risk assessment was undertaken which concludes that there are no flood risks due to presence of dams upstream of the Project site.

Other potential impacts are from improper housekeeping practices (such as illegal disposal of waste to land) which could contaminate and pollute soil which in turn could pollute groundwater resources. The ESIA has identified adequate mitigation measures which aim to control such impacts and ensure proper conduct, waste management and housekeeping practices are implemented.

Biodiversity

The biodiversity baseline assessment concludes that the Project site in general is barren and of low ecological significance and sensitivity and there are no sensitive habitats recorded within the Project site.

The main impacts on biodiversity are mainly from improper conduct and housekeeping practices by workers (e.g. hunting of animals) during the construction and operation phase. ESIA identified mitigation measures which aim to control such impacts and ensure proper conduct and housekeeping practices.

Birds (avi-fauna)

A baseline assessment was undertaken that included an avi-fauna survey that studied the use of the migratory and resident soaring birds of the Project site. The survey covered spring and autumn 2020 migration seasons. During spring, 21 species were recorded with a total of 154,333 individual birds, 6 of which were globally threatened. During autumn, 16 species were recorded with a total of 18,283 individual birds, 2 of which were globally threatened.

Key impacts anticipated on birds is during the operation phase and mainly related to risk of bird strikes and collisions with operating wind turbines. However, to control such impacts, an Active Turbine Management Plan (ATMP) will be implemented during the operation phase that will include:

- Avi-Fauna Monitoring and On-Demand Turbine Shutdown where during the migration seasons, daily onsite monitoring will be undertaken to shut down turbine during risky situations to migrating birds to avoid collisions; and
- Fauna Carcass Search that will demonstrate the effectiveness of mitigation measures such as turbine shut down and allow an estimation of the annual number of bird deaths caused by the turbines.

Bats

A baseline assessment was undertaken based on secondary data which concludes that the site is expected to be of low significance due to arid nature and low vegetation coverage. Key impacts anticipated on bats is during the operation phase and mainly related to risk of bat strikes and collisions with operating wind turbines. Such impacts are anticipated to insignificant due to low activity excepted.

Archaeology and Cultural Heritage
An archaeological baseline survey has been carried out for the Project site. The assessment concludes that there are no records of any sites of interests or significance within the Project area and therefore there are no impacts on surface archeological remains.

**Air Quality and Noise**

An air quality and noise baseline was undertaken that concludes that all pollutant levels are significantly lower than the maximum allowable limits. Construction activities may increase level of dust and use of machinery and equipment are expected to be a source of noise and vibration. As part of the ESIA, appropriate mitigation measures have been identified for dust suppression and noise control such as regular watering of construction areas, proper management of stockpiles, and other.

**Infrastructures and Utilities**

- **Water Resources and Utilities** – the Project will require water throughout the construction and operation phase for potable and non-potable use. Coordinate with Ras Ghareb Water Company will take place to secure water requirements for the Project, most likely through tankers.

- **Waste Utilities** – solid waste, wastewater and hazardous waste generated during the construction and operation phase will be minimal and is expected to be managed and disposed through coordination with relevant authorities for disposal of waste streams.

- **Road Networks**: Given the increasing size, weight, and length of components of the wind turbines, proper transportation and logistical solutions could be required for managing the heavy-load long-haul requirements. A Traffic and Transport Plan will be submitted before commencement of any transportation activities to ensure that process is properly and adequately managed.

- **Other infrastructure elements** are found within nearby areas of Project to include dams, telecommunication tower, gas pipeline and other. Coordination with relevant entities will be undertaken to identify any specific requirements to be considered as part of the detailed design, if required.

**Occupational Health and Safety**

During construction and operation there will be generic occupational health and safety risks to workers, such as working on construction sites, exposure electric shock hazards during maintenance activities, working at heights, etc. ESIA requires that an Occupational Health and Safety Plan (OHSP) is developed tailored to the Project’s site and activities.

**Community Health, Safety, and Security**

Key impacts are mainly related to operation phase. Wind turbines produce noise during operation. In addition, operating turbines also produce shadow flicker effects which occur when the sun passes behind the turbine and casts a shadow away from the turbine’s location. As the rotor blades rotate, shadows pass over the same point causing an effect known as ‘shadow flicker’. Both noise and shadow flicker could be a source of nuisances and disturbances. However, within the Project site and surrounding there are no sensitive receptors that could be affected by such impacts and therefore this is considered irrelevant.

**Socio-economic Conditions**
The main impact anticipated on socio-economic conditions is related to potential job opportunities for local communities during construction and operation. However, such impacts are limited taking into account the nature of activities.

Developer is committed to ensuring that priority for job opportunities are targeted for local community members to the greatest extent possible throughout construction and operation phase. At a later stage, a local recruitment procedure will be developed. The procedure will identify the number of job opportunities targeted for local communities and recruitment process will be undertaken through the Governorate’s Labor Office. Based on that, the recruitment procedure will also include a selection process that is fair, transparent and provides equal opportunities for all including females.