

DEWA Mohammed Bin Rashid Al
Maktoum Solar Park – Phase V
900MW Solar PV IPP
Dubai, UAE



Environmental and Social
Impact Assessment

**Volume 1: Non-Technical
Summary**

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1 INTRODUCTION

To ensure a sustainable supply of clean energy in the Emirate of Dubai, His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE, and Ruler of Dubai launched the Dubai Programme for Renewable Energy in January 2012 and announced the Mohammed Bin Rashid Al Maktoum Solar Park, the largest single-site solar project in the world to enhance the sustainable development of Dubai.

The Solar Park aims to have a production capacity of approximately 5,000MW upon completion by 2030, aligning with the Dubai Integrated Energy Strategy 2030, which seeks to secure a sustainable supply of energy by diversifying Dubai's energy mix and increasing the use of clean and renewable energy sources to generate electricity. It is highlighted that the solar park will have a key contribution in the UAEs obligations to the Paris Agreement (on global climate change), as a facility in reducing the carbon intensity of grid power greenhouse gas emissions.

To meet the planned production capacity of the Solar Park by 2030, DEWA awarded the right to develop the Phase V project (the Project) to a consortium of Saudi Arabia's ACWA Power and Gulf Investment Company (GIC).

Given that the Phase V Project is already covered under the existing Environmental Clearance (EPBI-170220-00226) issued by Dubai Municipality Environment Department (DM-ED) for PV and CSP projects in the solar park footprint, there is no further requirement to obtain an Environmental Clearance. As such, this ESIA will not be submitted to Dubai Municipality, but has rather been prepared for project financing due diligence purposes in line with obligations of prospective lenders, who are understood to be signatories of the Equator Principles.

Therefore, this Environmental and Social Impact Assessment (ESIA) has been prepared by 5 Capitals (on behalf of ACWA Power) to comply and align with the applicable assessment requirements of Equator Principles IV and applicable lending standards for the Project as stated in the IFC Performance Standards and applicable World Bank Group EHS Guidelines. The ESIA had aimed to incorporate applicable mitigation and management measures stated in the EIA which received the Environmental Clearance granted by DM-ED, whilst ensuring the additional needs of the lenders are met.

This document presents a 'Non-Technical Summary' of the Environmental and Social Impact Assessment (ESIA) of the proposed Project.

1.1 Objectives of the ESIA

The objectives of this ESIA concerning the Project include but are not limited to the following:

- Assessment of baseline conditions prior to development of the project site through a review of available data and conducting surveys;
- Review of compliance obligations, including applicable federal, local and international conventions, regulations and standards, as well as international lender requirements.
- Assessment of the Project's environmental & social impacts for the construction (including commissioning) and operational phases, including impact significance;
- Determination of applicable mitigation and management measures to be implemented to avoid or minimise potential impacts any comply with applicable requirements;
- Consideration of alternatives that can be used for the project leading to reduced impacts and greater social & environmental gains; and

1.2 Structure of the ESIA

The ESIA has been prepared following good practice methodologies and is based on a format developed by 5 Capitals and used on other solar projects in the region. The structure of this ESIA is presented as follows:

- **Volume 1:** Non-Technical Summary
- **Volume 2:** Main Text, Tables, Figure and Plates
- **Volume 3:** Framework for Environmental and Social Management
- **Volume 4:** Appendices

1.3 Related Project Environmental & Social Documents

It is noted that the Project's Environmental & Social documentation also includes the following, which are related, but have been prepared separately to the ESIA:

- Stakeholder Engagement Plan (SEP);
 - Including internal party and third-party Grievance Mechanism.

1.4 Key Project Information

Table 1-1 Key Project Information

PROJECT TITLE	DEWA Mohammed Bin Rashid Al Maktoum Solar Park – Phase V 900MW Solar PV IPP
PROJECT PROPONENT	Dubai Electricity and Water Authority (DEWA)
PROJECT DEVELOPER	ACWA Power
PROJECT COMPANY	Shuaa Energy 3 P.S.C
EPC CONTRACTOR	Shanghai Electric Group Co. Ltd.
OPERATION & MAINTENANCE COMPANY	The First National Operations & Maintenance Company (NOMAC)
ENVIRONMENTAL CONSULTANT	5 Capitals Environmental and Management Consulting PO Box 119899, Dubai, UAE Tel: +971 (0) 4 343 5955, Fax: +971 (0) 4 343 9366 www.5capitals.com

1.5 Project Timeline

Table 1-2 Key Project Milestones

MILESTONES	DATE
Notice to Proceed	End of July 2020
Scheduled Commercial Operation Date – 300 MW Phase A	2 April 2021
Scheduled Commercial Operation Date - 300 MW Phase B	2 April 2022
Scheduled Commercial Operation Date - 300 MW Phase C	2 April 2023

2 PROJECT OVERVIEW

2.1 Project Location

The Project will be located in the Saih al Dahal Area of Dubai, UAE, situated within the boundary of the Mohammed Bin Rashid Al Maktoum Solar Park. The Solar Park is located about 53km south of the Dubai Creek, 21km south-east of Al Maktoum International Airport (Dubai World Central: DWC) and approximately 23km away from the Dubai - Abu Dhabi border.

Figure 2-1 Proposed Project Site



Figure 2-2 Project Location within the Solar Park Boundary



2.2 Land Ownership

DEWA owns the plot of land (Affection Plan Plot ID: 9717813) located almost 45 Km south of Dubai City within the Mohammed Bin Rashid Al Maktoum Solar Park.

DEWA has granted the Project Company a Musataha interest in the allocated site which is the equivalent under UAE law of a leasehold interest, but unlike a leasehold interest, a Musataha interest is registerable in the UAE. The right also allows the Project Company to build and own the Plant on the site independent of DEWA's ownership of the land and will grant easements and rights of way over designated areas outside of the site boundaries. The complete 'Affection Plan' can be found in ESIA Volume 4, Appendix C.

2.3 Project Description Summary

The Project will be developed as an Independent Power Project (IPP) utilizing photovoltaic technology to generate electricity. The scope of the Project works will include the development, design, engineering, construction, commissioning, financing, operations and maintenance of the Phase V 900MW Solar PV Power Plant.

2.3.1 Construction

Construction will be the responsibility of the EPC Contractor, with the Project primarily being construed in three stages for the separate solar fields. All temporary construction working areas and facilities will be located within the Project footprint. It is expected that the EPC Contractor will engage several Sub-Contractors and there will be a peak workforce of approximately 1,000 workers.

2.3.2 Process and Operations

The proposed Project will utilize bifacial type Solar PV modules that generate energy from both top and rear sides. The modules will comprise PV cells arranged in arrays upon a single-axis tracking system/ mounting structures. The PV modules will be designed and arranged to ensure the most efficient alignment for the capture of solar radiation. Mounting structures will be established with shallow foundations set into the underlying soils.

The Project will also include ancillary facilities related to electrical dispatch, operations & maintenance, administration, worker welfare and security amongst others.

2.3.3 Project Associated Facilities

Access Road

The EPC Contractor will as part of the Project construct an Access Road that will then be managed by the Roads and Transport Authority (RTA). The access road will connect to an existing hardstanding road that is in place up to the DEWA Phase III Field A entrance.

Electrical Connections & Substation

The Project will connect to, and export power through the existing 400/132 kV MBR SOLAR and the under construction 400/132 kV SHAMS Substation. Both are operated by DEWA and are located in the Solar Park. The Substation operation and connection to the Transmission System will be the responsibility of the Offtaker. Interconnection between the Plant and the Offtaker Substation will be made through one 132 kV underground cable for each 100 MW and will be the responsibility of the Project.

3 OVERVIEW OF LOCAL ENVIRONMENT & SOCIAL CONTEXT

3.1 Site Surveys

The process of undertaking the ESIA included several visits to the Project site to conduct familiarisations and baseline surveys. These included:

Table 3-1 Site Visits & Surveys

PURPOSE	TEAM	DATES
Site Familiarisation	5 Capitals	April 2020
Ambient Air Quality Monitoring	5 Capitals & CORE Laboratory	April 2020
Noise Monitoring	5 Capitals	April 2020
Soil Sampling	5 Capitals & CORE Laboratory	April 2020
Terrestrial Ecology Surveys	5 Capitals	April 2020

3.2 Land and Land Use

The location of the Project site is within the Al Marmoom Conservation Area, the first unfenced nature conservation reserve in the United Arab Emirates that comprises approximately 10% of the total land area of the Emirate under Dubai Municipality management. The DEWA Mohammed Bin Rashid Al Maktoum Solar Park forms an integral part of the conservation area.

The land at and around the Project site is primarily natural habitat consisting of gravel plains with dunes that provide a slight increase in elevation. Dunal areas include locally protected Ghaf trees which tend to be located along dune ridges. A large proportion of the site, particularly in the north consists of gravel plain. A ridge of dunes is present at the extreme north of the Phase V site and across a central area, with some sand sheet to the south of this.

Besides the locally protected Ghaf trees, the Project area is known to be inhabited by several local and internationally important faunal species, including the Arabian Oryx (IUCN status - "Vulnerable").

Due to the remote location of the Solar Park, there are few human receptors in proximity to the site and no affected communities. The nearest land uses are other projects in the Solar Park, as well as the Solar Innovation Centre and Research and Development Centre. Besides Solar Park facilities and infrastructure, the Al Qudra cycling track is located nearby, as well as a handful of Ghaf tree nurseries (one approximately 70m from the eastern Project boundary), Oryx feeding stations and camel farms (the closest 2.8km from the eastern Project boundary).

4 SUMMARY OF MAIN ENVIRONMENTAL IMPACTS

4.1 Air Quality

The Project site is located in a remote desert area of Dubai away from primary pollution sources, with no known point sources of pollution locally. In addition, there are no identifiable diffuse emission sources, with limited mobile sources (i.e. from off-road vehicles in the area, or vehicles and equipment being used at the other solar park projects). This is reflected in the result obtained during Air Quality monitoring conducted in April 2020 where all measured parameter was found to be well within the Local, Federal and WHO ambient air quality standards.

As a solar PV plant there are not expected to be impacts during normal operations, although there is the possibility of temporary impacts during the construction phase, primarily related to dust generation and the gaseous emissions from temporary and mobile equipment. Due to the lack of receptors locally, such impacts are not expected to be of key significance and can be managed via good construction practices.

4.2 Noise & Vibration

The isolated nature of the Project site means that there are few existing influences due to noise, with extremely low baseline noise levels recorded during calm conditions. The only local noise sources relate to the relatively distant construction works for the Phase IV Solar Park project, as well as occasional overhead aircraft and off-road vehicles.

Temporary noise impacts will result from the construction phase and will primarily be associated with heavy plant/equipment and construction vehicle movements. Key noisy works will largely be during the earthworks phases, for processes including levelling and ground-breaking. Temporary impacts related to construction processes on the site are not expected to be discernible at identified receptors outside of the Solar Park due to distance attenuation. However, there will be temporary impacts to the local conservation areas around the boundaries of the Project, and possibly to nearby Solar Park phases, including the Phase III – Field C. Mitigation has been stated in the ESIA (Volume 2) to ensure noise (and vibration) impacts are reduced where possible.

As a solar PV project, there are not expected to be noise impacts during operations.

4.3 Terrestrial Ecology

The Project site is located in the Al Marmoom Conservation Area (within the designated Solar Park boundary) and will include land take of approximately 10.2km² of existing habitat from this

area. The ecology within the Project site (and wider area) is limited in species diversity, but does include sensitive fauna species and the federally protected Ghaf tree.

Based on the type of habitat observed at the site, elements of this could fall under the 'critical' classification. A key driver for this is the location of the Project within the Al Marmoom Conservation Area, whilst there are also endemic species (to the wider region – including KSA and Oman) that are also found here, including the locally protected and important Ghaf tree. In addition the IUCN Vulnerable (Vu) Arabian Oryx has been observed on-site and 'Vu' species are known to be in the wider area, but were not observed at the site as part of the studies.

The construction phase will result in habitat loss due to site preparation activities, a cumulative impact related to on-going development within the solar park and habitat fragmentation, due to the Solar Park location. It is required that Ghaf trees are translocated under NOC from DM Horticultural Department, with careful management and translocation of fauna (including reptiles and small mammals) from working areas prior to works. Based on the translocations and certain benefits to the wider ecology and populations in Dubai, the mitigation is justified as providing a net gain for species associated with the critical habitat (i.e. the Ghaf Trees), whilst other species not associated with the classification are expected to achieve no net loss.

Such key mitigation processes will be managed via a 'Ghaf Tree Translocation Plan' and 'Biodiversity Action Plan' (BAP) to set out how the management and monitoring of such processes will take place. These will be subject to submission to DM and possible feedback by the regulator on techniques.

The operational plant may provide elements of protection for any re-establishing reptiles (particularly small lizards who can access the site through the chain link fence line). Birds in proximity to the site are not expected to be impacted by the project directly, but may indirectly be attracted to the site under the influence of 'lake effect'. However, as there are no recorded flyways within the Project site and the Project site is largely devoid of any foraging or roosting opportunities, avian species are not expected to fly over or use the Project site as supporting habitat.

4.4 Geology, Soils, Hydrology and Groundwater

Soil samples at the site have been analysed and found to be representative of expected greenfield quality characteristics, with no specific pollutants that exceed the benchmarked quality standards.

Minor impacts to soil quality may occur during construction in the event of leaks and spills, or mismanagement of any hazardous materials or wastes (expected in very small quantities). Impacts on groundwater are not expected throughout the construction or operational phases

of the Project. All such impacts can be easily avoided and managed via the implementation of good practice working methods.

4.5 Solid and Liquid Waste Management

The EPC Contractor has advised that the cut/fill balance will be managed on-site within the working area. As such, there is not expected to be rubble waste for removal off-site. Construction of the project will likely result in large volumes of recyclable PV module packaging wastes (wooden containers, pallets, cardboard and plastic ties), and very small quantities of hazardous wastes (such as used fuel containers, spent paint cans, lubricant cans and oil cans, vehicle/plant maintenance wastes).

During operations, there will be relatively few waste streams, although defective PV panels and other maintenance wastes may be generated in small quantities on a continued basis. Other wastes will be minimal but may contain small quantities of hazardous components.

Wastewater will be collected in on-site septic tanks (construction and operations) for removal off-site by licensed contractors to licensed treatment facilities. The ESIA outlines appropriate mitigation and management measures that can be implemented to suitably manage wastes during both project phases.

4.6 Archaeology and Cultural Heritage

During the baseline research and site visits undertaken to-date, no archaeology or features of cultural value (besides nearby camel farming and species of ecological importance) have been identified within the Project footprint. No archaeological sites within or nearby the Project site have been referenced in publicly held data such as the National Council of Tourism and Antiquities website and the Proceedings of the First International Conference of Archaeology in the UAE.

However, the Project site is located less than 25km away from the Saruq Al-Hadid archaeological site in a similar undisturbed desert environment. Therefore, the possibility of finding unknown underground archaeological artefacts or remains cannot be completely ruled out. As such, the ESIA sets requirements for a 'Chance Finds Procedure' to be prepared and implemented during the construction phase of the Project.

4.7 Landscape and Visual Amenity

Besides temporary disturbance during construction, the development of the Project will include the installation of thousands of PV modules and the construction of structures for ancillary facilities. This will distort the existing undeveloped landscape character and will impact views of the characteristic sands and gravel plains. Such views will be replaced by dark

coloured, flat PV Panels occupying an expansive area. This will in part blend into the wider solar park creating an increasingly modern industrial feel to the area.

Due to the relatively low-lying design of the PV Plant, views across the wider landscape are unlikely to be significantly impacted. Given the lack of and distance to the nearest permanent human receptors, this visual change from an open, undeveloped landscape is unlikely to have any significant effects to receptors. The Project area may, however, also be visible at night due to the addition of security and lighting at the entrances and along the perimeters; although this will be managed to prevent light spill to the conservation area.

4.8 Socio-Economic

The completion of the proposed project will result in the secure provision and increased capacity of electrical energy to the population of Dubai and will reduce Dubai's dependency on fossil fuel-generated power, as well as reduce atmospheric pollution; in comparison to other power generation technologies in the current Dubai energy mix.

The primary economic impact during construction is likely to result from employment creation during this phase. As well as the direct monetary uplift to the families of those employed, money paid to workers will also stimulate the local economy via the multiplier effect, whereby money earned on the project expended locally will re-circulate within the local economy.

Although, within the UAE there is a lack of available construction workforce among the immediate local population. As a result, it's most probable that a large proportion of work on the site will be undertaken by expatriate workers. This, in turn, could result in the repatriation of wages and a reduction in the benefit back to the local economy.

The operational phase will require significantly less staff than construction. Besides management and technical operators, the majority of staff will be security teams, panel cleaners and other office-based support staff. This is expected to create some employment and training opportunities for UAE nationals and facilitate the development of local capabilities and expertise and the dissemination of skills in renewable energy.

4.9 Climate Affairs

As a renewable energy project, there is essentially a neutral operational impact on Greenhouse Gas (GHGs) emissions, as the Project will not combust fossil fuels, or otherwise reduce capacity of existing carbon sinks; under normal (non-emergency) operations. A key benefit of the Project is the resulting lowering of the carbon intensity from grid electricity produced in Dubai and progress towards the UAE's Paris Agreement obligations.

The GHG emissions avoided over the operational phase have been calculated below using 2019 UAE grid GHG emissions factor data. The table below show estimated CO_{2-eq} that will be

avoided per year rounded to nearest 1000 tonnes, compared with typical grid generation emissions.

Table 4-1 Estimated CO₂ Emissions mitigated in Tonnes per year

YEAR	RELATIVE (NET) EMISSIONS (TCO ₂ EQ/YEAR)
1	1,134,000
2	1,130,000
3	1,126,000
4	1,122,000
5	1,118,000
6	1,114,000
7	1,110,000
8	1,106,000
9	1,102,000
10	1,098,000
11	1,094,000
12	1,090,000
13	1,086,000
14	1,083,000
15	1,079,000
16	1,075,000
17	1,071,000
18	1,067,000
19	1,063,000
20	1,059,000
21	1,055,000
22	1,051,000
23	1,047,000
24	1,043,000
25	1,039,000

The construction phase will result some in GHG emissions from on-site temporary equipment and vehicle use, with minimal reduction in carbon sinks due to the small scale vegetation removal combined with the translocation of Ghaf trees.

There are not expected to be significant climate physical or climate transition risks due to the Project. This is due to geographic location, working environment and the core development of the Project as a renewable energy resource.

4.10 Community Health, Safety & Security

There are few communities or other residential receptors in the proximity of the Project, which are not considered to be in the direct Project area of influence. Given the nature of the Project, associated construction and operation activities and distance from the Project site, these receptors will not be directly affected by the Project and are therefore not considered 'Affected Communities'. Project-related activities might increase the risks associated with those who may visit publicly accessible areas close to the site, as well as road users that coincide with roads used for Project access.

If there are interactions with public the construction phase will have potential risks relating to public safety that could arise, particularly regarding the use of high-powered equipment, heavy construction plant, excavations, transportation amongst others, including fire and pollution releases. Risks to public safety will be appropriately addressed and prepared in the construction phase 'Emergency Preparedness and Response Plan' and training regarding this plan. An operational phase plan will also be prepared.

Although there are no specific communities affected by the Project or in proximity (as receptors), the location of worker accommodation may have a possible impact on community health, where integration occurs. Worker accommodation is typically high-density with local services linked to these workers and accommodation needs. As such, it is likely that workers from the project will often be in contact with other workers and occasionally (but to a far lesser extent) with the wider non-labourer populations in Dubai. Hence, there is some potential for the spread of diseases within the local community (such as COVID-19), particularly those areas close to the accommodation.

The construction phase of the Project will require site-based security at the gates and on patrol around the site to prevent non-authorised parties (including the public) from accessing the construction site. All security provisions will be guided by a security plan prepared based on a security risk assessment. Given the precedent of other projects in the solar park, armed security is not anticipated.

Processes for a third-party grievance mechanism have been established in the standalone Stakeholder Engagement Plan (SEP) for public and other stakeholder complaints.

4.11 Labour and Working Conditions

In the operation and construction phases, ACWA Power's HR Policy will provide the basis for upon which the project's HR Policy will be developed. UAE Federal Law as well as International ILO and UN conventions requirements will additionally be met regarding Labour and Working Conditions. Factors such as occupational health and safety will be managed by applicable

management systems, with applicable training, provision of safety equipment and competent staff.

Labour, Health & Safety, on-site working conditions, welfare facilities and off-site camp living conditions for all contractor and sub-contractor staff will be monitored during the construction phase of the project both internally and will also be subject to external auditing by the lender's independent engineer. The IFC and EBRD Workers Accommodation Processes and Standards will be applicable to the quality of the accommodation provided. Workers will have access to an internal grievance mechanism as set out in the SEP.

4.12 Human Rights

Since its founding in 1971, the UAE has placed a high priority on respect for human rights following international human rights standards and is committed to the continual improvement of its laws and practices, based upon the country's cultural heritage and religious values, which enshrine justice, equality and tolerance.

Under the UN Human Rights Guiding principles, the majority of Project related risks will be managed in accordance with labour and working conditions to avoid forced and child labour, whilst also non-discriminating and providing equal opportunities for employment. Such instances pose risks that are publicised in the region and will need to be managed under mitigation and management controls set out in the 'Labour and Working Conditions' Section of the ESIA.

Indigenous people (or groups) have not been identified in the Project area and as such, provisions for safeguards for such people have not been considered. Other impacts to communities will be managed as set out above and as per the 'Community, Health, Safety and Security' section of the ESIA.

4.13 Cumulative Impacts

The ESIA has assessed cumulative impacts of several environmental & social parameters where applicable. As there is on-going construction in other phases of the Solar Park and intentions to further develop more phases (although not confirmed fully yet) there is the possibility of cumulative impacts related to the following.

- Air Quality Impacts
- Noise and Vibration Impacts
- Terrestrial Ecology Impacts
- Landscape Impacts

Such impacts have been further assessed in the ESIA.

5 ENVIRONMENTAL & SOCIAL MANAGEMENT & MONITORING

Volume 3 of the ESIA provides a 'Framework for Environmental & Social Management', to guide implementation of the wider Environmental and Social Management System (ESMS) following on from the ESIA (Volume 2).

This framework has been informed by the outcomes of the ESIA and has been developed to establish structures for the management of Environmental and Social risks, impacts, opportunities and compliance associated with both the construction and operational phases of the Project. The Framework is intended to outline systematic structures and management programmes that will comprise the respective construction and operational phase Environmental and Social Management Systems (ESMS).

To implement the mitigation and management measures established in the ESIA (Volume 2), specific management programmes will be developed to incorporate these mechanisms, including the requirements of the UAE, the Emirate level regulator (Dubai Municipality) and the Project Lenders. Such documented information will be in the form of project-specific Construction Environmental and Social Management Plan (CESMP) and Operation Environmental and Social Management Plan (OESMP) (and complimentary plans/procedures); to be developed before the commencement of construction and operations respectively.

This framework has also been prepared to ensure alignment with applicable elements of the established ACWA Power corporate level Health, Safety Security and Environment (HSSE) Management System Framework, which is intended to ensure consistent and structured HSSE project management between ACWA Power projects.

It should be noted that the Project ESMS documentation will be 'living' and will need to be updated concerning changes in project circumstances, activities, environmental sensitivities and future requirements defined by respective regulatory authorities and Project Lenders.

5.1 Independent Monitoring

The project will be subject to periodic independent monitoring in accordance with the requirements of the lenders, as per Equator Principle 9. The scope of the independent audits will include the implementation of the projects ESMS and will evaluate on-site activities and documented controls and monitoring efforts, with respect to the Project's compliance obligations. These are expected to be undertaken quarterly during construction and annually during operations.

6 SIGNIFICANCE OF RESIDUAL IMPACTS

Following the implementation of the design-based and additional recommended mitigation measures as identified in the ESIA, residual impacts are assessed to be either of a minor or moderate significance.