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**Masdar**

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**Non Technical Summary**

**11 March 2022**



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<b>Client:</b>	Masdar
<b>Client Contact:</b>	Jatin Batra
<b>Report Distribution:</b>	
<b>Masdar:</b>	Jatin Batra, Maryam Rashed Al Mazrouei, Tarik Mustapha Afachtal, Carlos Ponte
<b>Wood:</b>	Vicky McLean, Duncan Milne, Paolo Pucillo, Diane Scott
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## Approval Record

	Name	Job Title	Signature
<b>Prepared by:</b>	Martina Gardoni	Environmental Engineer	SIGNED
	Diane Scott	Principal Consultant	SIGNED
<b>Reviewed by:</b>	Claudia Caracciolo	Environmental and Social Consultant	SIGNED
<b>Authorised by:</b>	Vicky McLean	Associate Director	SIGNED
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## Amendment Record

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B5	11/03/2022	Minor amendments following Lenders' comments.	Final – Lender Issue.

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7. Any technology and technical design reviews are non-exhaustive. Unless expressly agreed, no design calculations have been checked.

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## Glossary

Abbreviation	Definition
AC	Alternating Current
ADB	Asian Development Bank
a.g.l.	Above ground level
a.m.s.l.	Above mean sea level
ANAS	Azerbaijan National Academy of Sciences
AoI	Area of Influence
b.g.l	Below ground level
CBs	Circuit Breakers
CCTV	Closed-circuit television
dB	Decibel
DC	Direct Current
EBRD	European Bank for Reconstruction and Development
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESMMP	Environmental and Social Management and Monitoring Plan
ESMS	Environmental and Social Management System
EPC	Engineering, Procurement and Construction
GOC	Gobustan Operating Company
HGVs	Heavy Goods Vehicles
HR	Human Rights
IBA	Important Bird and Biodiversity Area
IFC	International Finance Corporation
IUCN	International Union for the Conservation of Nature
LRP	Livelihood Restoration Plan
MENR	Ministry of Ecology and Natural Resources
MW	Megawatt
NDC	Nationally Determined Contribution
NGO	Non-Governmental Organization
NTS	Non-Technical Summary
NSRs	Noise Sensitive Receptors
No.	Number

<b>Abbreviation</b>	<b>Definition</b>
O&G	Oil & Gas
PAH	Project Affected Household
PAP	Project Affected People
PR	Performance Requirement
PS	Performance Standard
PV	Photovoltaic
SEP	Stakeholder Engagement Plan
SOCAR	State Oil Company of Azerbaijan Republic
VP	Viewpoint
WH	World Heritage
ZTV	Zone of Theoretical Visibility



## 1 Introduction

**“Masdar Azerbaijan Energy” LLC** (the Company) is planning to construct and operate a 230 MWac Solar Photovoltaic (PV) Plant in Azerbaijan. The Project area is located 60 km south of Baku City, nearby Gobustan Mud Volcanoes, and it is part of a bilateral agreement with the government of Azerbaijan. The Project will assist in achieving Azerbaijan’s 2025 vision and beyond for the inclusion of renewable energy electricity within its generation mix.

It is the Company’s intention to acquire international funding for the development of the Project and to obtain the approval from the Local Competent Authority to permit the construction and operation of the Project. Wood was appointed by Masdar to provide Environmental and Social Impact Assessment (ESIA) services to establish the potential environmental and social impacts of the Project drawing on desk-based studies, site surveys, and specialist assessments. Wood has developed the ESIA in collaboration with its partners in Azerbaijan (the Center for Social Technologies “Synergetics” and “Sulaco”) to meet local, national, and international standards. A national Environmental Impact Assessment (EIA) was prepared by Sulaco in support of the permit application. This was approved on 10 February 2022.

The Non-Technical Summary (NTS) provides a summary in non-technical language of the findings contained in the ESIA Report. The ESIA Report contains more detailed information including a description of the need for the Project; details of the Project and the main alternatives considered; the assessment of the potential effects from the proposed development on the environment and community; and details of any required procedures to mitigate significantly adverse environmental effects. An Environmental and Social Management & Monitoring Plan (ESMMP) which describes the monitoring and mitigation requirements for the duration of the project, including responsibilities and any legal requirements, has been also provided as part of the ESIA. The Company commits to the ESMMP and measures detailed will be carried into the relevant Construction and Operational Environmental Management Plans (EMP).

A Stakeholder Engagement Plan (SEP) has been developed for the Project, which describes the planned stakeholder consultation activities and engagement process as well as a grievance mechanism to ensure that it is responsive to any concerns and complaints particularly from affected stakeholders and communities.

## 2 Project Description

### 2.1 Project Developer

The Project is being developed by Abu Dhabi Future Energy Company PJSC (“Masdar”), a renewable energy and sustainable urban development company wholly owned by Mubadala Investment Company PJSC (“Mubadala”), a global leader in renewable energy and sustainable urban development. Masdar has its headquarters in Abu Dhabi. “Masdar Azerbaijan Energy” LLC is a limited liability company established by Masdar in Azerbaijan for the implementation of the Project.

### 2.2. Project Location

The Project site is located in the east of Azerbaijan Republic, on the coastal zone of the south-eastern part of the Gobustan plain, in the south-west of the Absheron Peninsula, mainly at Garadagh administrative District of Baku (503.2 ha) and Absheron district (46.8 ha). The Project will entail the development of a 230 MWac Solar PV plant, within a fenced perimeter area of 550 ha, associated sub-station and access road. The Project site location is shown in red in Figure 2-1, corresponding to the “Area 60”, approx. 60 km south-west from the Baku city and about 8 km from the Caspian Sea coast. The closest urban areas are within Gobustan (5 km east – north-east of Area 60), Atbulag (5 km north-east) and Alyat (8 km south-east of Area 60) municipalities, administrative units of the Garadagh District.

The Project will be connected to a new 330kV Overhead Transmission Power Line (OHL) of around 55 km, running to the south-west side of the Project site towards the existing substation at Janub within Shirvan urban area, to be constructed by Azerenerji and thus financed by the Government of Azerbaijan (GoA).



**Figure 2-1: Proposed Site Location**

### 2.3 Project Components

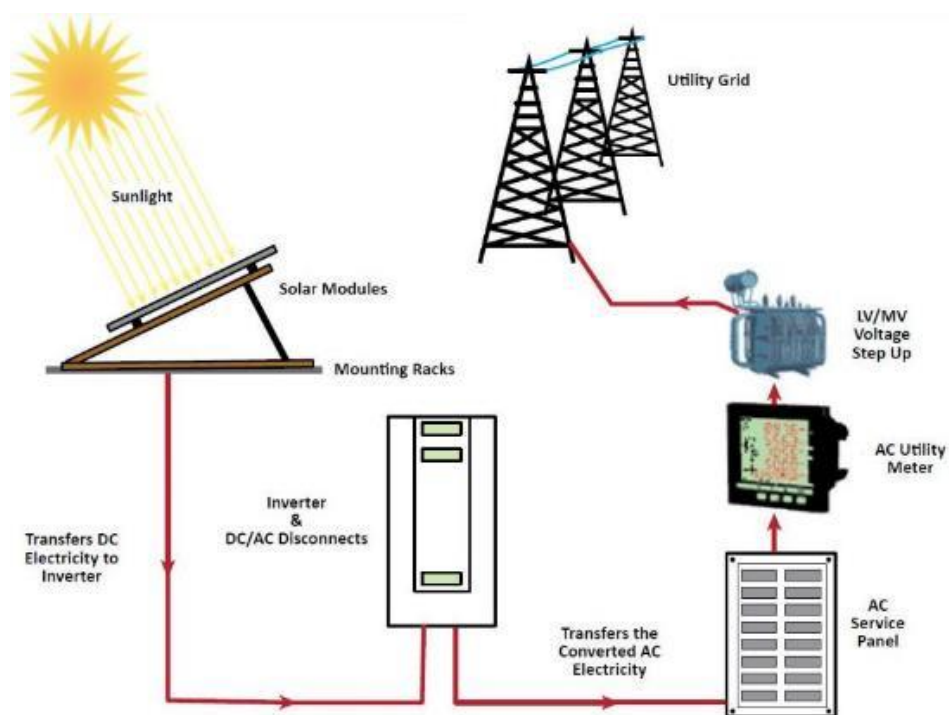
The key components of the Project are the power arrays which are composed of PV panels which convert solar energy (radiation from the sun) into direct current (DC) electricity in a silent and clean process; the total number of PV panels throughout the site will be equal to 532,112. A PV power plant contains many cells connected together in modules which are then connected in strings to produce the required output. The PV modules will be installed at the desired angle on mounting structure or racks.

Other buildings and infrastructure needed onsite include:

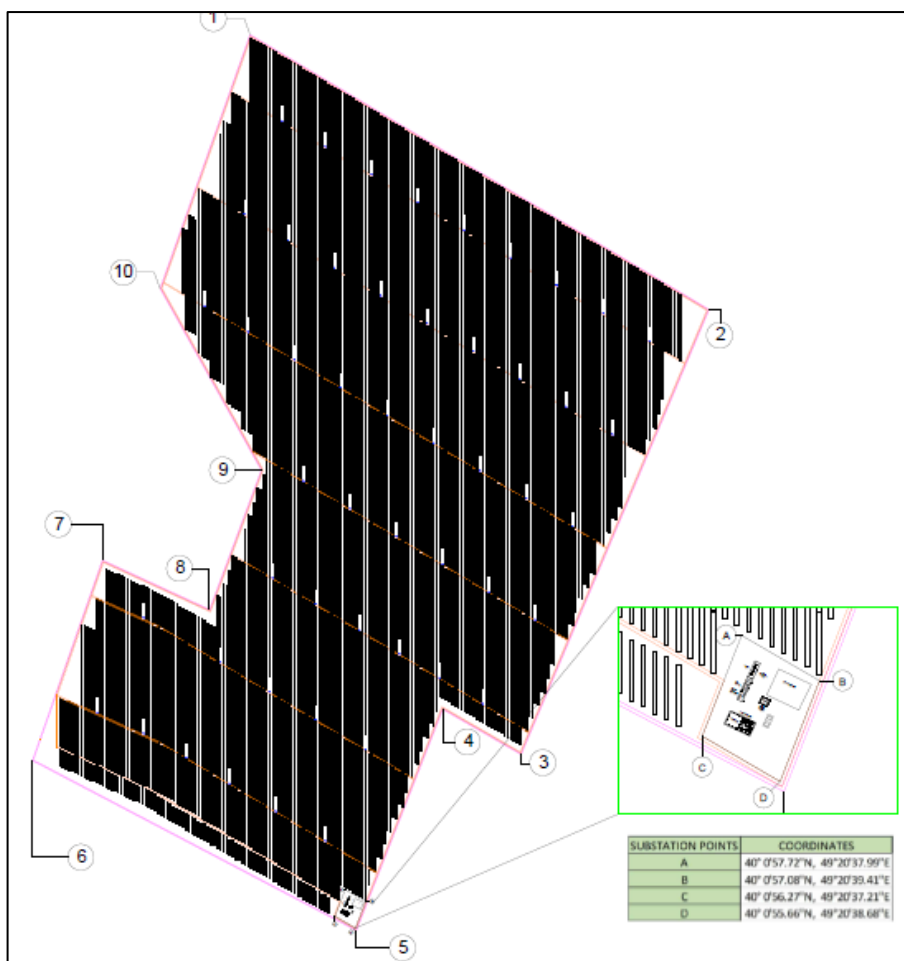
- Inverters for converting DC to alternating current (AC) electricity for connection to the utility grid and for use by the new substation.
- Step-up transformers for increasing the AC voltage to enable connection to the grid and reach the AC grid voltage level.
- Electrical substation, where the electricity is exported into the grid network. The substation will also have the required grid interface switchgear such as circuit breakers (CBs) to enable isolation and protection of the PV power plant, as well as metering equipment. The compound will likely be around 100 m x 100 m and will include space for external equipment and a substation building.

- Cabling to connect the park to the grid network and communications systems monitor and control the Project's performance, meteorological conditions, and video feeds from security cameras.
- Access road (Qobustan Access Road) for transportation of heavy equipment such as the transformers to the Project site and an internal road network between the panel arrays to facilitate access during construction and for operational maintenance.
- Additional Project infrastructure such as a scrap yard, storage area, drainage channels, perimeter fence, intrusion detection and surveillance equipment, lighting and closed-circuit television (CCTV) systems.

A representation of a typical solar PV energy park arrangement is shown in Figure 2-2, while the proposed PV Plant layout is represented in Figure 2-3.



**Figure 2-2: Typical solar PV energy park arrangement**



**Figure 2-3: Layout of PV modules, internal roads, main gate and IPP substation.**

## 2.5 Project Phases

- Pre-construction and Construction Phase (duration of up to 18 months): this phase includes preparation of a detailed design for the Project, manufacturing-procurement and transportation of the various Project components to the site, onsite preparation activities for installation of the PV arrays and various other components (e.g. excavations, grading, levelling, land clearing, etc.), and construction and installation of proposed infrastructures.
- Operational Phase (PV Plant lifetime of 23 years): this phase involves operation and routine maintenance of the PV power arrays and all the various electrical equipment, including commissioning tests, inspection of routine civil engineering quality records, regular cleaning of panels, standard electrical tests for electrical components, control of equipment and access roads.

- Decommissioning Phase (to be determined): the lifetime of the PV plant is 323 years, after which the plant would either be decommissioned or upgraded (if a new license is granted). Upgrading the PV power plant shall involve increasing the power of the plant by replacing old PV modules for new ones or by adding new elements such as trackers, PV modules or transformers. Decommissioning activities include the disconnection of the various Project components (PV array, central inverter stations, etc.) for final disposal to bring the site close to its original state.

## 2.6 Project Staffing

The Project will provide up to 420 jobs during the construction phase, including technicians and low-skilled personnel; both nationals and expatriate workers are predicted to be employed. During operation, the Project will provide up to 50 jobs for a duration of 23 years, a significant percentage of which will be comprised of national people.

## 2.7 Project Alternatives

During the Project's development a number of alternatives have been identified and analysed, including project location, processes, technology and the "no project" alternative.

Masdar assessed three different locations for the potential development of the solar PV development. The proposed layout has been selected with the aim of minimising conflicts with existing roads, residential areas and on-site constraints. According to the outcomes of a site visit performed on 27 January 2020 by Masdar, major aspects such as accessibility, suitability of the soil, absence of nearby shading objects and a suitable grid connection at the selected site have been considered to be fulfilled.

In terms of technology, the conditions of the site are optimal for solar PV and unfavourable for other renewable technologies. The site does not possess sufficient wind resource and is not characterised by hydro or geothermal potential, the 'Solar PV' technology option is therefore the most suitable for the site.

The site lays at origin desert and semi-desert type of area with non irrigated and non cultivated land, where soil is hardly suitable for cultivation and other agriculture purposes.

From an environmental standpoint, a 'without project alternative' would place greater reliance on generating additional power from fossil fuel sources but also deny the local population potential employment opportunities associated with the Project. The achievement of Azerbaijan's 2025 vision and beyond for the inclusion of renewable energy electricity within its generation mix would not be supported.

### 3 Legal and Policy Framework

#### 3.1 National Renewable strategy framework

Azerbaijan does not have a dedicated, comprehensive law governing the various aspects of renewable energy development. However, the existing legal and regulatory framework for energy also consider specific provisions for the use of renewable energy.

Azerbaijan has adopted the Strategy of Development of Renewable and Alternative Energy Source in 2012-2020 and a Strategy for Renewable Energy in 2015-2030. The "State Program for Socio-Economic Development of the Regions for 2019-2023" was developed by the Ministry of Energy as a means of further enhancing achievements in the field of social and economic development of the country. This Program particularly refers to the use of alternative and renewable sources of energy and to the improvement of the low carbon production sector.

#### 3.2 Requirements of the National EIA Procedure

The President of the Azerbaijan Republic introduced a Law on Environmental Impact Assessment (EIA) in June 2018, which was approved by the Decree No.193, dated 13 July 2018. In accordance with the provisions of this Law, the EIA report shall be submitted to the representatives of the Ministry of Ecology and Natural Resources (MENR).

The EIA should be carried out based on the following principles:

- Provide an integrated environmental, social and economic assessment of the impact of the proposed activity on the environment and human health;
- Ensure the integrity, transparency and reliability of information about the environmental safety of the proposed activity;
- Preserve the ecological balance and biodiversity;
- Not to exceed the impacts of the proposed activity on the environment to acceptable standards;
- Forecast the possible environmental consequences and assessment of the level of environmental risks;

- Ensure transparency by informing the public and taking into account public opinion.

### 3.3 International Best Practice Guidelines

International lenders who are signatories to the Equator Principles (EPs) require projects that they finance to meet international standards. Beyond Azerbaijan's legal requirements, international standards and guidance has been followed including (but not limited to) lenders requirements are detailed in the following documents:

- Equator Principles 4, 2020 (new release of EP4 in July 2020 to): be implemented by EPFIs from 01 October 2020).
- Equator Principles (Version 4),
- International Finance Corporation IFC Performance Standards and guidance, on Social and Environmental Sustainability, 2012.
- European Bank for Reconstruction and Development (EBRD) Performance Requirements and guidance
- Asian Development Bank (EBRD Environmental and Social Policy, 2019.
- ADB) Safeguard Policy, Statement, 2009.
- ADB Social Protection Strategy, 2018.
- ADB Gender and Development Policy, and 1998.
- ADB Access to Information Policy, 2018.
- JICA Guidelines for Environmental and Social Considerations. 2022.

Guidelines followed include:

- World Bank Group Environmental, Health and Safety General Guidelines, 2007.
- World Bank Group Environmental, Health and Safety Guidelines for Electric Power Transmission and Distribution, 2007.
- IFC Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets, 2007.
- IFC publication: Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants, 2015.
- BirdLife International's Solar Energy Guidance.
- IFC/EBRD Workers' Accommodation: Processes and Standards, 2009.
- IFC Stakeholder Engagement - Good Practice Handbook for Companies Doing Business in Emerging Countries.



- IFC Good Practice Handbook to Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets, 2013.
- EBRD Guidance Note on Grievance Mechanism, 2012.

## 4 Environmental and Social Baseline Conditions & Impacts

### 4.1 Introduction

Environmental and social baseline studies, including site visits, have been carried out to provide the basis to assess the significance of impacts potentially arising from the Project development. The ESIA elaboration required interpretation of the significance of the impacts to provide a conclusion or recommendation to the decision-makers who will impose conditions that must be satisfied before the PV Plant can be built.

For the purpose of the assessment, a Study Area (extending further up to 10km from the Project site depending on baseline data availability for each topic) has been defined as the area that needs to be studied in the ESIA process, in order to adequately understand and characterize the baseline. The Project Area of Influence has been defined as the physical footprint of the Project and buffer of 5 km as best practice to evaluate any potential impacts for environmental and social receptors. Mitigation measures, which are included in the ESMMP, were defined for each identified potential significant effect and the significance of residual effects determined. The impact assessment followed an assessment methodology developed to reflect current best practice.

The key baseline and impact assessment findings are further discussed below.

### 4.2 Environmental and Social Baseline & Impacts

#### 4.1.1 Landscape and Visual

The landscape of the Study Area (5 km buffer around the Project site) can be generally described as anthropogenically disturbed, comprising areas of farmland (livestock grazing mostly) and scrubs (desert and steppe flora). Twelve farms and two cemeteries (Gara Atli cemetery and Khanali cemetery) were identified within the Project Area of Influence buffer of 5km around the site during the on-field survey. A World Heritage (WH) site included in the Gobustan National Park, officially "Gobustan Rock Art Cultural Landscape", is located 3 km far from the Project site in east direction, and four mud volcanos were detected in the close vicinities of the Project area.

#### 4.1.1.1 Landscape

In order to assess the compatibility of the introduction of the Project in the surrounding environment, photographic simulations of the area were created representing the conditions before and after the construction of the photovoltaic system; an example of the bird's eye view is reported in the figure below.



**Figure 4-1: View of the Project area before and after the project development**

Given the nature of planned activities, no significant adverse impacts are predicted to arise on landscape during construction, considering also that the Project will routinely apply "industry standard "good house-keeping" measures. During operation, the greatest impact on landscape would be experienced at distances lower than 1 km from the project site, due to the physical presence of the solar PV panels, associated structures, inverters, and substation. However, the identified receptors provide adequate capacity to absorb this level of impact without materially affecting the key characteristics of the landscape character. The significance of the impact is therefore **Slight** and not significant.

#### 4.1.1.2 Visual Amenity

Desk based analysis and the outcomes of the site visit identified 6 areas (viewpoints – "VP") within the 5 km study area that were subject to careful assessment. These viewpoints are intended to provide assessment of potential visibility and thus impact of the Project throughout the Study Area. Moderate visual impacts were determined for the Goturdagh mud volcano (4.5 km from the Project site) and Gobustan Rock Art Cultural Landscape (3 km from the site) due to the introduction of detracting features into the existing landscape.

The Construction EMP will include measures to reduce potential visual impacts including landscaping and planting where feasible to screen the Project as so far as possible.

## 4.1.2 Biodiversity

The biodiversity baseline assessment concludes that the Project site in general is of low ecological value. The assessment identified several flora, fauna, and avifauna species within the Project site none of which are listed as threatened under the International Union for Conservation of Nature (IUCN) or the Red Book of Azerbaijan. The Project area has been subject to past human disturbance and is not considered to be an important area for species. Surveys were carried out in July 2020 and April 2021 of the Project site footprint and up to 5 km from the Project boundary to collect data on species and habitats present, identification of any sensitive habitats and any ecosystem services present.

### 4.1.2.1 Terrestrial Habitat and Flora

The studied area belongs to the semi-desert landscape type/ecosystems of the “PA1305 - Azerbaijan Shrub Desert and Steppe” ecoregion. The habitats within the Aol are mostly formed of ephemerals (semidesert plant communities, such as bushes wormwood and saltwort species), shrubs and halophytes (characteristic of steppe flora), and open spaces with little or no vegetation; no sensitive habitats were recorded within the Project site.

No critically endangered, endangered or vulnerable flora species were found to be present within the Project area. Furthermore, none of the species were identified as range restricted.

The impact magnitude is Low to Moderate for terrestrial habitat and flora species during construction activities, as areas of shrubs and steppes that will be affected permanently and temporarily will be limited and the overall integrity of the habitats is anticipated to remain. The areas directly affected by the Project are relatively small during operation and therefore the significance of impacts is estimated to be **Not Significant**.

Potential invasive flora species will be identified, and action taken to clear these species if they occur in or around areas designated for bush clearance to prevent establishment after clearing.

Cleared areas no longer required for construction activities will be rehabilitated by reseeding with locally found grasses (where appropriate) and shrubs to increase soil stability.

Mitigation will be included within the Construction EMP and relevant plans such as the Traffic and Transportation Management Plan to reduce the potential for significant impacts on habitats and flora.

#### 4.1.2.2 Terrestrial Fauna

Common mammals include jackals and wolves, which follow flocks of sheep to their wintering areas, and the red fox, which is one of the permanent inhabitants of the Study Area. Other typical mammals might be house mouse specie, bats, weasels, polecats, and badgers, while reptiles are mainly represented by snakes and lizards.

No critically endangered, endangered or vulnerable fauna species were found to be present within the Project area. Furthermore, none of the species were identified as range restricted.

Due to the nature of the proposed construction works, there are unlikely to be significant impacts on the terrestrial fauna populations as a whole, as their diversity within the proposed Project site resulted to be particularly low and construction activities will be temporary and limited to the Project Site. The significance of impact is therefore predicted to be **Minor to Moderate**, as alternative habitats for terrestrial fauna are present outside the Aol.

Mammals, amphibians and reptiles are likely to be affected by operation through habitat loss/degradation (potentially occurred during the construction phase), increased disturbance, and injury or mortality due to potential conflicts between workers and fauna. However, the increased disturbance due to presence of people, artificial lighting, noise and dust will be relatively insignificant during operation compared to the construction phase, with vehicle movements reduced. The significance of impacts during operation is therefore anticipated to be **Minor**.

A pre-construction survey will be completed to check for animals (reptiles and, active bird nests) and, if and re-check for plant species of conservation concern). If found, construction activities are will be programmed to avoid such features until they moved or there is a natural cessation of breeding effort.

Fencing around the Project site will be designed to allow small mammals and fauna to pass safely underneath the area during operations.

Mitigation as set out in the ESIA will be included and further developed within the Construction EMP and relevant plans such as the Traffic and Transportation Management Plan to reduce the potential for significant impacts on fauna.

#### 4.1.2.3 Avifauna

The occurrence level of avifauna in the Study Area is high, mainly due to the importance that this zone has as migratory route and flyway, as well as to the presence of the IBAs located in the vicinity of the Project Aol. Of the 236 bird species potentially present or passing through the Study Area, 79% are migratory, 43% are congregatory, and 6% are threatened at global level according to IUCN standards. None of the birds are seen to use the Project site to any significant extent.

The Project site does not include critical nesting/breeding grounds for threatened avifauna species and Project construction phase will be temporary. Construction activities are unlikely to lead to a net loss or reduction in the global or national/regional population of any species and it is likely that any potential impact on these species would be tolerated by the local population. Thus, the overall impact significance due to potential habitat loss during construction would be Minor to Moderate.

No impacts in terms of population decline are predicted as a result of collision, displacement or barrier effect during PV Plant operation. The potential negative impacts on avifauna species associated with PV panels glare and resembling water bodies are considered to be of **Minor to Moderate** significance.

Overhead line markers are proposed at the line sections closest to the Project site and will be discussed with Azerenergi. These would have an earth wire with 1 lit diverter at every 10m and marking conductors with a 1 lit diverter at 15 m in a staggered way, such that the OHL as a whole has at least one diverter every 5 to 6 m (Wildlife Institute of India 2018 Power-Line Mitigation Measures. Second edition (2020).

Any potential bird collisions with the solar panels will be monitored and noted. TheA bird protection plan will be produced that will provide the protocol for monitoring (which will be standardised, to best international practice and appropriate for detailed analysis of data) will be adaptive so that it can react to changes in noted collisions.

Avifauna-related commitments and mitigation and management actions will be captured in the Construction Environmental Management Plan (CEMP) and Operational EMP (OEMP) as applicable.

#### 4.1.3 Hydrogeology and Geology

The Project area is characterized by lack of surface waters, scarceness of atmospheric precipitations, high evaporability, semiarid type of soils, low permeability of water-containing deposits, and dominance of clay deposits in geological profiles.

#### 4.1.3.1 Hydrology and hydrogeology

Surface water is present only in areas to the north of the site (ephemeral watercourses) and for very limited periods. Even if the project will introduce impermeable surfaces to the site area, increasing run off, and risk of flooding, impacts relating to flood and drainage characteristics are considered negligible as no perennial surface water bodies are present.

The nearest state water intake which belongs to Azersu (utility company) is around 11 km away from the site. Discussions are underway with the utility company and an official application is in progress. It has been confirmed with Azersu that there would be no issues supplying the amount of water required for the Project. Water would be delivered via tankers to the Project site. To reduce flood risk, surface water will be controlled with appropriate drainage and bunded areas as appropriate.

#### 4.1.3.2 Groundwater

Considering that the water table is located at a depth greater than 10 m below ground level and that construction activities will only affect the shallow soil, the significance of potential impacts on groundwater is **negligible**. The potential sources of pollution to groundwater during operation are mainly related to leaks and spills due to maintenance activities; thus, the operation activities will not have a direct impact on groundwater.

Mitigation is proposed to reduce the risk of pollution through leaks and spills within the ESIA and this will be further developed within the Hazardous Materials and Waste Management Plan and Emergency Preparedness and Response Plan developed prior to construction.

#### 4.1.3.3 Soil and Geology

There is the potential for soils to be contaminated by chemical spills or oil leaks from machinery, as well as incorrect disposal of waste, including accidental discharge of sanitary or other wastewaters to the local environment, and potential for impacts related to vehicle traffic. However, if best practices are applied and designated roads are kept to, impacts will be of **Minor** significance in terms of soil erosion and loss of soil resource.

In terms of risks of volcanic eruption, due to the rugged terrain (the presence of deep ravines, hills, depressions, etc.) and the slope of the terrain in a southern direction in the Project area, impacts are considered **Minor** since the eruption materials cannot reach the Project site.

Mitigation to reduce potential impacts are set out in the ESIA and will be further developed within the Hazardous Materials and Waste Management Plan and Emergency Preparedness and Response Plan developed prior to construction.

In relation to seismic hazards, both temporary and permanent buildings will comply with foreseeable climatic and seismic loads at the Project sites in accordance with National legislation / building standards. This will be considered at the detailed design stage on appointment of the EPC Contractor.

#### 4.1.4 Archaeology

Within the Study Area, the only recognized heritage resource protected by the State is the "Gobustan State Historical and Artistic Reserve". During the site walkover, no direct or indirect evidence indicating the presence of an ancient settlement (i.e. cultural layer, remains of ancient settlements, household utensils, etc.) were detected within the Project site boundary. The Project site area itself and surroundings are used by farmers and herders who have farms within 5 km to the Project site. Two cemeteries have been identified in the vicinity of the Project area during the surveys conducted onsite.

Based on the feedback received from the Institute of Archaeology and Ethnography by the Azerbaijan National Academy of Sciences (ANAS) during stakeholder engagement activities performed in April 2021, the area is historically important from an archaeological point of view and the risk of findings within the Project Area cannot be totally excluded. The potential presence of burial mounds (ancient tomb monuments) in the Study Area was also noted by the Ministry of Culture.

There is the potential for disturbance to local cultural heritage aspects and intangible assets (touristic values, herders or local farmers engaged in traditional livestock, funeral practices, living traditions & religious practices); as such, the potential impact on cultural heritage assets is considered **Moderate** during construction.

During operation, the visual impact of the Project may pose risk to the historical archaeological landscape of Gobustan region. The Project is therefore considered to have a **Slight** indirect impact on cultural setting thus not significant, since initial changes are followed by rapid habituation which reduces the nuisance level. The Project provides clean energy and is considered a great opportunity for the country.

Mitigation during construction will include the implementation of a chance finds procedure to prevent potential harm to any undiscovered archaeological finds that may be present within the Project area.

#### 4.1.5 Noise and Vibration

Based on the outcomes of the site surveys performed in July 2020 and April 2021 and desk-based assessment, Noise Sensitive Receptors (NSRs - places where human receptors / users might be affected by noise generation by Project activities) have been selected within the established Project Aol of 5 km. Farms are the nearest NSRs located up to 3.5 km from Project boundaries, the closest of which is located approximately 300 m east of the Project area.

The Project construction/decommissioning phases will result in short-term noise impacts from construction activities and vehicles traffic. The Project will meet national/international noise limits (daytime) set for residential area; however, ground preparation works have the potential to result in increased noise levels at 300 m distance with an exceedance 13.9 dB over the national limits (residential area). National limits are met at a distance of 800 m from the sound source. It should be considered however that ground preparation works are considered to be short term, temporary and intermittent in nature; the noise impact due to construction works at site on nearest sensitive receptors is therefore considered to be of moderate significance.

There is a small amount of worker accommodation potentially required on the Project site (for housing up to 30 people). The location of this accommodation is not known at present and so the results of this noise assessment will assist in informing the location away from noisy areas of the Project site during construction.

The potential for significant noise impacts to arise from the construction vehicles and Qobustan access road upgrade activities are considered to be **Negligible**.

The solar PV panels will be silent in operation, noise emissions stem from the inverter units, transformers and the substation building, which is the dominant source of noise. Considering that the distance between the substation and the nearest receptor (farming area) is approximately 1 km, it is concluded that national/international daytime and night-time limits will be met at all NSRs. As such, the potential noise impact during operation will be of **Negligible** significance.



All machinery and equipment used for the Project will be regularly maintained and a Traffic and Transportation Management Plan in place to regulate traffic including speeds and machinery use. This will reduce the impact of noise and vibrations during construction. Mitigation at present is not considered necessary during operations however suggested options are included in the ESIA if additional measures are required. A grievance mechanism will be in place throughout construction and operation to monitor any noise-related complaints.

#### 4.1.6 Transportation

The route assessment has been largely based on existing maps, satellite imagery, and information gathered during the site visits. Access to the Project site will be gained via M2 Highway until Gobustan settlement, then through Qobustan Access Road, a dual carriage asphalt road of approx. 3 km length from the Gobustan settlement to the entrance of the Gobustan Reserve, and finally through a local dirt road of approx. 7 km length, running from the entrance of Gobustan Reserve to the Project site. The equipment transportation over the Project area will be provided through a network of internal roads.

The existing roads in the vicinity of the Project site are not wholly suitable for vehicles carrying construction and plant material, therefore, Qobustan Access Road will be subject to upgrading works. Damage to road edges and general 'wear and tear' of the road due to the increase generated in Heavy Goods Vehicles (HGVs) movements cannot however be excluded during construction period; impacts prior to mitigation could be **Significant**.

The addition of construction vehicles to the roads will result in a **Minor** increase in the risk of traffic accidents on both local access road and highway.

The number of vehicles during operation is likely to be very low, with access required only for maintenance and servicing. The majority of these will be light vehicles and, at the worst case, an HGV trip may be required to transport a replacement transformer to site. The effects of traffic movements stemming from the operational phase are therefore considered **Negligible**.

Generally, the overall impact is predicted to be **Moderate** with regards to Qobustan road and **Negligible** for the M2 Highway.

Mitigation is proposed within the ESIA to reduce any potential impacts, and these will be taken forward into the Traffic and Transportation Management Plan prepared prior to construction.

#### 4.1.7 Socio-Economic Context

Information concerning the socio-economic context has been gathered from a combination of desk-based sources (i.e., census, statistics, documents and other publicly available secondary sources) and on-site visits as far as possible given current COVID-19 restrictions in place in country, stakeholders' interviews and consultation.

##### 4.1.7.1 Land Acquisition and Economic Displacement

The Project has been located away from individual houses and local settlements and therefore there will be no requirement for a physical resettlement. However, the Project area is currently used by a number of farmers and herders for grazing and winter pastures and as such there may be a negative impact on the ability of local people to maintain the same level of income and access to the area.

According to the results of Within a 5 km distance from the outer boundary of the Project Area, there are 16 farmers using land informally in the regional area. Five of the farmers do not use the Project land and therefore there is a total of 11 farmers who graze their animals in the area (identified through stakeholder engagement with local farmers and government representatives, there are a total of 16 farmers who have farms located within 5 km of the Project Area.). Out of the 16 farmers within 5 km from the Project Area, there 11, four have written agreements, none of which are 7 farmers who use the land legally valid. The Ministry of Agriculture does not have the authorization to issue lease agreements to farmers as the land has historically (and still is) classified as being for industrial usage only. The only entity that has decision making power over this land is Ministry of Energy, and all documents given by other entities are invalid.

Land within the Project Area through agreement with one of the farmers, who has a written agreement as described above. He informally (through verbal agreements) sub-leases his grazing land to 7 is used as winter pasture from October to April, although sometimes the dates of arrival and departure from individual farmers. This reflects a total of 11 farmer Project Affected Households (PAHs) being present. Within 5 km distance of the Project Area, there are a further 5 farmers who do not use land within the Project Area at all and these households will not be impacted. and herders does vary and this depends upon the prevailing weather conditions.

Overall, the Project will impact 25 Project Affected Households (PAHs) and 108 Project Affected People (PAPs) which includes 65 vulnerable PAHsPAPs.

This impact will commence at the start of construction as working areas are fenced off to prevent unauthorised entry inside the site boundary.

The Project land will be restricted, and local herders will be unable to access the land; thus, the impact significance is considered to be **Moderate**.

To address this, a Livelihood Restoration Plan (LRP) commensurate with the level of impacts expected has been developed and details compensation measures for affected farmers and herders.

A Community Development Plan will also be produced that aims to provide a range of benefits to people in local communities in the vicinity of the Project, and to off-set residual impacts associated with land use change and land access restrictions.

Access to the Project site will continue to be restricted during the operation phase although the LRP shall be designed to address the impacts associated with land access restrictions from both the construction and operational stage of the Project.

During operation, the Project impacts would be limited through implementation of the measures identified for the construction period; and therefore the impact significance will be **Minor**.

#### 4.1.7.2 Employment Opportunities and Procurement of Goods and Services

Unemployment and financial problems affecting the local economy are mainly due to the lack of expertise and vocational training courses, the inability in using modern professional technologies, and the expensive tariffs for making energy careers.

The individuals employed, especially during construction, and their household members, will benefit from increased income. However, so that local people can benefit from these new job opportunities – especially long-term operations jobs – investments in training will be required. The Project represents an opportunity for young people to increase their skills through vocational training that will be of use to them after their involvement in this Project is completed. Individuals who receive such training should be able to seek alternative work within the construction sector in the future. Vocational training is likely to include training on electrical installation, ground civil works, basic HSE and site safety, and other topics.

The Project will have direct positive impacts on employment in the area. Local job creation will potentially also lead to indirect employment creation, especially in the service sectors within the district up to regional level. Also, local procurement of goods and service especially during construction will take place where possible. Given the receptors sensitivity, the impact (positive) significance is **Moderate** during construction and **Minor to Negligible** during operation.

A Labour and Working Conditions Management Plan will be developed to manage the employment process and procedures. Expectations associated with local employment will be provided via engagement with communities in line with the Stakeholder Engagement Plan.

Equal opportunities will be provided to both genders, and therefore the risk of tensions rising in households over differences in opinion will therefore be reduced. A Gender Management Plan will be developed in this regard prior to construction.

#### 4.1.7.3 Social Infrastructure and Services

The presence of workers from outside the local area during construction could have an impact on local social amenities and possibly saturate existing public services (water, electricity, health centres, etc).

While there might be a temporary pressure on these amenities in the short term, there may also be a positive impact on infrastructure development in the longer term. The Project is also expected to will improve the condition of road infrastructure in the area through upgrade of Project access road associated with the construction and operational phases.

The Project is expected to will provide temporary accommodation for some construction workers from outside of the local area. The majority of people working during construction will be from the local area and transportation will be arranged for these workers to the Project site each day. The small number of non-local people will be housed in rented accommodation in the form of an existing hotel or similar type of accommodation facility. The owners and employees of hotels and accommodation facilities used will directly benefit through increase business revenue and profits (identified in the impact above).

The negative impact of an increased workforce population, albeit small numbers, may create some pressure on existing social infrastructure will be most felt during the peak period of construction activities. This would increase the risk of adding pressure to medical resources and existing public services (water, electricity, health centres, etc). However, the impact is short-term as construction works are expected to continue for a period of approximately 18 months. In addition to this, there is the risk of increases in transmissible diseases including COVID-19 putting additional pressure on facilities and services (with additional risks of transmission to local communities).

The impact magnitude is Low as the workforce is likely to represent a small perceptible change to the communities in the Project area but not at the regional level and only on a temporary, short-term basis. Given the potential benefits that are achievable, the impact significance is assessed as **MinorModerate** during construction, even if possible initial change on daily life/routine is expected to be occurs followed by a rapid habituation if mitigation measures are put in place.

It is anticipated that the continual presence of limited number of workers during the operational phase of the Project will have a negligible effect on the demand for medical care and local services in the district. Thus, the impact during operation is considered **Negligible**.

The Project will involve the upgrade of part of the existing access road in the area. This will improve access for farmers, particularly after construction and will aid access to the cemeteries in proximity to the Project. Furthermore, the Project will add 230 MW generating capacity to Azerbaijan existing renewable energy capacity.

A dedicated Workers' Accommodation Plan will be developed prior to construction. Workers' health and safety procedures will be set out in the Occupational Health and Safety Plan including details of a dedicated medical professional to be employed by the Project. Measures to ensure access to local cemeteries around the Project site will also be implemented. Enhancements such as investment in local social infrastructure will be developed and detailed within a Community Development Plan.

#### 4.1.7.4 Community Health

Risks to community health from construction activities such as accidents, chemical releases or such are low provided the community or their livestock do not trespass within the construction area. It is possible that Project activities generating waste, if not carefully managed, could result in contamination of groundwater or surface water. Poor waste management practices also could affect livestock health in the area adjoining the Project site. The impact (negative) significance is assessed to be **Moderate** during construction, while **Negligible** during operation.

Project will cause local employment that will attract direct and indirect opportunities and other potential worker migration. This potential indirect negative impact, which will be local and short to medium term, is assessed to be **Moderate** during construction and **Negligible** during operation.

Community health and safety measures will be developed and included within the Traffic and Transportation Management Plan, Construction EMP, Security and Human Rights Management Plan, elements of the Occupational Health and Safety Plan and the Emergency Response and Preparedness Plan. Potential hazards of the Project during construction and operation to local communities will be detailed and control measures included. Warning signs indicating the presence of the Project along access roads and fencing will be in place for the life of the Project which will reduce the potential for accidents due to people crossing the Project site.

COVID-19 management measures will be set out in the Occupational Health and Safety Plan and Workers' Accommodation Management Plan to reduce risk of spread to local communities.

#### 4.1.7.5 Community Safety and Security

There is the potential for security personnel to use excessive force that results in intimidation or even physical damage, acting as a trigger event to further potential conflicts and Human Rights (HR) risks. The impact is largely reversible with the proper HR training. No security will be armed.

Conflicts between workers of different nationalities or different employers may also occur, including any harassment of females, workers from different ethnic groups, or on other grounds should not be excluded. Women, particularly young girls are at risk from the presence of the incoming workforce who may try to seek sexual services. Interactions between incoming workers (likely to be male) and women (in addition to increasing the incidence of communicable diseases) may raise tensions and increase the prevalence of gender-based violence. The potential impact during construction is considered to be **Moderate** adverse, pre-mitigation.

A Security and Human Rights Management Plan will be developed prior to construction to manage and regulate security related impacts and will include a code of conduct and training for security personnel.

#### 4.1.8 Climate

##### 4.1.8.1 Climate Risk

The most frequent hazardous climatic event in Azerbaijan includes severe winds with heavy rain and large hailstorms. The number of hazardous climatic events have significantly increased over the last 10 years.

It is thus possible that the Project will be subject to increasing air temperatures and frequency of extreme weather events in the longer-term. The rise in air temperatures may result in impacts of minor significance, while increases in heavy rainfall events and high winds may damage Project infrastructure thereby causing moderate to major impacts prior to mitigation.

##### 4.1.8.2 GHG Emissions

With a population of around 10 million, Azerbaijan's CO<sub>2</sub> emissions account for 5.7 tonnes per capita. The largest GHG emissions, on average, in the country are placed within the energy sector at around 75% of all emissions, with agriculture contributing 14%. Azerbaijan's first Nationally Determined Contribution (NDC) sets a new GHG emission target which is a 35% reduction in the level of GHG emission levels by 2030 compared to the 1990/base year.

The project will result in reduction of around 796,637 tons of CO<sub>2</sub>eq per year thereby leading to beneficial impacts. GHG emissions due to the use of generators, transport, on-site equipment, and machinery, during the construction and related to the movement of machinery during maintenance and repair works can be considered minimal.

### 4.3 Stakeholder Engagement Programme

Two rounds of stakeholders' engagement and consultations have been performed during the Scoping (August 2020) and the ESIA (April 2021) phases respectively. Interviews have been carried out with key stakeholders to collect required social baseline data and consultation have been performed through local consultants (Synergetics and Sulaco) in country. Questionnaires have been used to interview the competent ministries and local administrations (community leaders and municipalities' representatives). Information about project has been posted on social media platforms, and leaflets have been distributed through local executive power and municipality offices. In addition to this, LRP stakeholder engagement took place in September 2021 and during January 2022. Consultation has also taken place specifically with women, particularly with females within farmer and herder households to discuss potential livelihood restoration measures.

A Stakeholder Engagement Plan (SEP) has been developed in parallel with the ESIA, setting out identified stakeholders, details of consultation carried out to date, a schedule of consultation proposed throughout the remainder of the Project and community grievance mechanism. Consultation will also continue through the LRP process with affected farmers and herders. There is a specific target for women's involvement in future stakeholder engagement activities particularly for the purposes of the LRP.

### 4.4 Cumulative Impact Assessment

The ESIA investigated the cumulative impacts which could result from incremental impacts from other known existing and/or planned developments in the area based on currently available information. Neither large-scale industrial developments nor other existing or planned solar PV developments have been identified within the Project's AoI. The following developments have been detected in the area of interest:

- Ongoing construction of a new highway with 8 m wide asphalt concrete coating, 21 km long, leading from the Gobustan settlement to the Arabani mud volcanoes located 3.5 – 4.0 km North to the Project site (Agency of Roads of Azerbaijan Republic).
- Testing and commissioning activities of the "Umid-Babek" underground gas pipeline, running from Dashgil gas field to Sangachal terminal, 1.0–6.0 km far from the Eastern border of the Project site (SOCAR).



- The Project site, before the land allocation for the construction of the PV Plant, belonged to the coastal block for onshore exploration, development and production of oil and gas by GOC and SOCAR; potential for further O&G wells to be developed in the vicinity of the Project site cannot be excluded.
- Development of 55 km OHL from the Project site to Janub power plant (PP) in Shirvan City. This OHL is for use by a number of developments including this Project.

Cumulative impacts will largely occur during the construction phase of the Project, as during the operational phase only routine maintenance activities will be undertaken. The assessed significance of potential cumulative impacts on different environmental/social receptors investigated as part of the ESIA is has demonstrated largely minor impacts with Minor to Moderate impacts expected on habitats / semi-desert vegetation, terrestrial fauna and impacts on farmers and herders in the area. Mitigation is provided in the ESIA to assist with reducing potential impacts.

## **5 Environmental and Social Management & Monitoring Plan**

The ESIA includes an Environmental and Social Management & Monitoring Plan (ESMMP) which provides an outline plan for managing and monitoring the environmental and social impacts during construction, operation and decommissioning of the Project.

Management plans consist of a combination of operational policies, procedures, and practices. The measures and actions to address identified impacts and risks will favour the avoidance and prevention of impacts over minimization, mitigation, or compensation, wherever technically and financially feasible. Where risks and impacts cannot be avoided or prevented, mitigation measures and actions have been identified so that the Project operates in compliance with applicable laws and regulations and meets the requirements of IFC Performance Standards (PSs) and EBRD Performance Requirements (PRs). The mitigation, monitoring and performance improvement measures will be incorporated into the Project Environmental and Social Management System (ESMS) developed by the Company.

The construction management plans are anticipated to include (but not be limited to):

- Site Mobilisation Plan.
- Construction Environmental Management Plan (including pollution prevention and control procedures, landscape and biodiversity management and monitoring and community health and safety amongst other elements).

- Hazardous Materials & Waste Management Plan (including Wastewater Management).
- Chance Find Procedure.
- Traffic and Transportation Management Plan (including community safety measures).
- Security and Human Rights Management Plan (including community safety measures).
- Community Development Plan.
- Gender Management Plan.
- Contractor and Supplier Management Plan.
- Occupational Health and Safety Plan (including COVID-19 management procedures and register).elements of community health and safety).
- Emergency Preparedness and Response Plan (including community awareness and notifications).
- Livelihood Restoration Plan (LRP)
- Labour and Working Conditions Management Plan (including Workers' Code of Conduct; Local Hiring Plan, Workers' grievance mechanism)
- Workers Accommodation Management Plan (including COVID-19 management procedures and register).
- Stakeholder Engagement Plan. (including Community grievance mechanism).

During both construction and operation, certain activities, indicators and environmental and social receptors will be monitored. Monitoring may include observation and recording or may include data gathering and sampling. Monitoring reports will be required from the Contractor and Operator during the construction and operational phases. The monitoring results will be useful for assessing the long-term cumulative effects, if any. If on-going problems occur, adaptive mitigation measures can be developed and implemented.

The management system clearly defines the desired outcomes or targets and provides the means to meet those targets. The performance of the management system will be tracked through a suite of performance indicators that can be tracked over defined reporting periods, and if necessary, further mitigation would be implemented if targets fail to be met.

## 6 Further Information & Contact Details

Full project documents, including the ESIA, NTS, and Stakeholder Engagement Plan (SEP) including the grievance mechanism for affected stakeholders and communities will be available at the following locations:

**“Masdar Azerbaijan Energy” LLC**

Contact Point: Murad Sadikhov, General Manager

Email: [msadikhov@masdar.ae](mailto:msadikhov@masdar.ae)

Phone: +994 50 9885837

Address: 43, Mammad Araz Street, Narimanov District, Baku, AZ1106, Republic of Azerbaijan