

# Nur Bukhara Solar PV and Battery Energy Storage System

Environmental & Social Impact Assessment (ESIA):  
Volume I – Non-Technical Summary

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## Document Information

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## Document Control

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## List of Abbreviations

<b>Acronym</b>	<b>Definition</b>
ABIS	Amu-Bukhara Irrigation System
ADB	Asian Development Bank
AOI	Area of influence
BESS	Battery energy storage system
CC	Civil Code
CHS	Community Health and Safety
DC	Direct current
EBRD	European Bank for Reconstruction and Development
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
EPC	Engineering, procurement, and construction
E&S	Environmental and social
ESAP	Environmental and Social Action Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environment and Social Management Plan
ESMS	Environmental and Social Management System
ESP	Environmental and Social Policy
GBVH	Gender-Based Violence and Harassment
GIIP	Good International Industry Practice
GM	Grievance mechanism
IFC	International Finance Corporation
ILO	International Labor Organisation
JE	Juru Energy
LRP	Livelihood restoration plan
LC	Land Code
LILO	Line-in Line out
LLC	Limited liability company
MNR	Ministry of Natural Resources
NEGU	National Electric Grid of Uzbekistan
NTS	Non-technical summary
O&M	Operations and maintenance
OHS	Occupational Health and Safety
OHTL	Overhead transmission line
PIT	Project implementation team
PPA	Power purchase agreement
PR	Performance Requirement
PS	Performance Standard
PV	photovoltaic
ROW	Right of Way
SanPiN	Sanitary Regulations and Norms of Uzbekistan
SEP	Stakeholder engagement plan

## PREFACE



Abu Dhabi Future Energy Company PJSC (“Masdar”) has been awarded, by the Ministry of Energy, Government of Uzbekistan, the design, build, finance, construct, commission and operate, maintain and transfer (DBFOMT) of the Nur Bukhara Solar photovoltaic (PV) Project with a capacity of 250 MW<sub>A</sub> and 63 MW/126 MWh Battery Energy Storage System (BESS) (“Project”). The Project will be implemented through a long-term, i.e., 25-year power purchase agreement (a “PPA”) between Nur Bukhara Solar PV LLC Foreign Enterprise and JSC National Electric Grid of Uzbekistan (“NEGU”). Masdar has appointed Juru Energy Ltd. (“JE” or the “ESIA Consultant”) to perform an environmental and social impact assessment (ESIA) for the Project.

This document is the non-technical summary (NTS), which aims to summarise the key information and outcomes from the ESIA process. This NTS aims to present clearly and simply the findings and conclusions of the environmental and social (E&S) impact assessment and public consultation process.

Information disclosure on the draft of ESIA was completed on the 30 and 31 of May 2023, via public meetings and group meetings with responsible organizations, land users, and people from the nearest communities to the Project. The disclosure aimed to communicate the findings of the ESIA. The final ESIA is also disclosed. This version of the NTS and ESIA documentation is available on the Masdar website and locally. Brochures have been left with stakeholders, and copies of this NTS in English and Uzbek have been placed for viewing at:

- Alat Khokimiyat
- Kulchovdir community office and Kulonchi community office

Final ESIA disclosure meetings are also planned for September 2023 in the local communities. The date and venue to be confirmed closer to the date. Information will be communicated to the stakeholders at least 14 days before the meeting via official notifications to Alat Khokimiyat and community leaders and Telegram notifications. Questions or comments can also be addressed via the channels outlined below.

ESIA Consultant: Juru Energy	Developer
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# 1. Introduction

## 1.1 Overview of the Project

The Nur Bukhara Solar Photovoltaic (PV) Project with a capacity of 250 MWA and a 63 MW/126 MWh Battery Energy Storage System ("Project"). The Project includes a 30 m line-in-line-out (LILLO) overhead line (OHTL) to connect the Project's new substation to an existing OHTL (requiring an upgrade to approximately 300m of existing OHTL). There are no associated facilities for the Project as defined by Lender standards.

Following the Resolution "On the State Environmental Expertise", approved by the Resolution of Cabinet of Ministers No. 541 "On further improvement of the environmental impact assessment mechanism" (2020), a national Environmental Impact Assessment (EIA) Study and outcomes of the public hearing has been submitted to Ministry of Environment and Natural Resources (MENR).

The ESIA has been developed following the requirements of national law, the International Finance Corporation (IFC) Performance Standards (PSs), Asian Development Bank (ADB) Safeguard Policy Statement 2009 (SPS 2009) and with reference to the European Bank for Reconstruction and Development (EBRD) Environmental and Social Policy 2019 (ESP 2019) Performance Requirements (PRs) and the Equator Principles.

The Project must undergo a separate national environmental impact assessment (EIA) process, submitted as a separate document to the Ministry of Natural Resources for approval (Application Number 81208) on 22 May 2023. The Stage 1 resolution was received on 26 June 2023 and further supplementary documentation has been submitted for the Stage 2 submission on 05 August 2023. A positive Stage 2 resolution was received on the 22<sup>nd</sup> August.

The Project is understood to be categorized as Category B by Lenders. Category B projects require an assessment of environmental and social impacts and associated documents. To meet this requirement, an environmental and social impact assessment (ESIA) has been prepared as follows:

- Volume I: Non-technical summary (NTS) (this document)
- Volume II: Environmental and social impact assessment (ESIA)
- Volume III: Technical appendices
- Volume IV: Environment and social management plan (ESMP)
- Volume V: Stakeholder engagement plan (SEP), including grievance mechanism

- Volume VI: Livelihood restoration plan (LRP)

Masdar’s mission is to develop, invest in and deliver high-quality, sustainable and economically viable clean energy projects locally and globally. Masdar has over a decade of experience as a renewable energy developer and investor. It is active across 40 countries and has developed some of the world’s most significant solar and wind energy projects, and it has invested or committed to invest in renewable energy projects with a gross capacity of over 20 GW. Masdar. In Uzbekistan, Masdar has a 100 MW utility-scale PV solar plant in operation and another 1,600 MW of projects under various stages of development. Masdar will establish a Project Company (Nur Bukhara Solar PV LLC FE) for day-to-day implementation.

## **2. Project Description**

### **2.1 Project need**

The Government of Uzbekistan aims to increase its power supply and has adopted the 2030 Energy Strategy, which defines several objectives and directions for electricity supply between 2020-2030, including the rapid development of renewable energy projects. The Project will support Uzbekistan to:

*2030 Energy Sector Strategy sets a key objective to “develop and expand renewable energy use and its integration into the unified power system” (BDS18-237(F)) Green Economy Transition promotes “cleaner production and distribution of energy through greater energy and resource efficiency” (BDS15-196(F)).*

- Add 250 MW of power supply to the national grid.
- Reduce energy dependence on carbon-based fuels and reduce greenhouse gas emission rates.
- Meet renewable energy targets.

### **2.2 Alternative options**

Alternative concepts and connection options have been considered, including the “do nothing” option. Not constructing the Project will avoid any potential E&S impacts; however, this will hinder the objectives of the country’s Energy Sector Strategy and renewable energy transition goals. The preferred site was allocated to the developer by the Ministry of Energy on behalf of the Government of Uzbekistan as part of a broader competitive auction process to identify PV development opportunities in Uzbekistan. This was undertaken with support from international consultants as part of preparations for the Project auction. The site was further optimized to provide the best balance between maximizing generation output and minimizing the length of the grid connection, impact on land users and herders, and maintaining a water protection setback of at least 70

meters at the nearest point from the Amu-Bukhara Irrigation System (ABIS) canal and a health protection set back of 250 meters. Final decisions on the internal PV panel layout and design of the Project components may be subject to change by the Engineering Procurement and Construction (EPC) Contractor selected to build the Project. This ESIA has identified specific mitigations to include in the construction contractor design.

### **2.3 Project location**

The Project site covers approximately 649 ha of land in the Alat District of the Bukhara region in the southwest of the Republic of Uzbekistan. The site is 24 km southeast of Alat City, approximately 25 km northwest of the border with Turkmenistan. The site is flat and is surrounded by the ABIS canal to the North, South and East. The regional road R78 runs alongside the site's northern boundary, and there is a drainage channel and small ponds approximately one kilometre to the west of the site. The following figures show where the Project is located in Uzbekistan (Figure 1), the Project site (Figure 2), the site layout (Figure 3) and key receptors (Figure 4). The nearest communities are Kirlishon (10 km) and Kulchovdur (11 km).

Figure 1: Project Location

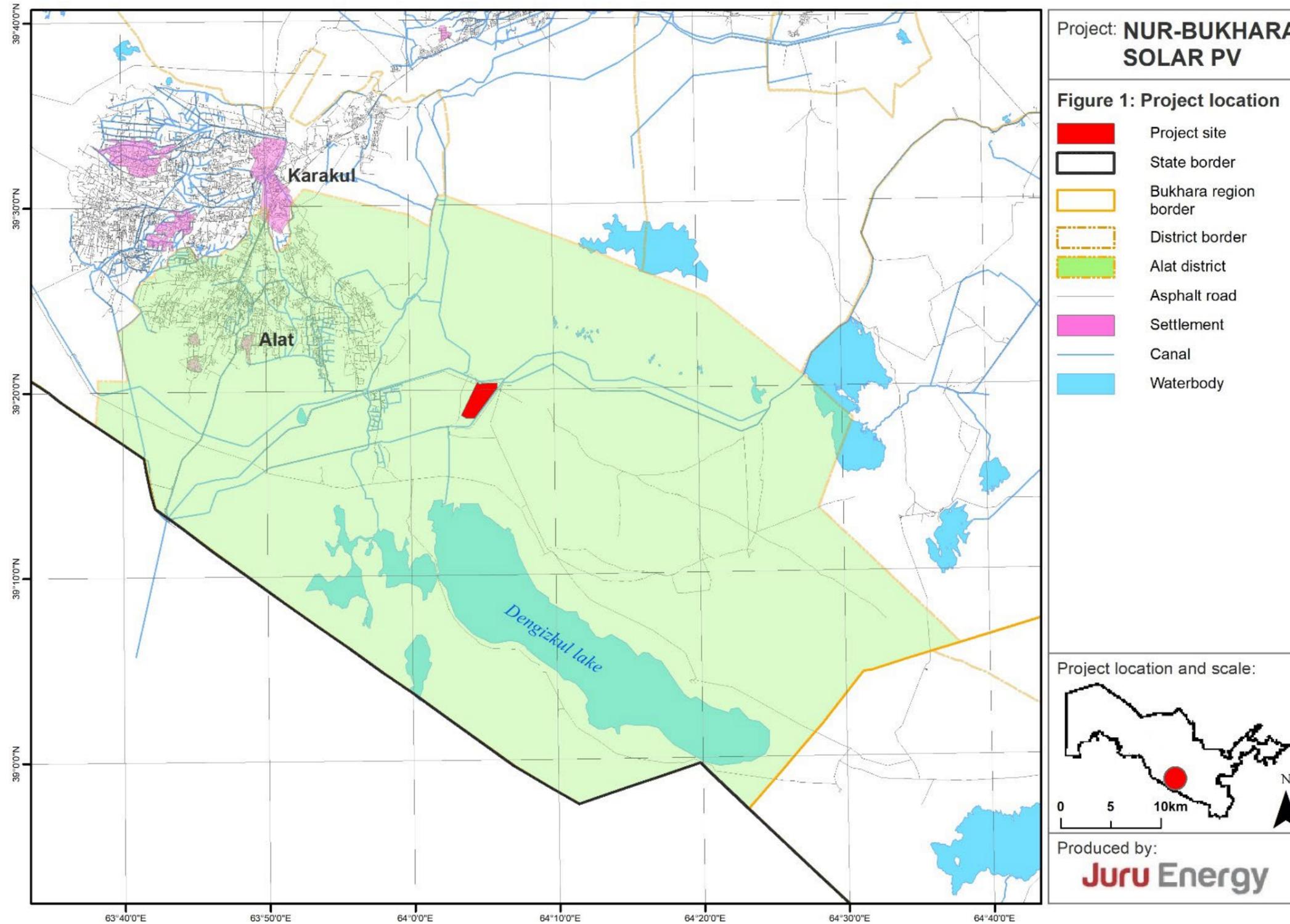


Figure 2: Project boundary

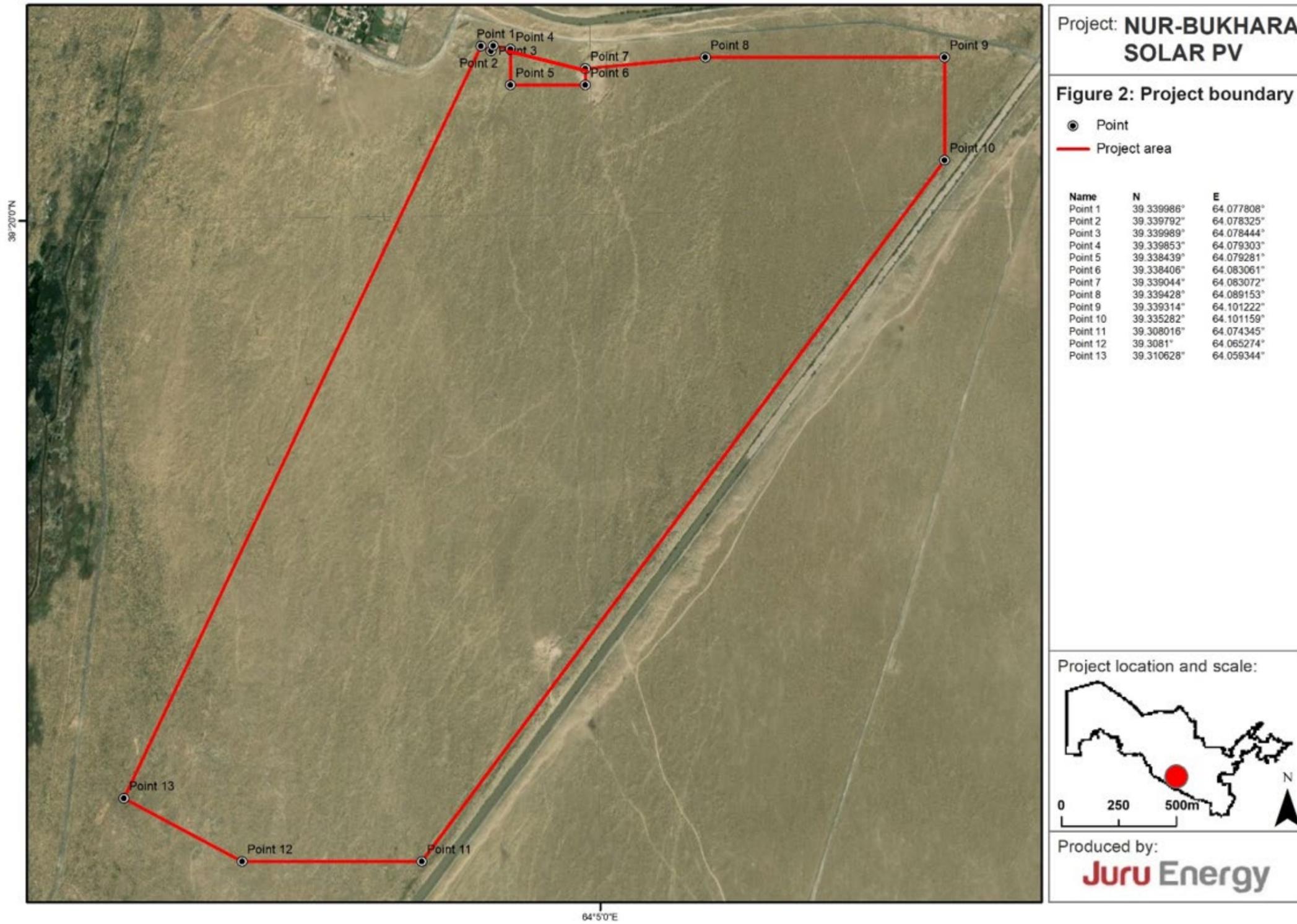
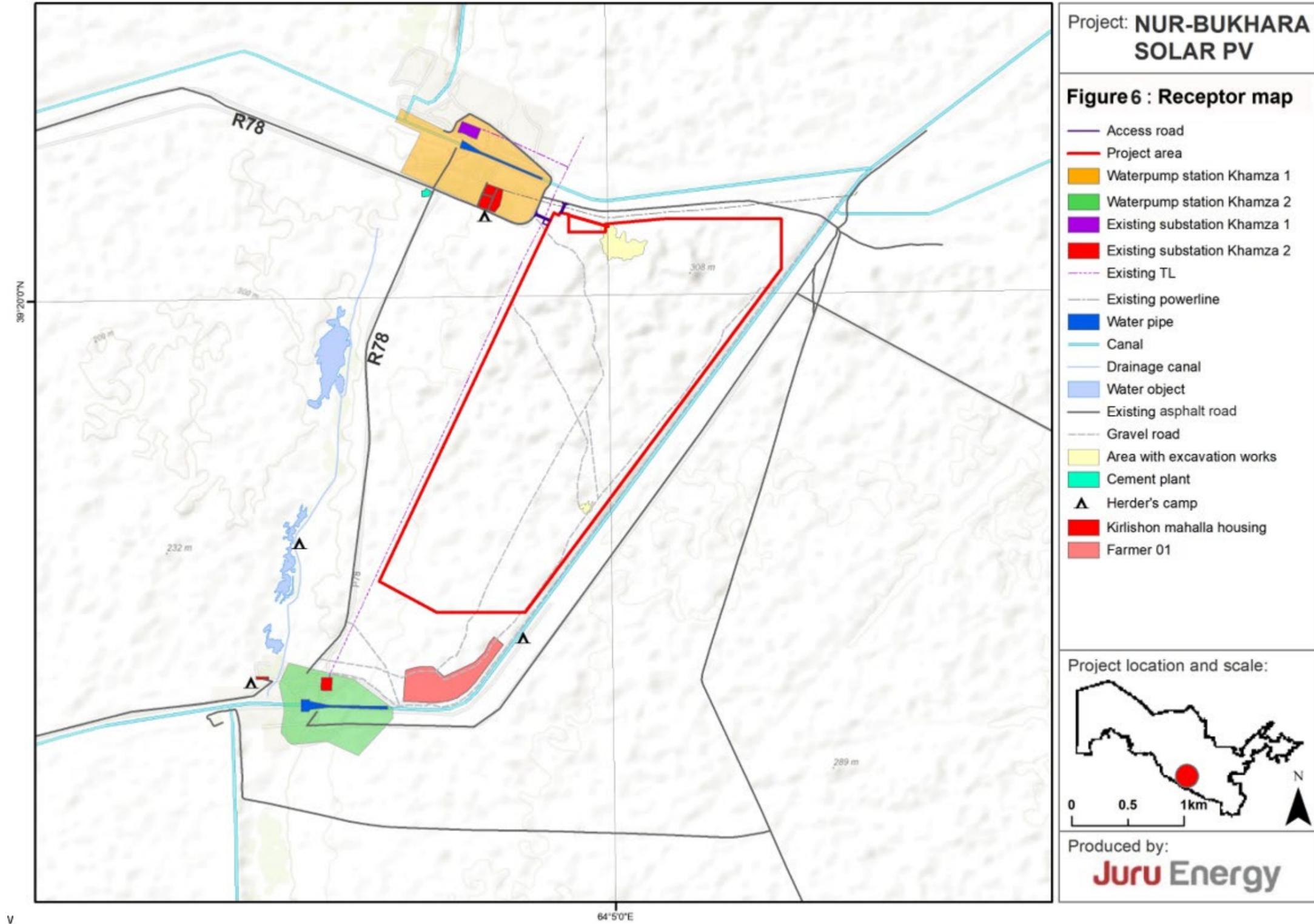


Figure 3: Project layout



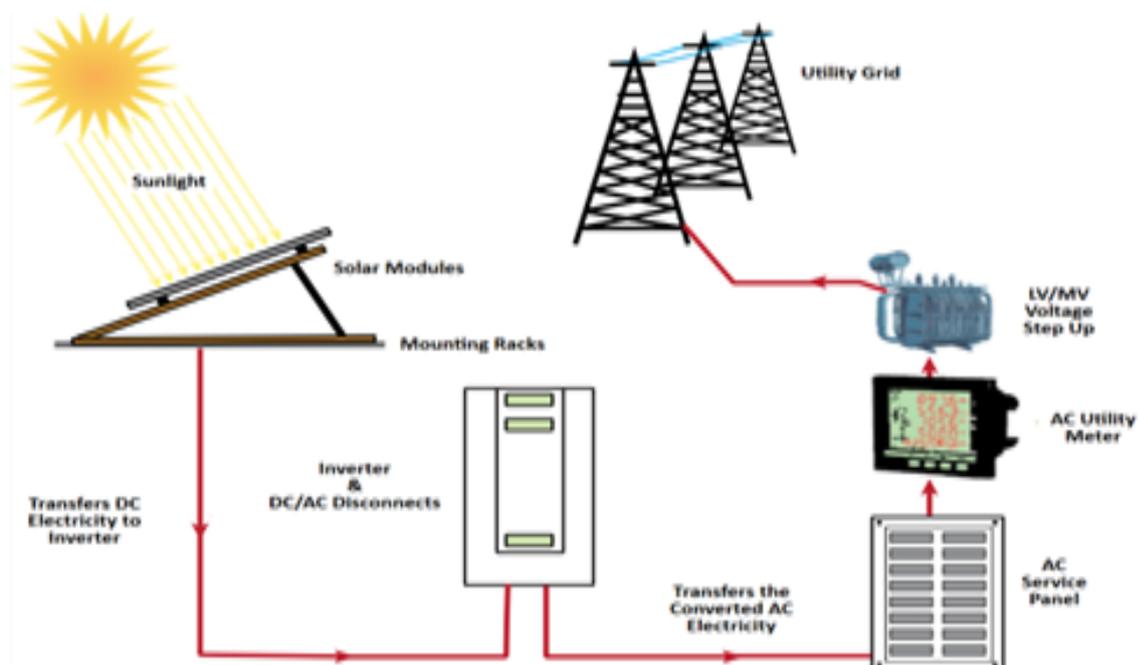
Figure 4: Project Receptors at the Project site



## 2.4 Project components

Photovoltaic (PV) power uses solar panels to convert sunlight into electricity by converting solar radiation into DC electricity. PV inverters convert the direct current that will be transformed into alternating current via transformers to raise the voltage from Low Voltage (LV) to Medium Voltage (MV). Then, the energy generated will be conducted through an underground medium voltage (MV) network of 35 kV to the 35/220 kV substation. An overview of the process is illustrated in Figure 5 below.

Figure 5: Overview of the PV process (compiled from IFC, 2015<sup>1</sup>)



The main components of the Project are:

- 513,582 PV modules (half-cut monocrystalline silicon technology);
- Single-axis tracker, inverters and transformers;
- Lithium-Ion (Li-ion) battery energy storage system (BESS) consisting of four 40ft containers;
- Underground cabling system;
- 35/220 kV substation (new);

<sup>1</sup> Utility-Scale Solar Photovoltaic Power Plants: A Project Developer's Guide

- 30 m 220 kV line-in-line-out (LILO) connection to an existing overhead transmission line (OHTL), "Karku'l 500 SS" - "Hamza-2 SS" from the Project's Substation via a ~30m 220 kV OHLT;
- One new tower for LILO connection;
- Dismantling and rebuilding approximately 300 m of existing OHTL to enable the new LILO connection;
- On-site buildings, including an operational control centre, office, welfare facilities, security guard house, storage facilities and stores;
- New access from Highway R78;
- New internal access roads; and
- Site drainage system.

Figure 6 to Figure 9 illustrate the typical project components.

*Figure 6: PV panels*



*Figure 7: PV tracking system and inverters (Single-axis trackers follow the sun east-to-west on a single point. NEXTracker)*



*Figure 8: Battery container (internal)*



*Figure 9: Typical container BESS (external)<sup>2</sup>:*



<sup>2</sup> <https://energycentral.com/c/cp/large-battery-energy-storage-systems>

## **2.5 Project activities**

The following activities will be undertaken to develop the Project:

- Site mobilization;
- Civil works;
- Procurement and transportation of equipment;
- Equipment installation;
- Waste generation and disposal;
- Commissioning;
- Operation and maintenance (O&M); and
- Decommissioning.

Construction of the Project will be confined to the Project site, access road and existing OHTL right of way (ROW). The main construction activities are site clearance (rocks, utilities, vegetation), establishing vehicle access, civil works (OHTL, substation and main site), equipment delivery of PV panels and supporting infrastructure, BESS, installation and commissioning. The duration will be approximately 12 to 16 months. Site establishment and civil works are expected to take three months, followed by eight months for installation and a further three months for commissioning. Work on-site is planned to start at the end of 2023. A material storage area will be established within the main site boundary. The water needs for the construction process will be from a municipal water source and tankered to the site for short-term storage. Cement will be from a nearby batching plant and not produced on-site reducing dust and noise impacts.

The Project may have some on-site accommodation (adjacent to the substation site) but contractors will also use offsite accommodation provided it meets Lender standards<sup>3</sup> and adheres to the management and measures stipulated in the ESIA. All accommodation will be subject to Owner and Lender inspections and audits.

The expected lifetime of the PV and BESS infrastructure is 25 years and ten years for the batteries. At the end of its design lifetime, options will be considered to replace, repair, or remove all infrastructure from the site.

## **2.6 Land take requirements**

There is a possibility of both temporary and permanent land take requirements as a result of the Project. The laydown areas and worker accommodations will be constructed

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<sup>3</sup> Workers' accommodation: processes and standards. A guidance note by IFC and the EBRD (2009)

within the Project limits. Servitude rights will also be required for the area underneath the OHTL right of way. The total estimated land take is 645 ha. The land plot allocated to the Project is owned by the State Committee for Sericulture and Wool Industry Development (SWID) for an indefinite time period. Seven households (villagers V1-V7) from the Kirilishon community (i.e., the settlement that is located opposite the Project site near to Khamza 1 substation) and one herder and this partner (herders H1 and H2) with formal land right granted for ten months by “Alat Qoraqolchilik” LLC” (the company that administers the land), to graze that land, have also been identified. A 70 m setback has been agreed upon with the Alat District Sanitary Epidemiological Wellbeing Department between the ABIS canal and the site boundary.

## 2.7 Labour requirements

The total workforce required during the peak construction period is approximately 600 workers (40% skilled and 60% non-skilled). While employment of local community members with the required skills will be prioritized, the number of employment opportunities for local workers in unskilled or semi-skilled temporary work during construction may be limited and less so during operation.

## 2.8 Schedule

Table 1: Project schedule

Activity	Date
Scoping	March 2023 (completed)
Consultation on national EIA	Late April 2023 (completed)
Submission of national EIA	05 May 2023 (completed)
Submission of draft ESIA	End of May 2023
Lender disclosure period	Aug-23
Finalise ESIA (including public consultation comments, Lender comments and ongoing studies)	Aug-23
EIA Approval	Aug-23
Financial close	Oct-23
Finalise LRP compensation obligations (pre-construction)	Aug-23
Finalize Project Company and EPC-ESMS (pre-construction)	Sep-23
Early Work program	Aug-23
Limited Notice to Proceed to EPC (site clearance and preparation works)	Sep-23
Construction Start (inverter Skid foundation, civil works, BESS)	Nov-23
1st Module Delivery at Site	Feb-24
Tracker and Module Mechanical Works	February 2024 to August 2024

Electrical works (switchyard and MCR)	February 2024 to August 2024
Commissioning	Jul-24
Early generation	Aug-24
Commercial Operation Date (FC plus 12 months)	Dec-24
Expected Lifetime	25 years (2024 to 2049) (BESS to be renewed after 10 years)

Note: For clarity, early site mobilization includes the construction of the temporary site facilities, telecommunication equipment, worker welfare facilities, road improvements and site fencing. Works on the solar field (including clearance, levelling or any earthworks in the solar field) or any work on the energy production infrastructure of the PV plant is not considered early site works.

### 3. Assessment Approach

#### 3.1 Legal and policy framework

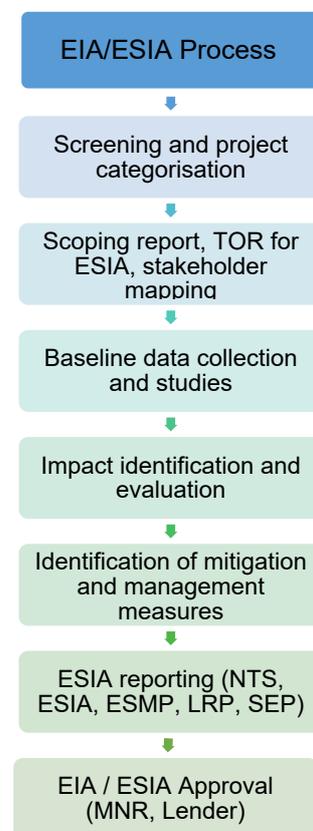
The Project has been assessed against the national regulatory framework and the requirements of International Finance Corporation (IFC) Performance Standards (PSs), ADB Safeguard Policy Statement 2009 (SPS 2009), World Bank Group Environment, Health and Safety Guidelines (General), international environmental conventions, core labour conventions of the International Labour Organisation (ILO) and United Nations (UN) and Good International Industry Practice (GIIP). Reference has also been made to EBRD performance requirements (PRs) and Equator Principles. Under the IFC PSs and EBRD PRs, we consider this Project Category B. No associated facilities as defined by IFC PSs are identified.

Under national law, the Project is categorized as B, requiring an environmental impact assessment (EIA). The Project EIA has been developed to comply with Uzbek national laws and regulations for environment, health and safety, labour and land.

#### 3.2 Assessment methodology

The ESIA has identified and evaluated potential E&S impacts the Project may have on the environment and communities within the direct and indirect area of influence (AOI). The evaluation of impacts has considered the magnitude of the predicted impacts and the sensitivity of the receptors (physical, human or biological) as defined by the baseline studies and data collection. This ESIA and its

*Box 1: Steps in the Community Grievance Mechanism (GM)*



supporting documentation are prepared following the steps outlined in Box 1. The magnitude of the impact considers:

- type and nature of impact (positive/negative)
- spatial extent (e.g., local, regional, global)
- duration (continuous/temporary)
- time period (immediate / delayed)
- reversibility (reversible/irreversible)
- likelihood to occur (none, small, average, high).

The sensitivity of the receptors considers the ability of receptors to absorb the change or recover from change once the impact is removed.

***Magnitude (high, medium, low) combined with sensitivity (high, medium, low) have been combined to assign an impact significance category as follows:***

- **Critical:** These effects represent key factors in the decision-making process. They are generally, but not exclusively, associated with impacts where mitigation is not practical or would be ineffective.
- **Major:** These effects are likely to be essential considerations but where mitigation may be effectively employed such that resultant adverse effects are likely to have a Moderate or Slight significance.
- **Moderate:** These effects, if adverse, while important, are not likely to be key decision-making issues.
- **Minor:** These effects may be raised but are unlikely to be important in the decision-making process.
- **Neutral:** No effect, not significant, no need to be considered as a determining factor in the decision-making process.

Specific areas of focus for the ESIA include ecological impacts on the; Shovelnose Sturgeon *Pseudoscaphirhynchus kaufmanni*, Central Asian Tortoise *Testudo horsfieldi*, plant species *Calligonum mattheianum* and *Calligonum mole*, water birds and Central Asian Otter, physical impacts, e.g., noise, air quality, surface water runoff, and social impacts e.g., livelihoods, worker influx, supply chain, community health and safety, employment and labour rights and worker welfare.

Mitigation, management and monitoring measures identified in the ESIA have been included in an ESMP (Volume IV), which outlines a framework across the different phases of the development cycle. A set of standalone topic management plans will also be developed in addition to the framework ESMP.

Mitigation measures have been identified following the mitigation hierarchy of avoid, reduce/minimize, mitigate and compensate/offset to reduce impact significance to acceptable levels (residual significance). All contractors will be required to demonstrate that they have the policies, plans and procedures in place to implement the requirements of the ESMP. Masdar, the Project Company and the Lenders, or their representatives, will undertake regular audits of works against the requirements of the framework ESMP.

### **3.3 Stakeholder engagement**

An essential part of the ESIA process has been consultation with local communities and other interested groups (collectively known as stakeholders). A systematic approach to stakeholder engagement has been employed to build a constructive relationship with stakeholders, particularly the directly affected communities (ACs). Existing and future plans for engagement are set out in the Project communication plan, called the Project Stakeholder Engagement Plan (SEP). Stakeholder engagement started in February 2023 with a scoping site visit and will continue throughout the Project's lifetime.

The Project has held public meetings and one-on-one meetings with various stakeholders, including:

- ESIA public meetings to disclose the findings of the draft ESIA.
- EIA public hearing.
- Letters to government bodies (national, provincial, municipal and district departments/khokimiyats), including the Alat municipality cadastral department.
- Meetings with:
  - Regionally based industries, community leaders
  - Project-affected communities (PAC) (Kirlishon and Kulchovdur communities)
  - Kirlishon and Kulchovdur community representatives
  - Formal land users (“Alat Qoraqolchilik” LLC, Herders H1 and H2);
  - Informal land users (villagers of Kirilishon community – V1-V7 households)
  - Alat District Sanitary Epidemiological Wellbeing Department
  - Amu Bukhara Main Canal Department
  - Businesses and operations in the area (CNTIC company)
- Focus groups with vulnerable groups (women, youth and children, elderly or disabled and illiterate or semi-literate persons)
- Focus groups informal land users (herders)
- Letters to the Institute of Botany, Cultural Heritage Agency, Institute of Archaeology and SWID

The following figures depict some of the activities performed.

Figure 10: ABMC workers (pumping station 16 of Khamza 1 substation)



Source: Juru Energy

Figure 11 Kirlishon community members



Source: Juru Energy

Figure 12 Kulchovdur community members



Source: Juru Energy

Figure 13 Alat District Construction Department



Source: Juru Energy

Comments and concerns raised by stakeholders were logged and responded to during the consultation events. Comments received included:

- A wish to continue livelihood practices on or in the vicinity of the site – which was explained through clarification of the location of the site and the allocation of alternative grazing land.
- Employment opportunities – which will be prioritized for local community members where possible.
- Support constant communication with the community during construction – the Project will deploy a community liaison officer (CLO) to communicate with the local communities during construction and operations.
- Options to improve water and other community infrastructure opportunities – Masdar has taken a note of the recommendations to be discussed further during the construction phase.

A complete list of the stakeholder engagement undertaken to date on the Project can be found in Volume V: SEP and is summarised in Volume II: ESIA. A detailed overview of measures to address livelihood compensation and improving employment opportunities are summarised below and provided in more detail in Volume VI: LRP.

### 3.4 Grievance mechanism

Any concerns, issues, or questions (“grievances”) any stakeholders may have can be raised to the Project via the “grievance mechanism” (GM). The GM sets out the project commitments to acknowledge, investigate and respond to all concerns. Contact details for each of these methods are included in the introduction.

The steps in the GM are provided in Box 2. Grievances can be raised through the following methods:

- Directly to Project staff during meetings or Project site visits.
- Via telephone calls.
- In written form (text messages, via e-mail, mobile applications, letters, written requests).
- In boxes located at the district khokiyimat office.
- Via Masdar website.

Box 2: Steps in the Community Grievance Mechanism (GM)



The grievance mechanism keeps **strict confidentiality of data**, including the personal information of all applicants. All grievances **can be submitted anonymously**. In cases where the complainant is unsatisfied with the proposed solution/response to the grievance, they have the right to take other legal action to resolve the grievance.

Step 1: Upon receiving a grievance by any means of communication, the Grievance Manager will enter the grievance into the grievance log to ensure that all raised concerns/inquiries are investigated and addressed.

Step 2: After receipt and registration of a grievance, a complainant will receive written notification that includes a proposed timeline for investigation depending on the request and the preliminary time of receipt of a response. A grievance form and log will keep a tracked record of each grievance received.

Step 3: Allocated members of the ESIA consultant team will be responsible for receiving and monitoring grievances during the ESIA phase of the Project. The grievance form is prepared based on the location, language preferences, and communication opportunities of identified stakeholders. Responses will be provided in a language suitable for the complainant, i.e., Uzbek or Russian.

Step 4: The resolution of grievances will be formally communicated to the complainant in written form. If a complainant cannot receive a written response, the complainant will be contacted via phone and informed of the results of their grievance. The table below provides the timeframes for response to grievances. If the complainant is not happy with the response, an appeal may be submitted. Furthermore, submitting a grievance through the grievance mechanism will not preclude a complainant in any way from also seeking recourse through the national legal system, and the complainant can take this course of action should they not be satisfied with the response they receive to their grievance if they wish.

The approaches taken to resolve grievances will depend on the nature, frequency of occurrence and the number of grievances.

*Table 2: Grievance Processing Timeline*

<b>Stage</b>	<b>Timeline</b>
Receipt and registration of grievance	Day 0
Providing acknowledgement of grievance receipt to the complainant	Maximum three days after submission of grievance
Assessment/investigation of the received grievance	Maximum two weeks after submission of grievance
Providing the complainant with a response	Maximum three days after assessment has been completed
Reassessment of grievance in case the complainant is not satisfied with the previously provided response	Maximum two weeks after notification of dissatisfaction by the complainant

Where complex grievances or other factors are extending the investigation time, the complainant will be informed of this delay, advised of an updated expected timeline for a response, and provided regular updates.

## 4. Summary of environmental and social assessment

### 4.1 Overview

Potential impacts over a potential area of impact of 50 km from the Project site have been assessed, and the residual risk evaluated based on the proposed mitigation measures set out in the ESIA. Topics assessed in the ESIA are summarised in Table 3, based on the scoping assessment and stakeholder consultation outputs. The ESIA has assigned all residual impacts a moderate or lower significance level.

Table 3: Risks and impacts assessed in the ESIA

Environment and Health	Social	Labor
<ul style="list-style-type: none"> <li>• Construction nuisance - air quality, noise and vibration (construction)</li> <li>• Waste (including hazardous waste) (all phases)</li> <li>• Climate resilience (operation)</li> <li>• Soil erosion (construction)</li> <li>• Water resources (construction)</li> <li>• Hydrogeology (construction)</li> <li>• Biodiversity - habitat loss, impact on critical habitat and Priority Biodiversity Species (PBF) (all phases)</li> <li>• Cumulative impacts (construction)</li> </ul>	<ul style="list-style-type: none"> <li>• Community health and safety (all phases)</li> <li>• Traffic and transportation (construction)</li> <li>• Security (construction and operations)</li> <li>• Livelihood and land use (all phases)</li> <li>• Cultural heritage (construction)</li> <li>• Gender-Based Violence and Harassment (GBVH) (all phases)</li> </ul>	<ul style="list-style-type: none"> <li>• Occupational health and safety (all phases)</li> <li>• Emergency preparedness and response (all phases)</li> <li>• Labor rights and worker welfare (all phases)</li> <li>• Employment (positive) (construction and decommissioning)</li> <li>• Sexual harassment (all phases)</li> <li>• Human rights (all phases)</li> <li>• Procurement/supply chain (all phases)</li> </ul>
<p><b>The following topics were scoped out from assessment in the ESIA based on scoping surveys and stakeholder engagement<sup>4</sup>.</b></p> <ul style="list-style-type: none"> <li>• Air quality (operation)</li> <li>• Noise (operation)</li> <li>• Soils (operation)</li> <li>• Landscape and visual impact, including glint and glare (all phases)</li> <li>• Radio and TV interference (all phases)</li> <li>• Traffic and transportation (operation)</li> <li>• Greenhouse gases (all phases)</li> <li>• Cultural heritage (operation and decommissioning)</li> </ul>		

<sup>4</sup> Full details of scoping survey can be found in Nur Bukhara Scoping report (March 2023)

- Cumulative impacts (operation )
- Indigenous Peoples (all phases)
- Transboundary impacts (all phases)
- Electric and magnetic fields (EMF)/ Electromagnetic current (EMC) (all phases)

## **4.2 Positive impacts and enhancements**

The ESIA identified the following potential positive impacts as set out in the ESIA report:

- Temporary and permanent job creation (including prioritisation of jobs for local people and women);
- Indirect creation/expansion of business opportunities (food delivery, driving, accommodation, sale of locally available materials (cement, hardware);
- More stable and diversified electricity network; and
- Clean energy generation/reduction in carbon / national greenhouse gas (GHG) emissions.

## **4.3 Supply chain and labour management, and worker health and safety**

Masdar has a clear commitment to promoting fair labour and working practices throughout the lifecycle of the Project. To manage this, the Project will develop a; workers' code of conduct, a security personnel's code of conduct, and a labour and working conditions management plan. A Labour and Working Conditions Plan and Gender Management Plan will also be developed to maximize employment opportunities for local communities and women.

The Project will require its contractors and sub-contractors to adhere to national labour regulations and the requirements of *IFC PS2: Labour and working conditions*; at all times. IFC PS2 recognizes that the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers, including promoting diversity, fair pay, rest periods, non-discrimination, working time regulations and overtime restrictions.

Masdar will undertake a supply chain due diligence for the solar, battery and transformer components following the Masdar supply chain policy and management system. Masdar has zero tolerance for labour violations. Requirements for maintaining worker safety, e.g., during site clearance or while working with electricity, moving machinery and working at height, will be defined in an occupational health and safety (OHS) plan and implemented through a permit-to-work system. The OHS plan will include requirements to undertake activity-specific risk assessments and assign the correct safety measures, such as safety supervisors, training and personal protective equipment (PPE). Specific criteria will be applied to manage potential risks to workers from naturally high soil contamination

levels. The effectiveness of the OHS plan will be monitored through regular inspections, audits and monitoring, including health monitoring. All workers will have access to a workers' grievance mechanism, an essential process by which workers can access remedies for poor worker practices. Accommodation (on and off-site) will be managed following national standards, Lender guidelines and GIIP.

#### **4.4 Emergency preparedness and response**

Given the nature of the equipment on site and the distance from the Kirlishon and Kulchovdur communities and nearby farming land, it is unlikely the Project will pose an immediate risk to the local community. The Project site is relatively remote, so access to medical facilities or support from local emergency services may be difficult. Natural hazards, including dust storms and earthquakes, and climate-related risk events, e.g., extreme rain, may also occur unexpectedly. The Project will develop an emergency preparedness and response plan (EPRP) and conduct emergency drills throughout the construction and operation phases. Coordination with local emergency services will be undertaken to ensure the needs of the Project are met without compromising local community needs, and medical/first aid kits, trained first aiders, and an onsite doctor/nurse will be provided during construction. Residual significance is determined as minor.

#### **4.5 Climate resilience and adaptation**

The technical operation of the Project and worker welfare are susceptible to physical climate-related risks, including trends for more frequent storms (dust storms), extreme rain events (that may create wet soil conditions that, if not accounted for, can lead to runoff and soil erosion issues), and potential for prolonged periods of extreme heat during the summer months. These may lead to a higher prevalence of heat-related medical conditions or greater restrictions on periods of physical work. Climate-resilient design choices and emergency response planning are key to managing these impacts. Design recommendations have considered climate projections up to 2060 and whether there is a need to reinforce the structures/foundations for higher design standards (stronger winds, higher temperatures). Emergency preparedness plans will include evacuation protocols and sheltering against dust storms, thresholds for stopping work when the temperature exceeds safe limits, extended rest periods, and adequate drinking water. Contractors will be required to establish an early warning system for wind and extreme heat events through continuous weather monitoring and provide awareness training to workers on their rights regarding working in these conditions. Residual significance is determined as minor.

#### **4.6 Construction nuisance (noise, air quality)**

Mitigation measures to ensure that dust and noise impacts on nearby sensitive receptors (i.e., nearby grazing herders, ABIS canal) within 250 m of the site will be implemented and help minimize the impact's significance. For dust control, sustainable land clearance practices and rehabilitation and restoration actions will ensure disturbed areas of land are restored/rehabilitated as soon as possible to minimize dust generation. GIIP for vehicle management, including demarcated access routes, speed limits, well-maintained vehicles, and siting of generators away from receptors) will reduce the potential impact of gaseous emissions to acceptable levels. Regular daily visual monitoring of dust episodes, soiling of vegetation, dust resuspension on the roads and dust clouds will also help ensure the significance of fugitive dust and gas emissions are managed to acceptable levels. Design measures to route the OHTL and access routes at least 250 m from sensitive receptors will help to minimize any impacts. GIIP for noise management includes restricting works to daytime hours and locating all temporary worksites more than 250 m from sensitive receptors (specifically the canal, herder camps, and good vehicle management practices (e.g., no revving of engines etc.). Combined, these measures ensure that impacts from noise are insignificant. A minimum water protection setback of 70 m will be maintained between the site boundary and the edge of the ABIS canal and a health protection setback of 250 m from residential properties. The residual impact of air quality and noise is reduced to minor (for workers) and neutral (for offsite receptors, including herders).

#### **4.7 Hazardous materials and waste management**

Inadequate handling, transfer and disposal of solid waste, hazardous waste and hazardous materials may lead to uncontrolled releases to land, air, surface water and groundwater, leading to the degradation and pollution of the receiving environment. Most waste generated during construction will be non-hazardous and low-level hazardous wastes (e.g., oils, paints, solvents). These will be disposed of in a regulated landfill that meets national regulations and GIIP. There may also be the potential for asbestos waste from the decommissioning of small parts of the existing overhead line, but this will be checked before works commences so that appropriate precautions for the workers and nearby herders can be put in place. The availability of non-hazardous or construction waste disposal facilities in the local area is good. There is less capacity to dispose of hazardous wastes locally, and wastes will be transported to sites in Bukhara or Tashkent. All prohibited materials that may generate hazardous waste will be banned in project contracts.

A Hazardous materials and Waste Management Plan will be required for each phase of the project to set out the procedures for handling and storing waste and transportation and disposal to an appropriate landfill in line with national laws and GIIP. There will be

limited if any, opportunities for recycling waste or re-using waste (during construction). Weekly and monthly waste generation volumes for construction waste (segregated by waste stream defined by waste disposal option) will be reported.

For operational and decommissioning phase wastes, e.g., PV panels and batteries, the Project will select PV panel producers and battery suppliers to ensure the take-back and recycling of PV panels and batteries during the operation phase and end-of-life decommissioning (following guidance available). The residual impact of construction phase hazardous material and hazardous waste is minor and neutral for general waste. During operation, the residual risk associated with the additional disposal and recycling of main electrical components of the PV plant, BESS, OHTL and substation is considered minor.

#### **4.8 Soils, hydrogeology and groundwater quality**

There is a potential risk of causing contamination of soils and groundwater and deterioration of worker health, particularly during foundation excavation, due to the naturally elevated levels of heavy metals in the soils. In addition, the low vegetation cover of the fixed and semi-fixed sands and low organic matter in the soil makes the site susceptible to increased soil erosion potential. A site clearance plan will set out measures to minimize soil removal and, where possible, support the return of the impacted area to the original state as quickly as possible following the completion of the works. This may require aeration of the topsoil, enrichment of the topsoil or reintroduction of selected species and shrubs. Good practice techniques for retaining and re-using the topsoil will be implemented. GIIP will minimize releases of pollutants to the ground and to surface water. All workers must wear the appropriate PPE for groundwork, including dust masks where appropriate. GIIP for managing potential groundwater contamination risks (e.g., unplanned spills) will also be employed. The residual significance for impact on soils is deemed moderate and minor for contamination risk and risk to worker health.

#### **4.9 Water resource management (including groundwater) and water quality**

Relatively low volumes of water will be required for the construction works. The main water requirement is during cement manufacture, which will be at offsite facilities under the relevant licence. No groundwater or other nearby water sources (ABIS canal or irrigation drainage area and ponds) is planned to be used for construction. Drinking water from a sustainable municipal water source will be tankered to the site. Measures to prevent contamination of surface water from construction works will align with GIIP and include appropriate storage for chemicals, fuels and oils, refuelling in dedicated areas, minimizing increased runoff from work areas, managing cement washout, no direct discharge of contaminated water or potentially contaminated water to surface water. A

mandatory water protection setback of 70 m will always be maintained between the fenceline and the ABIS canal. An additional setback is proposed for the siting of potential sources of contamination (e.g., refuelling area or laydown areas). The residual significance for impact on water resource availability, water quality and groundwater quality are considered minor or neutral.

#### **4.10 Land requirements**

Masdar is committed to avoiding adverse impacts on communities and people using the land for their livelihoods. The Project has followed the requirements of national law and considered how this aligns with the needs of *IFC PS5: Land acquisition and involuntary resettlement*<sup>5</sup>. Significant livelihood impacts are not anticipated at the PV site. No physical displacement impacts have been identified as a result of the Project. The Committee for Sericulture and Wool Industry Development (SWID) owns all of the Project land. The following affected people have also been identified:

- One official agreement for short-term grazing on the Project land between “Alat Qoraqolchilik” LLC and Herders H1 and H2.
- Seven households from the Kirilishon community who use the Project land belonging to the LLC without an agreement in place (informally for grazing during Spring).

A compensation and mitigation package has been identified and agreed upon with the impacted households, including access to alternative grazing land and transitional support. All livelihood restoration measures are outlined in the Project LRP and where compensation is identified, this will be provided before access to the site is lost. All residual impacts are considered minor for Herders H1 and H2 and the LLC. Residual impacts on the seven herders are deemed to be moderate.

#### **4.11 Community health, safety and security**

Several construction activities could potentially impact the local community, including infrastructure and equipment design and safety; unplanned exposure to hazardous materials, the potential for increased exposure to communicable diseases; and potential risks to the local community arising from the Project security arrangements. Interactions with the local community will be managed sensitively. The Project has assessed that the security risk has a moderate impact potential during the construction phase, with other impacts being minor. The project management plans have placed several requirements

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<sup>5</sup> IFC Performance Standard 4: Land acquisition and involuntary resettlement (January 2012)

on the Project Company, Contractor and their sub-contractors to address the potential impacts on the community, including:

- All workers and security personnel must adhere to a worker/security personnel code of conduct.
- To establish and implement a community grievance mechanism for transparently addressing the concerns of community members or other stakeholders.
- Requirement for the Contractor to perform a security risk assessment and develop a Project specific security management plan before work commences.
- Develop an influx management plan to address issues related to worker influx, including GBVH risks.
- Establish an Emergency Preparedness and Response Plan (EPRP).

The use of force by private security is only sanctioned for preventive and defensive purposes in proportion to the nature and extent of the threat. Specific measures for managing security risks include i) requirements to vet security personnel before being hired, ii) the need for clear instructions on how security personnel will respond to an incident; and iii) a protocol for interaction with the public security force. Carrying or using firearms on site will be prohibited at all times.

Overall, the labour workforce requirements are likely to reach 600 workers during the peak of the construction phase. It is not anticipated that the volume of skilled workers from outside Uzbekistan will have an undue impact on the region's existing infrastructure (housing, schools, utilities), or natural resources, and all changes will be short-term and reversible.

There is potential for an increased risk of the spread of communicable diseases and increased rates of illicit behaviour and crime resulting from the worker influx; however, the volume and skilled nature of the incoming workforce reduces this likelihood. All workers will be required to sign a worker's code of conduct and will be made aware of the disciplinary actions that will be taken if behaviour that is not in keeping with the code of conduct is observed. All residual impacts are considered to be minor.

#### **4.12 Traffic and transportation**

Traffic and transportation risks are limited to the construction phase. These risks may include community health and safety risks from the volume of vehicles and traffic-related accidents along the R78 when delivering materials, personnel and equipment to the site. No abnormal loads are required. The traffic impact assessment and consultation have identified the need to manage routing traffic along the R78 between Alat and the site, specifically when travelling through Kirlishon and Kulchovdur communities. The Project will undertake noise monitoring and employ GIIP to minimize traffic impacts, including

restricting vehicle movements to daytime hours, restricting project traffic movements along the R78 to the west of the site, developing a Traffic and Transportation Management Plan and requiring all drivers to adhere to a driver's code of conduct. All residual impacts are considered to be minor or neutral.

#### **4.13 Biodiversity**

The ESIA identified potential for significant impacts in the following areas:

- Terrestrial habitat and flora loss and degradation (permanent and temporary);
- Accidental introduction and dispersal of invasive species;
- Disturbance to terrestrial animal species (e.g., noise, artificial light);
- Injury or death of terrestrial animals;
- Habitat fragmentation; and
- Increase in road kills and injuries to wildlife.

No impact is expected on national or international protected areas and no features were identified as Critical Habitat triggers for the Project as defined by Lender standards. Twenty distinct biodiversity features have been identified as Priority Biodiversity Features (PBFs) or Natural Habitat (NH) features. No significant impact on PBFs or species of conservation importance or Uzbekistan red list species in the Project AOI, including the Goitered Gazelle, Central Asian tortoise, avifauna including the MacQueen's bustard, and two duck species including the White-headed duck, four fish species (including the Shovelnose sturgeon), Central Asian otter, and three red-listed plants. The habitat at the site is considered to be Natural habitat (NH) with three priority biodiversity features (plants): the *Calligonum matteianum*, *C. molle*, and *C. paletzkianum*.

Key mitigation measures include:

- Prepare a Biodiversity Management Plan (including Vegetation Rehabilitation and Restoration Plan for vegetation and plant restoration methods (e.g for *Calligonum matteianum*, *C. molle*, and *C. paletzkianum*); );
- Implement a no net loss for natural habitats by establishing offset and set-aside (elaborated in the Project Biodiversity Management Plan);
- Implement a pre-construction tree counting survey and seed collection and replanting program for the *Calligonum* plant species;
- Chance rescue and relocation plan for the Central Asian Tortoise to be implemented during site clearance (part of the Project BMP);
- Select fencing that allows the free movement of small fauna onto and across the site to support habitat (and soil) restoration goals and limit biodiversity impacts
- Protection of the ABIS canal from dust and water quality (minimum 70 m setback);

- Install bird diverters for new and refurbished sections of OHTL; and
- General good international industry practice.

Residual impacts are all considered to be moderate or below.

#### **4.14 Cultural heritage**

No protected tangible or intangible cultural heritage has been identified in the direct AOI. Above ground investigation by the Institute of Archaeology concluded that the site is not significant from a cultural perspective, and there is a low risk of any finds of cultural or archaeological importance. During excavation, the Institute of Archaeology will oversee the works and support the Project to implement the Project chance find procedure for any unexpected finds during excavation and groundworks. Residual impacts are considered to be minor or neutral significance.

#### **4.15 Decommissioning**

A decommissioning management plan will be prepared to manage environmental and social risks associated with the decommissioning phase. In addition to general decommissioning-related risks identified in the ESIA, a specific focus will be on electrical waste management.

#### **4.16 Other impacts**

Although some other construction activities are near the site, no significant cumulative impacts are expected for this Project. There may be some minor cumulative impact risks related to the influx of more migrant workers, and this will be managed through the Project management system and employment protocol which prioritizes local workers. The worker code of conduct will need to be signed and complied with, and if any conflict will be managed through the Project's disciplinary procedures. No indigenous peoples, as defined by IFC PS7, have been identified in the project area of influence. The Project site is located more than 20 km from the border with Turkmenistan and is considered outside the direct and indirect area of impact and outside the range of temporary project influx and has not been considered in this assessment.

### **5. Mitigation, management and monitoring of impacts**

As part of the ESIA, a framework Environmental and Social Management Plan (ESMP) has been prepared (Volume IV of the ESIA). The ESMP sets out Project-specific mitigation measures arising from the impact assessment process and GIIP. The EPC Contractor will implement the requirements of the ESIA.

The EPC Contractor will adopt the Masdar corporate environmental and social management system (ESMS), and the Project Company will oversee the development, construction, and operational activities of the Project. The ESMS comprises Masdar policies, project assessment documentation, construction environmental and social management system (cESMS), topic-specific management plans, and reporting templates for monitoring progress. The cESMS will be supported by a contractor management system and plans outlining procedures for implementing the requirements of the ESIA and the cESMS. The cESMS framework is aligned with GIIP for environmental, social and health and safety management (i.e. ISO14001:2015 Environmental Management, ISO 26000:2010 Social Responsibility, and ISO 45001 Occupational Health and Safety Management).

Masdar will establish a Project Implementation Team (PIT) as part of the Project Company to oversee the development and construction works in accordance with the MASDAR Policy and cESMS. Once the Project is operational, the responsibility for operations and maintenance works (O&M) and any functional E&S requirements will be transferred directly to the Project Company. In addition, a Project management company (PMC) is appointed by the Company and is involved throughout the construction phase to ensure that the EPC Contractor is adhering to the technical project specifications required. The EPC is also required (as per the ESIA) to appoint a suitably qualified person to oversee the ecological and archaeological requirements of the Project.

The Project management plans will outline GIIP in the following areas as per the findings of the ESIA:

- Discharges to surface water or ground
- Fugitive dust emissions / emissions from project vehicles
- Construction noise (vehicles)
- Waste management (general and hazardous)
- Hazardous materials management
- Spill prevention
- Labour and working conditions
- Occupational health and safety
- Community health safety and security
- Livelihood restoration
- Stakeholder engagement
- Emergency preparedness and response.

The Project will implement the following measures to protect the community and workforce:

- Require all traffic to be managed along R78.
- No vehicles to line up on the regional road.
- Communicate casual or unskilled employment opportunities before starting work to set clear expectations on numbers and reduce the likelihood of opportunistic in-migration.
- Disclose the local hiring policy – which sets out project preference for recruiting from the available local workforce where possible and prioritizing Kirlishon and Kulchovdur communities, herders and women.
- Require all workers and security personnel to sign a “code of conduct”.
- Require all contractors and their subcontractors to adhere to the Project labor requirements, which aligns with national regulation and IFC PS 2 on labor.
- Require all contractors and their subcontractors to adhere to the “labour management plan”, which sets out requirements for contractors, including disciplinary actions.
- Disclose a “community grievance mechanism” and stakeholder engagement program before work commences that sets out how the community can seek remedy for any concerns or grievances concerning the Project.
- House workers from outside the project area or municipality in accommodation away from the immediate community (Kirlishon and Kulchovdur communities), thereby reducing potential social tensions.

The EPC Contractor will be required to implement an EPC-ESMS to oversee the Project's construction activities. The EPC-ESMS will include policies, assessment documentation, and Project-specific management plans, including site plans for waste management, labour management, accommodation, employment, procurement, biodiversity,

Masdar and the EPC Contractor's ESMS will be aligned with the requirements of ISO14001 environmental management and ISO 45001 Occupational Health and Safety management.

## **6. Conclusion**

The overall outcome of the ESIA is that the Project is an effective and viable energy infrastructure project that is central to the transition of the country to renewable power.

In general, the E&S impact from solar PV projects are well understood and can generally be managed to acceptable levels by establishing environment, health and safety, labour, social and security management and mitigation measures implemented through a robust

environmental and social management system and human resources (HR) policy. From a social perspective, livelihood impacts have been assessed, and measures to address these impacts are described in the Livelihood Restoration Plan.

The Project is considered suitable for development and able to comply with national and Lender requirements. The measures identified in the ESIA enable the Project to avoid, or where avoidance is not possible, minimize, mitigate or compensate for adverse environmental or social impacts and issues to workers, affected communities, and the environment, including priority biodiversity features and natural habitats (as defined by Lender guidance). All commitments, obligations and statutory requirements will be monitored over the duration of the Project and reported regularly.

## Glossary of Terms

<b>Term</b>	<b>Definitions</b>
Area of Influence (AOI)	The area over which the impacts of the Project are likely to be felt as well as any reasonably foreseen unplanned developments induced by the Project or cumulative impacts
Associated facilities	Facilities that are not funded as part of the project and that would not have been constructed or expanded if the project did not exist and without which the project would not be viable
Baseline surveys	Gathering of data to describe the existing physical, biological, socioeconomic, health, labour, cultural heritage, or any other variable considered relevant before project development
Biodiversity	Variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species, and of ecosystems
Chance find	Archaeological or cultural sites and artefacts, including such items as ceramics, tools, buildings, burials, etc., previously unrecognized in baseline studies that are discovered during exploration activities
Consultation	Consultation is a two-way process of dialogue between the project company and its stakeholders. Stakeholder consultation is about initiating and sustaining constructive external relationships over time
Critical habitat	Either modified or natural habitats supporting high biodiversity value, such as habitat required for the survival of critically endangered or endangered species
Cultural heritage	Defined as resources with which people identify as a reflection and expression of their constantly evolving values, beliefs, knowledge and traditions
Cumulative impacts	The combination of multiple impacts arising from existing projects or activities, and/or anticipated future projects or activities
Direct area of influence	Considers the physical footprint of the projects such as the right of way, construction sites, work staging area and area affected during operational works (e.g., traffic patterns)
Effluent	Wastewater - treated or untreated- that flows out of a treatment plant, sewer, or industrial outfall
Emission	Pollution discharged into the atmosphere from smokestacks, other vents, and surface areas of commercial or industrial facilities; from residential chimneys; and from motor vehicle, locomotive, or aircraft exhausts

<b>Term</b>	<b>Definitions</b>
Environmental and Social Impact Assessment (ESIA)	A forward-looking instrument that can proactively advise decision-makers on what might happen if a proposed activity is implemented. Impacts are changes that have environmental, political, economic, or social significance to society. Impacts may be positive or negative and may affect the environment, communities, human health and well-being, desired sustainability objectives, or a combination of these
Environmental and Social Management Plan (ESMP)	Summarises the company's commitments to address and mitigate risks and impacts identified as part of the ESIA, through avoidance, minimization, and compensation/offset, and monitor these mitigation measures
Environmental and social management system (ESMS)	Part of the Project's overall management system that includes the organizational structure, responsibilities, practices and resources necessary for implementing the project-specific management program developed through the environmental and social assessment of the Project
Good International Industry Practice (GIIP)	Exercise of professional skill, diligence, prudence, and foresight that would reasonably be expected from skilled and experienced professionals engaged in the same type of undertaking under the same or similar circumstances globally or regionally. The outcome of such exercise should be that the project employs the most appropriate technologies in the project-specific circumstances
Grievance mechanism	Procedure provided by a project to receive and facilitate resolution of affected communities' concerns and grievances about the project's environmental and social performance
Habitat	Terrestrial, freshwater, or marine geographical unit or airway that supports assemblages of living organisms and their interactions with the non-living environment
Hazardous waste	By-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. Substances classified as hazardous wastes possess at least one of four characteristics—ignitability, corrosivity, reactivity, or toxicity— or appear on special lists
Indigenous peoples	Defined by the World Bank E&S Framework as a distinct social and cultural group possessing the following characteristics in varying degrees: (a) Self-identification as members of a distinct indigenous social and cultural group and recognition of this identity by others; (b) Collective attachment to geographically distinct habitats, ancestral territories, or areas of seasonal use or occupation, as well as to the natural resources in these areas; (c) Customary cultural, economic, social, or political institutions that are distinct or

<b>Term</b>	<b>Definitions</b>
	separate from those of the mainstream society or culture; and (d) A distinct language or dialect, often different from the official language or languages of the country or region in which they reside
Indirect area of influence	Includes area which may experience project related changes in combination with activities not under the direct control of the project
Information disclosure	Disclosure means making information accessible to interested and affected parties (stakeholders). Communicating information in a manner that is understandable to stakeholders is an important first and ongoing step in the process of stakeholder engagement. Information should be disclosed in advance of all other engagement activities, from consultation and informed participation to negotiation and resolution of grievances. This will make engagement more constructive
Intangible cultural heritage	According to the 2003 UNESCO convention for the safeguarding of intangible cultural heritage, manifestations of intangible cultural heritage include: Oral traditions and expressions, including language; Performing arts; Social practices, rituals and festive events; Knowledge and practices concerning nature and the universe
Land acquisition	All methods of obtaining land for project purposes, which may include outright purchase, expropriation of property and acquisition of access rights, such as easements or rights of way
Livelihood	Full range of means that individuals, families, and communities utilize to make a living, such as wage-based income, agriculture, fishing, foraging, other natural resource-based livelihoods, petty trade, and bartering
Magnitude	The assessment of magnitude is undertaken in two steps. Firstly, the magnitude of potential impacts associated with the Project are categorized as beneficial or adverse. Secondly, the beneficial or adverse impacts are categorized as major, moderate, minor or negligible based on consideration of several parameters
Modified habitat	Land and water areas where there has been apparent alteration of the natural habitat, often with the introduction of alien species of plants and animals, such as agricultural areas
Natural habitat	Land and water areas where the biological communities are formed largely by native plant and animal species, and where human activity has not essentially modified the area's primary ecological functions

<b>Term</b>	<b>Definitions</b>
Occupational health and safety	The range of endeavours aimed at protecting workers from injury or illness associated with exposure to hazards in the workplace or while working
Project affected people	Individuals, workers, groups or local communities which are or could be affected by the project, directly or indirectly, including through cumulative impacts
Renewable energy	Energy sources derived from solar power, hydro, wind, certain types of geothermal, and biomass
Sensitivity	The sensitivity of a receptor is determined based on the review of the population (including proximity / numbers / vulnerability), presence of biological features of the site and the surrounding area, soil, agricultural suitability, geology and geomorphology, proximity of aquifers and watercourses, existing air quality, presence of any archaeological features etc
Significance	Significance of impact considers the interaction between the magnitude and sensitivity criteria
Solid waste	Material with low liquid content, sometimes hazardous. Include municipal garbage, industrial and commercial waste, sewage sludge, wastes resulting from agricultural and animal husbandry operations and other connected activities, demolition wastes and mining residues
Stakeholders	Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project or the ability to influence its outcome, either positively or negatively
World Bank Group EHS Guidelines	Technical reference documents for environmental protection and set out industry-specific examples of 'international good practice'. Projects are expected to comply with the levels and measures identified in the General EHS Guidelines where host country requirements are less stringent or do not exist