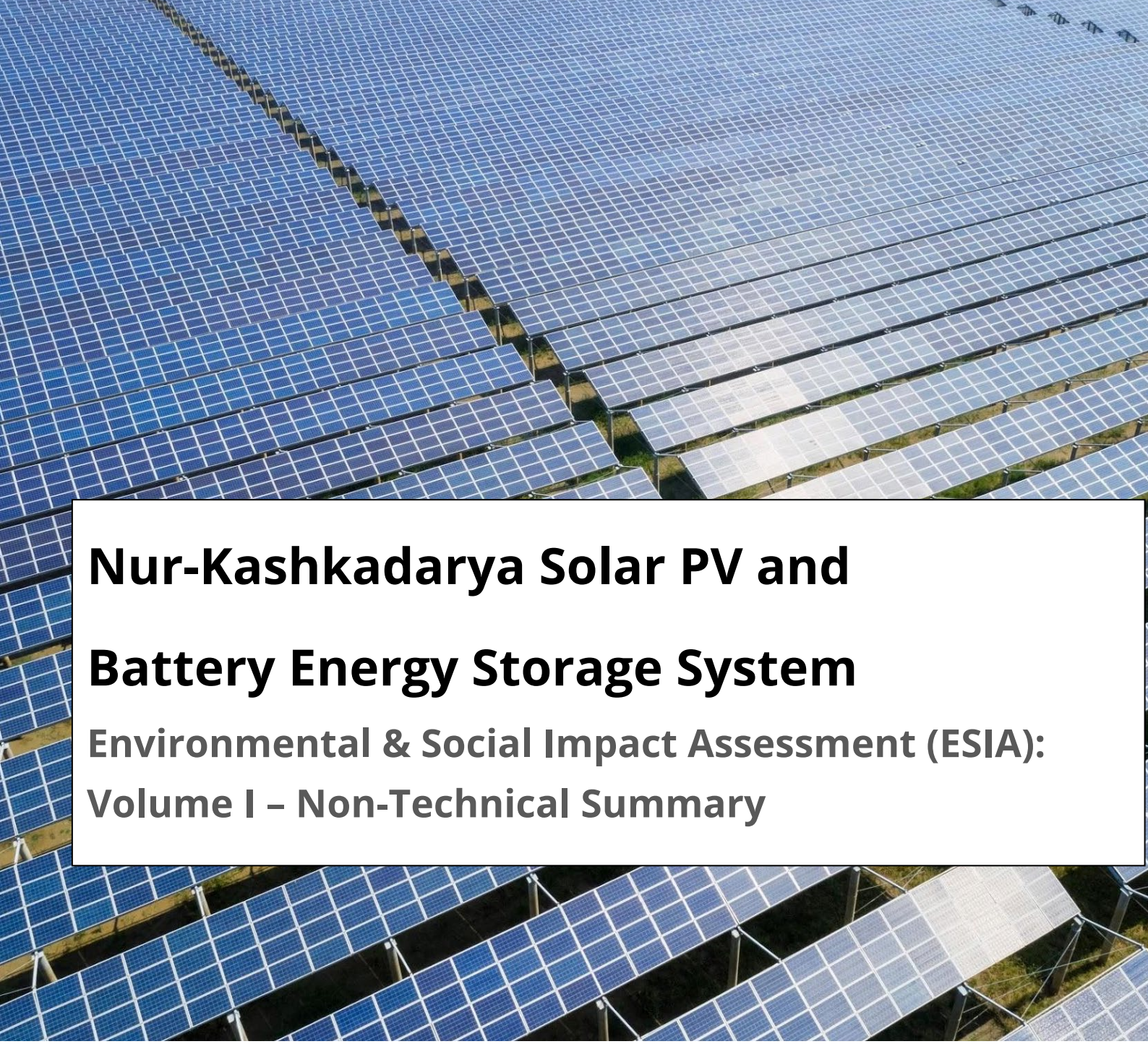


Nur-Kashkadarya Solar PV and Battery Energy Storage System

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

Consulting Firm:

Juru

Juru Energy Ltd
Suite 1, One George Yard, London,
United Kingdom, EC3V 9DF
www.juruenergy.com

Prepared for:

MASDAR

Masdar Clean Energy
Khalifa City A,
Abu Dhabi, UAE, P.O. Box 54115
www.masdar.com

Document Information

Project Name	Nur-Kashkadarya PV Project
Document Title	Environmental & Social Impact Assessment (ESIA): Volume I – Non-Technical Summary
Juru's Project Reference	UZB-MAS-Guzar PV&BESS ESIA
Client	Masdar Clean Energy
Juru's Project Manager	Nicola Davies
Juru's Project Director	Jushkinbek Ismailov

Document Control

Version	Date	Description	Author	Reviewer	Approver
1.0	July 2024	Draft ESIA: Volume I – NTS (for disclosure)	Various	Marianne Lupton	Nicola Davies
2.0	August 2024	Draft ESIA: Volume I – NTS (updated post disclosure)	Various	Marianne Lupton	Nicola Davies
3.0	August 2024	Draft ESIA – updated to include client comments (comments tracker 22/08/2024)	Various	Marianne Lupton	Nicola Davies
4.0	October 2024	Final Draft for disclosure – updated to address Lenders comments	Various	Marianne Lupton	Nicola Davies
4.1	November 2024	Section 4.15 and residual significance in section 4.13.	Various	Marianne Lupton	Nicola Davies
4.2	05 March 2025	Final Draft addressing all Lender Comments	Various	Marianne Lupton	Nicola Davies

Disclaimer

The Non-Technical Summary Report (the "Report") has been prepared by Juru Energy. Whilst the information contained in the Report reflects the current status, Juru Energy makes no representation or warranty, express or implied, as to the accuracy of the information set forth in this Report and accepts no liability for any information that may have been misstated or omitted.

This report has been prepared exclusively for Masdar. Masdar makes no representation or warranty, express or implied, as to the accuracy or completeness of the information set forth in this Report. Masdar has not independently verified any of the information contained in this Report and accept no liability whatsoever for any information, misstatement or omission contained therein. The Report remains Masdar property.

Table of Contents

Table of Tables

Table of Figures

Acronyms

Acronym	Definition
ADB	Asian Development Bank
AOI	Area of influence
BESS	Battery energy storage system
BFD	Bird Flight Diverter
CC	Civil Code
CLO	Community liaison officer
DBFOMT	Design, build, finance, construct, commission and operate, maintain and transfer
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
EPRP	Emergency preparedness and response plan
ESAP	Environmental and Social Action Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environment and Social Management Plan
ESP	Environmental and Social Policy
GBVH	Gender-Based Violence and Harassment
GHG	Greenhouse gas
GIIP	Good International Industry Practice
GM	Grievance mechanism
HSSE MS	Health, Safety, Social and Environmental Management System
IFC	International Finance Corporation
ILO	International Labor Organisation
JE	Juru Energy
LRP	Livelihood restoration plan
LLC	Limited liability company
MNR	Ministry of Natural Resources
MP	Management plan
NEGU	National Electric Grid of Uzbekistan
NTS	Non-technical summary
O&M	Operations and maintenance
OHS	Occupational Health and Safety
OHTL	Overhead transmission line
PBF	Priority Biodiversity Feature
PPA	Power purchase agreement
PPE	Personal protective equipment
PR	Performance Requirement
PS	Performance Standard
PV	photovoltaic
ROW	Right of Way
SEP	Stakeholder engagement plan
SPZ	Sanitary protection zone

Acronym	Definition
SWID	Sanitary Epidemiological Wellbeing Departments
UN	United nations

Please note that a glossary containing several definitions is provided at the end of the document.

PREFACE

Mission "To be a global clean energy developer with a reputation as the partner of choice. We meet the needs of clients and communities alike"

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-Kashkadarya Solar photovoltaic (PV) Project with a capacity of 300 MW_A and 75 MW/75 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-Kashkadarya Solar PV LLC Foreign Enterprise and JSC National Electric Grid of Uzbekistan ("NEGU"). Masdar has appointed Juru Ltd. ("Juru" 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 ESIA was undertaken in July 2024 via public meetings and group meetings with responsible organizations, land users, and people from the nearest communities to the Project. The disclosure communicated the findings of the draft ESIA. In addition, brochures have been left with stakeholders. Copies of the final NTS in English, Russian and Uzbek (this document) have been placed for viewing at:

- Guzar and Kamashi Khokimyats
- Aynakul, Batosh, Yangiabad and Khalkabad community offices

Questions or comments can also be addressed via the channels outlined below.

Company	Contact Details
Juru Energy Viktoriya Filatova – Senior Environmental Consultant	Email: o.khegayv.filatova@juru.org Telephone: +998 71 202 044090 941 43 71
Juru Energy Zarina Gafurova – Social Consultant	Email: z.gafurova@juru.org Telephone: +998 90 935 74 48
Project company CLO TBC	Email: Telephone:
Project Company Gross Plaza Business Center, 21A, Taras Shevchenko Street, Mirobod District, Tashkent, 100060, Republic of Uzbekistan **Phone number:** +998978686860	

1. Introduction

1.1 Overview of the Project

The Nur-Kashkadarya Solar Photovoltaic (PV) Project with a capacity of 300 MW_A and a 75 MW Battery Energy Storage System ("Project"). The Project includes an approximate 1,578-metre grid connection to the existing 220kV/500kV Guzar substation adjacent to the site via a combination of an overhead transmission line (OHTL) and underground cable. There are no associated facilities for the Project as defined by Lender standards.

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), European Bank for Reconstruction and Development (EBRD) Environmental and Social Policy 2019 (ESP 2019) Performance Requirements (PRs), and with reference to the Equator Principles IV (referenced in the remainder this NTS as the Lender standards).

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 (including environmental and biodiversity baseline reports, human rights impact assessment and climate change risk assessment).
- Volume IV: Environment and social management plan (ESMP)
- Volume V: Stakeholder engagement plan (SEP), including grievance mechanism (GM)
- 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. In Uzbekistan, Masdar has a 100 MW utility-scale PV solar

plant in operation and another 2,600 MW of projects under various stages of development. Masdar will establish a Project Company (Nur-Kashkadarya 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 300 MW of power supply to the national grid (plus 75MW storage capacity)
- Reduce energy dependence on carbon-based fuels and reduce greenhouse gas emission rates.
- Meet renewable energy targets.

2.2 Alternative options

Alternative concepts, layouts 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. The original site selection was undertaken with support from international consultants as part of preparations for the Project auction. The site was further optimized during the ESIA process to avoid as far as possible interfaces (crossings) with existing utility services that cross the site and to provide the best balance between maximizing generation output and minimizing impacts on landowners, existing mining concessions and other features such as ephemeral drainage channels which although within the Site boundary will be avoided by Project infrastructure.

In all cases mandatory sanitary protection zones (SPZ or setbacks) for residential buildings have been maintained as follows: (OHTL - 60m total SPZ, and gas pipeline - 300m SPZ).

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 (including PV infrastructure, BESS, access road and grid connection) is 733-ha immediately adjacent to the existing 220kV/500kV Guzar substation. The Project is located in the Guzar and Kamashi districts (55 km south-west of Shahrisabz and 12 km northeast of Guzar cities in Kashkadarya regions) of Uzbekistan. Immediately parallel to the site's northern boundary is the regional road M39, which runs between Shahrisabz and Guzar. To the west is the existing 220kV/500kV Guzar substation. A water pipeline ("Yakkabog-Guzor") operated by Kashkadarya Uzsuvtaminot runs parallel to the M39 and must be crossed during the access road construction. An existing gas pipeline must be crossed by the grid connection (OHTL) and the new access road. All crossings will be performed in accordance with the specifications of the relevant responsible authorities which can be found in the ESIA Appendices.

The nearest communities are Yangiabad, Khalqabad, and Batosh from Guzar district and Aynakul from Kamashi district (Figure 1, Figure 2, Figure 3).

Figure 1: Project Location

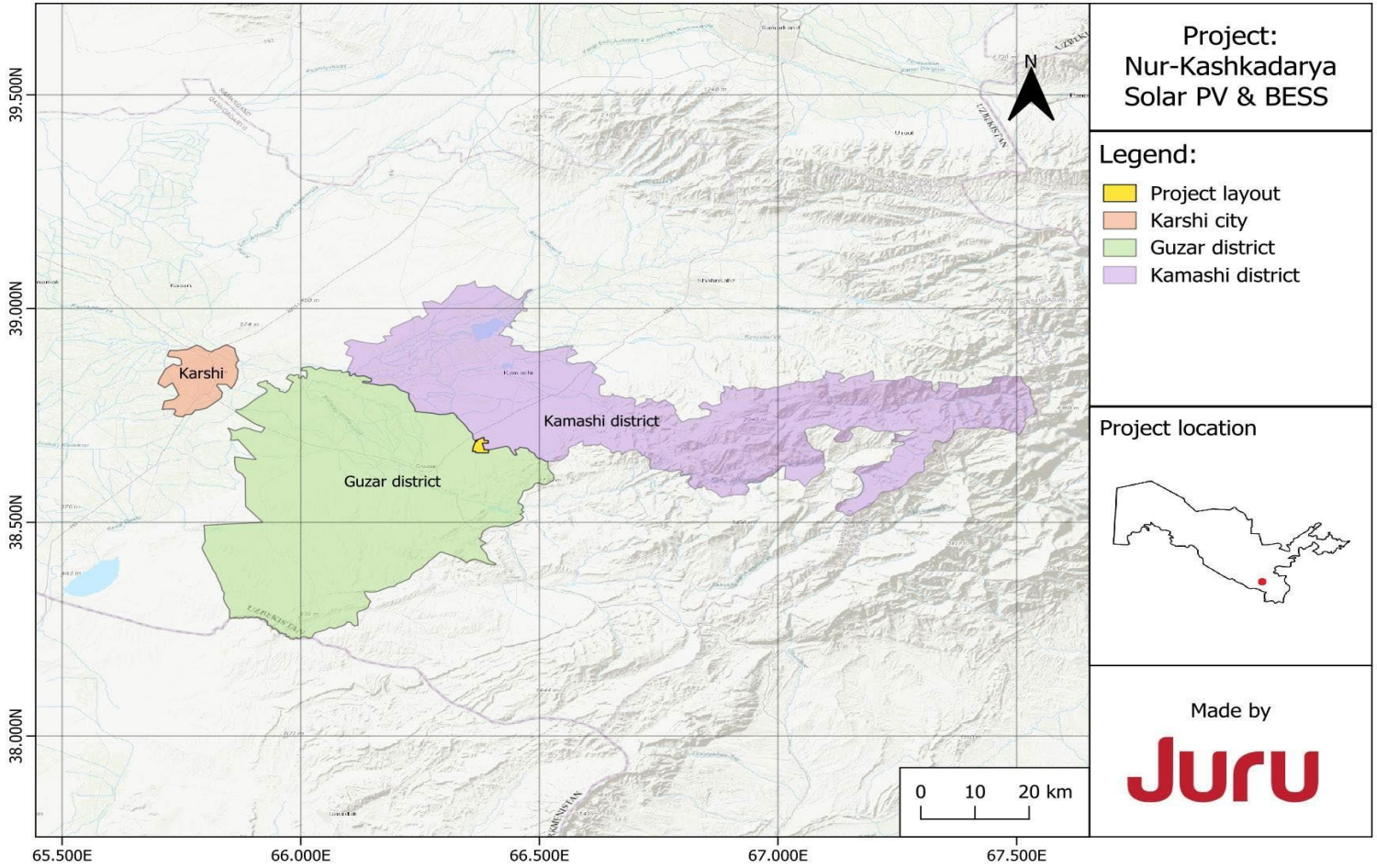


Figure 2: Project setting (aerial photo view)

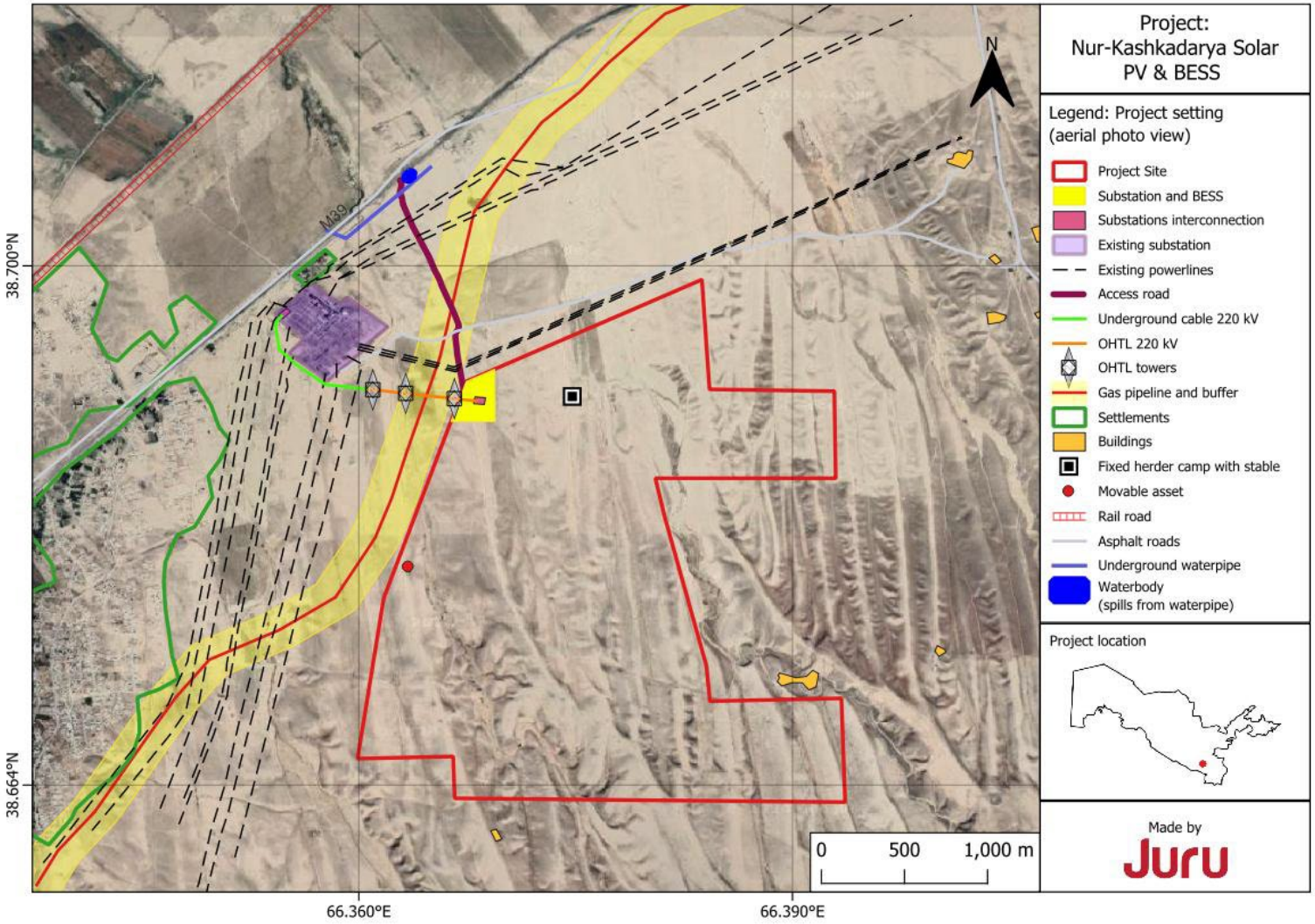
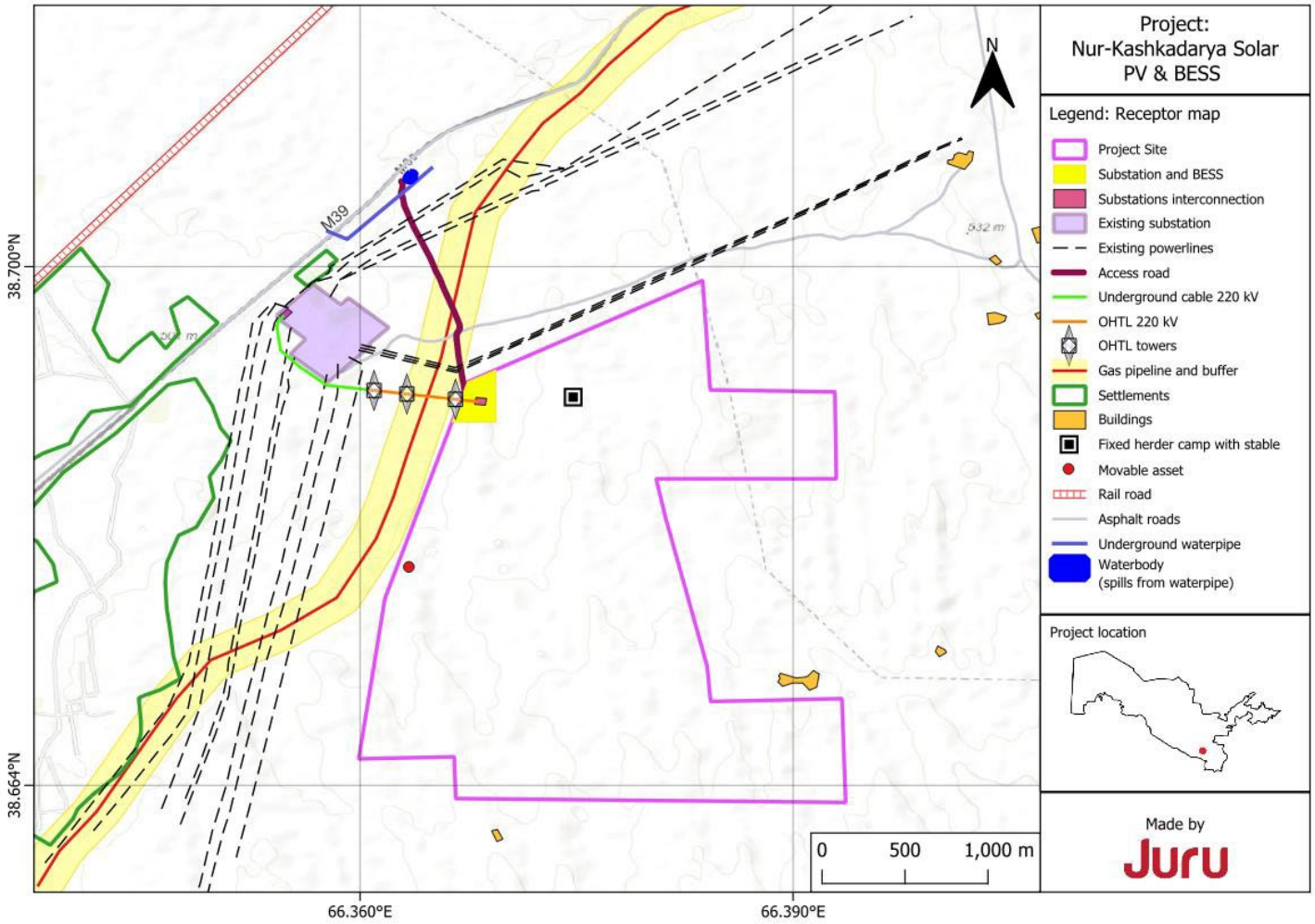


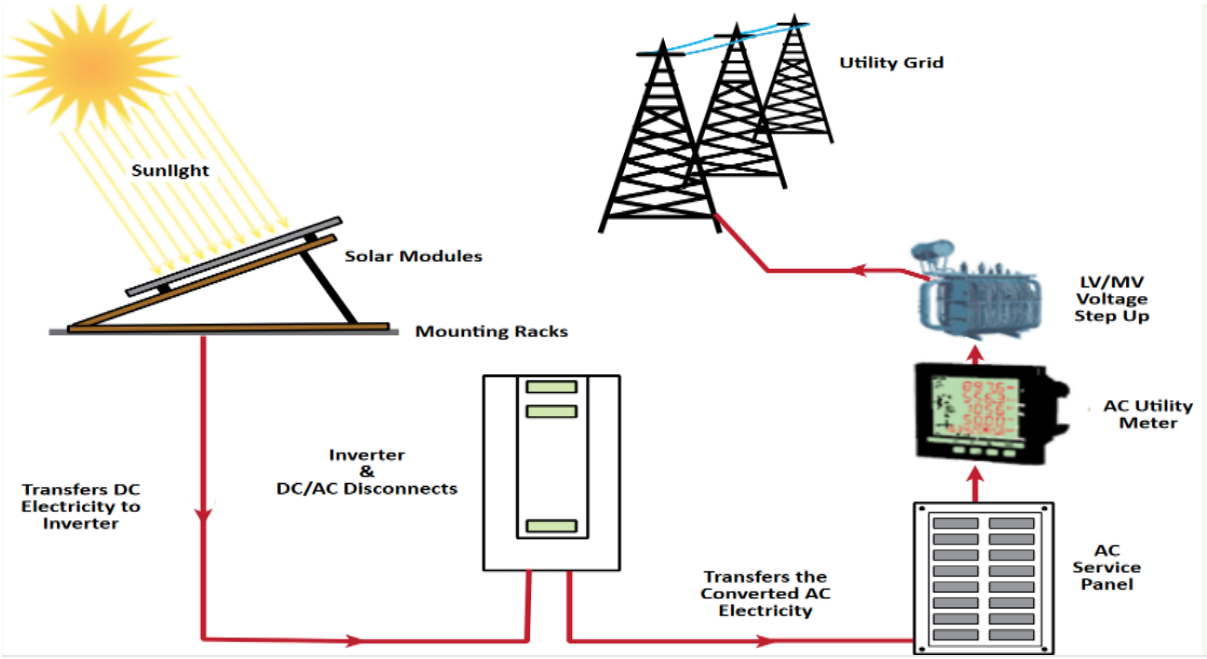
Figure 3: Project setting (map view)



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 4 below.

Figure 4: Overview of the PV process (compiled from IFC, 2015[1])



The main components of the Project are:

- 578,088 PV modules (half-cut monocrystalline silicon technology);
- Single-axis tracker, inverters and transformers;
- Lithium-Ion phosphate (LFP) battery energy storage system (BESS) consisting of 27 containers);
- 220 kV connection to the existing "Guzar 500kV substation" via a combined OHTL and underground cable from the west of the site to the northwest side of the

[1] Utility-Scale Solar Photovoltaic Power Plants: A Project Developer's Guide

substation (a total of 1,578 m in length: 658 meters for OHTL and 915 meters for underground cable)

- New 35/220 kV substation with two transformers;
- On-site buildings, including an operational control centre, office, welfare facilities, security guard house, storage facilities and stores;
- New access road from Highway M39 (crossing the "Yakkabog-Guzor" water pipeline);
- Natural site drainage system.

Figure 5 to Figure 8 illustrate the typical project components.

Figure 5: PV panels

Figure 6: PV tracking system and inverters (Single-axis trackers follow the sun east-to-west on a single point. NEXTracker)

Figure 7: Battery container (internal)

Figure 8: Typical container BESS (external)[2]:

[2] https://energycentral.com/c/cp/large-battery-energy-storage-systems

2.5 Project activities

The following activities will be undertaken to develop the Project:

- Mobilization phase
  - Transportation of civil construction materials to the site
  - Establish laydown and possible customs area for storing materials.
  - Recruitment of local workforce/services.
  - Identification of local materials and suppliers.

- Site set up
  - Preparation of temporary accommodation facility (if required[3])/ Identiicaiton of offsite housing needs in existing accommodation
  - Procurement
  - Construction phase - civil works
  - Secure site
  - Construct main access road and internal access roads

- Site clearance/excavations
  - Vegetation clearance
  - Foundation works (including delivery of cement)
  - Cabling excavations (220kV underground cable and internal low voltage cable trenches)
  - OHTL tower excavations (tower foundation)
  - Transportation of abnormal loads and materials to the site
  - Construction of operations building stores and maintenance yard
  - Enabling work

- Construction phase - mechanical and electrical works
  - PV/BESS infrastructure installation
  - Excavation for placement of tracking system
  - Construction of SS
  - Installation of SS equipment
  - Installation of OHTL towers
  - Commissioning

[3] At this time, it is expected that workers will be housed in existing accommodation in the wider Project area (Guzar and further afield), local community of Yangiabad, Khalkabad, Batosh and Aynakul and purpose built offsite temporary accommodation (location to be determined). No temporary accommodation facility is planned at this time, but this will be confirmed by the selected construction contractor.

- Operation phase
    - Operation of PV / BESS project.
    - Day-to-day maintenance
    - Periodic/planned maintenance
    - Monitoring

- Decommissioning phase (construction)
    - Reinstatement of excavated areas
    - Removal of construction materials
    - Rehabilitation of temporary storage and accommodation areas

Construction of the Project will be confined to the Project site, access road right of way (ROW) and existing grid connection ROW. However, if this changes for any reason, they could take up additional land temporarily during the construction stage. The temporary land take areas will be estimated during detailed engineering design and a suitable site will be identified for this purpose. The Project Company will seek to enter into a direct transaction agreement for the rental of this land. No compulsory use rights will be enforced in relation to this land.

The main construction activities are site clearance (rocks, utilities, vegetation), establishing vehicle access, civil works (grid connection, substation and main site), equipment delivery of PV panels and supporting infrastructure, BESS, installation and commissioning. The duration will be approximately 12 to 18 months. Site establishment and civil works are expected to commence in December/January 2025 and take four months, followed by eight to twelve months of construction and commissioning, targeting commercial operation in Spring 2026.

A material storage area will be established within the main site boundary where possible, should any additional temporary land be required e.g. for laydown area, this will be rented through a direct agreement with the landowner/land user. The water needed for the construction process will be from the Guzar municipal water supply, which will be delivered by tanker to the site and stored in short-term storage tanks.

Although not planned at this time, Contractors and subcontractors will be allowed to rent offsite accommodation following a process of selection which will be described in the Labor and Working Conditions Management Plan and provided it meets the requirements of the "Worker's Accommodation Processes and Standards": Guidance Note by IFC and EBRD and adheres to the management and measures stipulated in this ESIA. Contractors may develop on-site temporary purpose-built accommodation, but this is not envisaged at this time, although it is considered in the ESIA. While accommodation

outside the local villages is preferred, using accommodation in the local villages is not prohibited as along as it meets the requirements of the IFC/EBRD Guidance note on accommodation standards and the relevant consultation is performed with the social departments at the Guzar and Kamashi municipalities and community leaders in advance.

The expected lifetime of the PV and BESS infrastructure is 25 years, and ten years for the BESS. At the end of its design lifetime, options will be considered to replace, repair, or remove all infrastructure from the site or transfer to NEGU. Following construction, the OHTL and cable will be transferred to NEGU for operation and maintenance activities.

2.6 Land requirements

The Project will not result in any physical displacement impacts. There will be a permanent land take totalling 733.09 ha incorporating:

- 731 ha for the Project PV Site,
- 0.028 ha for the tower footprints
- 0.362ha for the cable route (including a 1 m security setback on each side)
- 1.7 ha for the access road (based on approximately 1,700 m long road with 10 m ROW). This land will be leased to the Project's SPV.
- Temporary land take impacts in relation to the construction of the OHTL during the construction phase of 1.67ha of land (~698 m with a 30 m setback either side of the conductor).

Overall, 9 farms were identified (owned by 8 farmers) along with their workers and the herders that herd animals the farms, that will be economically displaced by the Project. They are described as follows:

- 7 farms, 1 PE and 1 LLC (F01-F09) are all considered farms (two farms F03 and F08 are owned by the same PAH);
- 22 workers (8 seasonal workers and 14 permanent workers who graze their own and other people's livestock on the land).
- 4 herders who use the land to graze owned and rented livestock at the Project site).
- 22 livestock rental households (LRHs) (that rent animals to other PAPs)

165 people from 28 households (farmers, workers and herders) are going to be impacted by the Project. In addition, three structures, a herder shelter, a stable for livestock and a mobile trailer will be removed.

The livelihood impact assessment and the livelihood restoration plan (LRP) consider the impact on the above receptors and has developed a compensation plan to be delivered before the start of construction aligned with national laws and Lender standards (PS5, PR5 and ADB SR2). Compensation will be required for the land acquisition impacts, particularly for farmers, and livelihood restoration measures are outlined in the Project LRP to address loss of employment by farm workers, loss of access to land by workers to rent animals for grazing, and of access to land by herders. If additional temporary land is required in the future, the location of this land will be determined based on the land entry procedure within the Project's Health, Safety, Social and Environmental Management System (HSSE MS). All activities under this additional land will be required to adhere to the requirements of the existing Project.

2.7 Labour requirements

The total workforce required during the peak construction period could reach approximately 600 workers (made up of skilled expatriate workers and semi-skilled and non-skilled local workers, with an average of 200 workers per day across the project duration. 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 summarises the key milestones for the ESIA and the Project.

Table 1: Project schedule

Activity	Date
Scoping	September 2023
Consultation on national EIA	October 2023- July 2024
Submission of national EIA	End-August 2024
Submission of draft ESIA	End-August 2024
Finalise ESIA	March 2025
Finalise ROW and land agreements / compensation	May 2025
Limited notice to proceed (NTP)	June 2025
Financial close	July 2025
Notice to Proceed	August 2025
Commercial Operation Date	December 2026
Expected Lifetime	25 years for PV; 10 years for BESS

Note: For clarity, early site mobilization includes the construction of 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.

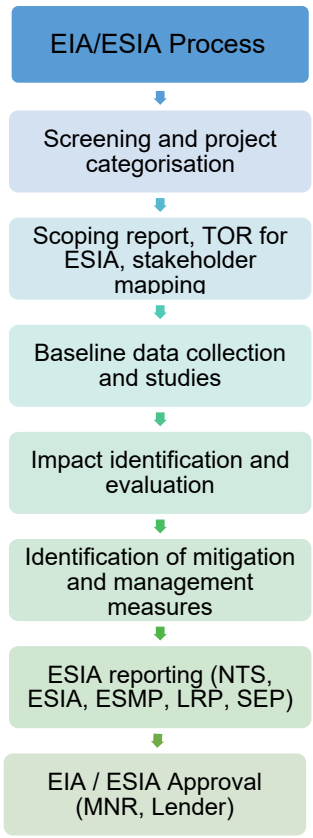
3. Assessment Approach

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), EBRD Performance Requirements (PRs) 2019 and Equator Principles IV. Reference has also been made to the World Bank Group Environment, Health and Safety (EHS) Guidelines (General), international environmental conventions, core labour conventions of the International Labour Organisation (ILO) and United Nations (UN) and Good International Industry Practice (GIIP). Under the IFC PSs,

ADB SPS 2009 and EBRD PRs, we consider this Project Category B. No associated facilities as defined by Lender standards are identified.

Under Uzbek law, the Project is considered to be a Category I project and 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 is required to be submitted to Ministry of Ecology, Environmental Protection and Climate Change (MEEPCC). A positive conclusion on the Stage I and Stage II of the National EIA was received on August 30, 2024.



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

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, cultural, human or biological) as defined by the baseline studies and data collection. This ESIA and its supporting documentation are prepared following the steps outlined in Box 1. The size (also referred to as magnitude) of the impact considers:

- type and nature of impact (positive/negative)
- spatial extent (e.g., local, regional, global)
- duration (continuous/temporary)
- 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 impractical or 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 decision-making.
- 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 archaeological impacts supported by a detailed intrusive archaeological investigation, physical impacts, e.g., noise, air quality, soils and social impacts, e.g., livelihoods, worker influx, supply chain, community health and safety, employment and labour rights and worker welfare. Ecological impacts have also been assessed, but the Project site is not considered an area of high conservation priority due to the past and ongoing agricultural activity.

Mitigation, management and monitoring measures identified in the ESIA have been included in a framework ESMP (Volume IV), which outlines a framework across the different phases of the development cycle. The Owner and the EPC Contractor will also develop a set of standalone topic management plans to expand on 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(including vulnerable groups) and other interested groups (collectively known as stakeholders). A systematic stakeholder engagement (SE) approach 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). SE started in February 2023 with a scoping site visit and will continue throughout the Project's lifetime (i.e. construction, operation and decommissioning).

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

- Meetings with farmers to inform of land take requirements ahead of the compensation disclosure process (May 2025).
- Disclosure of the NTS in Project districts (eight hard copies of the NTS in Uzbek were provided to each of the local government offices of the four AOI communities and two Municipalities)
- ESIA public meetings to disclose the findings of the draft ESIA (July 2024).
- EIA public hearing (July 2024).
- Letters to government bodies (national, provincial, municipal and district departments/khokimiyats), including the Guzar municipality cadastral and Kamashi municipality cadastral departments (February 2024 and ongoing based on layout changes).
- Letters and meetings with:
    - Regionally based industries, community leaders
    - Project-affected communities (PAC) (Yangiabad, Khalqabad, Batosh and Aynakul communities)
    - Yangiabad, Khalqabad, Batosh and Aynakul community representatives
    - Formal land users (Kamashi District Municipality, SWID Committee, Leaseholders (7 farms, 1 LLC) ;
    - Informal land users;
    - Sanitary Epidemiological Wellbeing Departments of Guzar and Kamashi districts
- Focus groups with women

- Focus groups informal land users (herders)
- Letters to Guzar District Khokimiyat, Kamashi District Khokimiyat, Institute of Botany, Cultural Heritage Agency, Ministry of Geology, Ministry of Cultural Heritage Institute of Archaeology and SWID.

The Draft and Final ESIA documentation will also be disclosed on the Project Company and Lender websites for further comment.

The following figures depict some of the activities performed.

Figure 9: Local worker, Aynakul community

Source: Juru

Figure 10: Yangiabad community members

Source: Juru

Figure 11: Batosh community members

Source: Juru

Figure 12: Guzar District Khokimiyat

Source: Juru

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 – the possibility for this was explained through clarification of the site's location and what options may be possible.

- Availability of employment opportunities – it was explained that jobs will be prioritized for local community members where possible.
- A wish for constant communication with the community during construction – it was explained that the Project will deploy a community liaison officer (CLO) to communicate with the local communities during construction and operations.
- Likelihood of options to improve water and other community infrastructure opportunities – Masdar has taken 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 (GM)

Any concerns, issues, or questions ("grievances") stakeholders may have can be raised to the Project via the GM. The Stakeholder Grievance mechanism is considered part of the Project's HSSE MS that will be implemented during the construction phase of the Project. 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 and in Table 3 at the end of this section. Stakeholders have been continuously informed about the grievance mechanism in subsequent consultations. Contact details to access the grievance mechanism have been included below.

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

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

- Directly to Project staff and security guards 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 Khokimiyat offices, the community offices of Batosh, Aynakul, Khalkabad, and Yangiabad and at the Project gate (once construction starts)

- Via Masdar website.

The GM keeps **strict data confidentiality, including all applicants' personal information**. 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. Project-related GBVH grievances may also be submitted via the methos listed above however they will be routed to specialist GBVH Grievance Redress Committee for investigation and survivor support.

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 (this responsibility will be transitioned to Masdar's CLO or Grievance Manager following the ESIA phase). The grievance form is prepared based on the identified stakeholders' location, language preferences, and communication opportunities. 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. An appeal may be submitted if the complainant is unhappy with the response. Furthermore, submitting a grievance through the GM will not preclude a complainant 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

Stage	Timeline
Receipt and registration of grievance	Day 0
Providing acknowledgement of grievance receipt to the complainant	Maximum three working days after submission of grievance
Assessment/investigation of the received grievance	Maximum 10 working days after provision of acknowledgement of the grievance.
Providing the complainant with a response	Maximum three working days after assessment has been completed
Reassessment of grievance in case the complainant is not satisfied with the previously provided response	Maximum 10 working days 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. If the grievance cannot be resolved at the Project level it might be referred to the Grievance Committee[4].

Table 3: Contact details for raising a grievance

Company	Contact Details
Juru Energy - Viktoriya Filatova – Senior Environmental Consultant	Email: o.khegayv.filatova@juru.org Telephone: +998 71 202 044090 941 43 71
Juru Energy - Zarina Gafurova – Social Consultant	Email: z.gafurova@juru.org Telephone: +998 90 935 74 48
Project company CLO - TBC	Email: Telephone:
EPC Contractor Contact Details - TBC	Email: Telephone:
Project Company Gross Plaza Business Center, 21A, Taras Shevchenko Street, Mirobod District, Tashkent, 100060, Republic of Uzbekistan **Phone number:** +998978686860	

[4] The Grievance Committee will be convened by the Masdar CLO and/or Grievance Manager a will contain persons relevant to the topic of the grievance, likely to include the Project Site Manager, the local Mahalla leader, male and female representatives from the local mahalla and local authorities (relevant to the grievance raised).

4. Summary of environmental and social assessment

4.1 Overview

Potential impacts over a potential area of impact (AOI) defined for each topic have been assessed, and the residual risk has been evaluated based on the proposed mitigation measures set out in the ESIA. The ESIA has assigned all residual impacts a moderate or low significance level.

Table 4: Risks and impacts assessed in the ESIA

Environment and Health	Social	Labour
• Air quality (C/D). • Noise and vibration (C/D) • Waste (including hazardous waste) (C/O/D) • Climate resilience • Soil and geology (C/D) • Water resources (C/D). • Hydrogeology (inc. flood risk) (C/D) • Biodiversity (habitat loss, impact on critical habitat and PBF) • Cumulative impacts (C) •	• Community health and safety (C/O/D) • Traffic and Transportation (C/D) • Security (C/D) • Emergency preparedness and response (C/O/D) • Livelihood and land use (C) • Cultural heritage (C)	• Occupational Health and Safety (C/O/D) • Emergency preparedness and response (C/O/D) • Labour rights (C/O/D) • Employment (positive) (C/D) • Gender-Based Violence and Harassment (GBVH) (C/D) • Human rights (C/O/D) • Procurement/supply chain (C/O/D)
Scoped out: • Air quality (operations) • Noise • Soils (operations) • Landscape and visual impact (C/D) (including glint and glare) • Radio and TV interference (all phases) • Traffic and transportation (operations) • Greenhouse gases • Cultural heritage (operations) • Cumulative impacts (operation) • Indigenous Peoples • Transboundary impacts • Security (O) • EMF/EMC (O)		

4.2 Positive impacts and enhancements

The ESIA identified the following potential positive impacts:

- Temporary and permanent job creation (including prioritization 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 Labour, supply chain 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 a 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, EBRD PR2 Labour and working conditions and the ADB SPS*; at all times. IFC PS2, EBRD PR2 and the ADB SPS recognize that the pursuit of economic growth through employment creation and income generation should be accompanied by the protection of the fundamental rights of workers, including promoting diversity, fair pay, rest periods, non-discrimination, working time regulations and overtime restrictions. The Project will ensure, amongst other things, that all employees of the EPC and its subcontractors have an employment contract that is explained to the worker prior to signing, and that the employee be given a copy of this contract. Labour audits will ensure the of wage slips with information on wages, overtime hours and pay, deductions, and confirmation of their accuracy.

Masdar has a supply chain policy for its panels and batteries and requires all suppliers to comply with the Masdar Business Partner Code of Conduct (CoC). The CoC specifically addresses – among others – the supplier's compliance with international labour organization conventions and jurisdictional laws and restricts any engagement in any form of modern slavery or any use of child labour. Prior to signing any contracts, the supplier must pass the due diligence checks and verification run by an external entity

appointed by Masdar's Ethics & Compliance team. As a SPV, Source Trading follows the principles of competitive, transparent and fair tendering principles as stipulated in both the Corporate policy and procedures documents and the SPV procurement policy and procedures document. The process of contractual negotiations includes all required references, mitigation measures and contractual entitlements to ensure compliance with sanctions, ILO, Lenders specific requirements, export controls. In all cases, 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). 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' GM, 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, the proximity of the works to the existing gas pipeline, and the distance from the Yangiabad, Khalqabad, Batosh and Aynakul communities and nearby farming land, the Project may pose a risk to the local community. The Project site is also relatively remote, so access to medical facilities or support from local emergency services may be difficult. Natural hazards, including dust storms, earthquakes - zone of seismic intensity VII (very strong) - and climate-related risk events, e.g., extreme rain, may also occur unexpectedly. All Project infrastructure will be designed in accordance with national standards. In addition, the Project will develop an emergency preparedness and response plan (EPRP) in coordination with the relevant authorities (e.g. Uztransgaz) 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 services, 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 or pluvial flooding of the temporary streambeds) that, if not accounted for, can lead to run-off and soil erosion issues, and potential for prolonged periods of extreme heat during the summer months. These may lead to 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, pluvial flooding, and higher temperatures).

Emergency preparedness plans will include evacuation protocols (pluvial flooding), 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 and precipitation events through continuous weather monitoring and provide awareness training to workers on their rights regarding working in these conditions. Greenhouse gas calculations during construction and operation will be performed. Residual significance is determined as minor.

4.6 Construction nuisance (noise, air quality)

The Project will have a negligible impact on AQ, noise, groundwater, and water availability, cultural heritage and transportation infrastructure in the local region. Good practice measures for management and mitigation of these aspects have been outlined in the Project ESMP. Mitigation measures to ensure that dust and noise impacts on nearby sensitive receptors 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 grid connection 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 herder camps, and good vehicle management practices (e.g., no revving of engines, etc.). Combined, these measures ensure that impacts from noise are insignificant. The residual impact of air

quality and noise is reduced to minor (for workers) and neutral (for offsite receptors, including herders) and will be managed following an Emissions Management Plan.

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. 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, thus suitable disposal sites will have to be identified by the EPC contractor based on the project's Hazardous Materials and Waste Management Plan. All prohibited materials that may generate hazardous waste will be banned in project contracts. Washing of equipment and concrete washout shall be carried out in a designated impermeable area with dedicated drainage and settlement tank and where any hazardous liquids (e.g. oils or chemicals are stored, secondary containment with 110% the capacity of the stored material will be employed.

There is potential that hazardous materials used during the O&M phase as well as the materials in the equipment itself (e.g. batteries) may result in spills during the O&M phase which may lead to soil contamination. Any battery chemicals leakages will be collected be the drain siphon incorporated to the battery enclosure for appropriate disposal off site. Waste firefighting water will be collected by water pits for disposal off site.

A Hazardous Materials and Waste Management Plan will be required for each phase of the project to set out the procedures for handling, storing, transporting and disposing waste to an appropriate landfill in line with national laws and GIIP. All construction waste will be segregated on site for transfer to a recycling company in the region. Opportunities for re-use will also be explored. A contract will be signed with the relevant authorised waste management company directly and with any third -party organizations that dispose of specific waste (for example, hazardous or recycling operators). Weekly and monthly waste generation volumes for construction waste (segregated by waste stream as 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, UG cable and substation is considered minor.

4.8 Soils, hydrogeology and groundwater quality

There is a potential risk of causing contamination of soils and groundwater in particular during abnormal construction and operational scenarios e.g. hydraulic spills from construction vehicles or leakages from battery contained. A hazardous material and waste management plan and emergency preparedness and response management plan will be prepared to address this alongside design mitigation (such as bunding areas with high levels of hazardous materials).

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 Mobilisation 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 will also be employed to manage potential groundwater contamination risks (e.g., unplanned spills). The residual significance for impact on soils is deemed moderate and minor for contamination risk and risk to worker health. The site (in particular the ravines) is susceptible to flooding during rain events. The detailed site layout will be designed to avoid these ravines to ensure the exiting water regime can continue unaltered.

4.9 Water resource management (including groundwater) and water quality

The Project site is located approximately 12 km from the Guzardaryo River. No permanent surface water bodies on the Project site and no wells or boreholes were identified during the consultation. After heavy rainfall, temporary streams form during the wet season (spring or autumn). The PV site layout is planned to avoid as far as possible existing gullies to maintain waterflows through the site.

The new access road ROW passes close to a man-made water body (caused by leaks from the nearby water pipeline) that is used by herders for watering animals. A water sample was taken from a man-made water body (pond) northwest of the site area on 25-26

October 2023[5]. There are other nearby watering holes (within 1.5km) available to the herders and therefore herders will be encouraged to avoid this area during the construction period (approximately one year). As a precaution, measures to prevent contamination of this surface water body (and any water channels formed during rain events) from construction works during these periods and to minimize impacts from run-off will align with GIIP and include appropriate natural drainage designs, bunded storage for chemicals, fuels and oils, refuelling in dedicated areas, minimizing increased run-off from work areas, dedicated concrete washout areas, and the prohibition of any direct discharges of contaminated construction water to surface water, especially during rain events.

The water quality appears to be environmentally safe according to the values of the measured parameters: there are no exceedances of maximum permissible concentrations of harmful substances or deviations in pH. There are no discernible signs of pollution within the sample, and the observed values fall within acceptable limits for regulatory standards.

Table 5: Results of water analysis

Name of Parameters	Locations	The lower limit of detection	MPC Fishery water use
	W1		
pH	7.22	1-14	6.5-8.5
Turbidity mg/dm^3	0.06	0.001	40
Chlorides (Cl^-) mg/dm^3	18	0.5	300
Sulphates (SO_4^{2-}) mg/dm^3	8.70	2	100
Ammonium NH_4^- mg/dm^3	<0.05	0.05	0.5
Electrical conductivity µS/cm	949	10	-
Dissolved oxygen mgO_2/dm^3	8.9	-	-
Total suspended solids mg/dm^3	0.00	-	15
Chromium Cr^{3+} mg/dm^3	0.008	0.002	0.05
Chromium Cr^{6+} mg/dm^3	0.00	0.002	0.001
Cadmium (Cd) mg/dm^3	<0.0001	0.0001	0.005
Copper (Cu) mg/dm^3	0.003	0.002	0.001
Lead (Pb) mg/dm^3	0.00014	0.0002	0.03
Manganese (Mn), mg/ dm^3	0.016	0.0002	-
Mercury (Hg) mg/dm^3	0.00001	-	-
Nickel (Ni) mg/dm^3	0.0052	0.002	0.01

[5] The classification of the pond as mand made was confirmed by official communication from Uzsuvtaminot dated 12/11/2024) as the result of leakage from the Yakkabog-Guzor main water pipeline.

Zinc (Zn) mg/dm^3	0.0072	0.0002	0.01
Arsenic (As) mg/dm^3	0.0017	0.0001	0.05

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 are planned to be used for construction. Drinking water will be sourced from the Guzar municipal water supply and delivered via water tankers to the site. Dry cleaning will be undertaken during operation, and this, combined with low workforce numbers (up to 10 persons maximum), means that operational water use requirements are not considered to have a significant impact. Water resource management and use will be addressed in a Water Management Plan. 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 Lender requirements (EBRD PR5, IFC PS5 and ADB SR2). Land acquisition will be required for the Project, which will then be leased to the SPV company Nur-Kashkadarya Solar PV LLC FE.

There will be a permanent land take totalling 733.09 ha incorporating:

- 731 ha for the Project PV Site.
- 0.028 ha for the tower footprints.
- 0.362 ha for the cable route (including a 1m security setback on each side).
- 1.7 ha for the access road (based on approximately 1700 m long road with 10 m ROW).

Facilities such as construction and erection staging (unloading, site storage, workshop) areas, construction (workers) camps, spoil disposal sites, OHTL and underground cable construction and access tracks established for the new 220 kV powerline are expected to be completed within the Project existing land take (except for worker accommodation, which is expected to be located in the wider Project area), however there is a possibility that they take up additional land temporarily during the construction stage. The temporary land take requirements will be confirmed by the EPC Contractor during the construction phase and any land that is used temporarily will be returned to its original state once it is no longer required (at the end of the construction phase). The Project will

not result in any physical resettlement impacts. All economic resettlement impacts will be addressed in a Project Livelihood Restoration Plan (LRP) with compensation outlined following national laws and Lender requirements. All compensation will be identified and agreed upon with project affected people and will be delivered before construction commences.

4.11 Community health, safety and security

Several construction activities could impact the local community, including infrastructure and equipment design and safety, unplanned exposure to hazardous materials, 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 minor impacts. The Project management plans have placed several requirements 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 GM 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.
- Integrate worker influx management requirements (including GBVH risks) into relevant Project plans to be developed as part of the Project Health, Safety, Social and Environmental Management System (HSSE MS).
- Establish an Emergency Preparedness and Response Plan (EPRP).

The use of force by private security is only sanctioned as a last resort, 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. Security requirements will be managed in the Security and Human Rights Management Plan.

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. In addition, GBVH focal points will be established in HR management team on site and appropriate trainings to workers to sensitise the topic of GBVH and the GBVH grievance mechanism.

All residual impacts are considered to be minor. A Labour and Working Conditions Management Plan will define minimum standards required for all Workers on site and for managing worker influx and worker behaviour.

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 M39 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 M39 between the site and Guzar and Kamashi District, specifically when travelling through Yangiabad, Khalkabad, Batosh and Aynakul 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 M39 to the northwest 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 project area (total of 733ha) comprises three distinct habitats i) non-irrigated arable lands and fallow lands (596ha), loamy foothills with ephemeral-forb vegetation (112.5ha), Dry ravines and erosion gullies (24.6ha). All habitats within the Project site are under significant anthropogenic pressure, manifested by land cultivation and overgrazing which is reflected in the relatively low botanical species richness and relatively high proportional representation of weedy or adventitious species among the species documented in this habitat type in the survey plots on, and near the Project site. Based on the low botanical species richness recorded in the botanical sampling plots

located within and near the Project site, as well as the relatively high proportion of adventitious, weedy species among the species recorded, leads to a determination of Modified Habitat, per IFC PS6, for all habitats within the Project site.

The Project does not overlap, nor does it have the potential to generate significant adverse impacts on any national or international protected areas. The nearest protected area is the Pachkamar (or Chimkurgan) Reservoir IBA[6], located ca. 14 km to the north of the Project.

Ten distinct biodiversity features are classified as Priority Biodiversity Features (PBFs) per IFC PS6 and EBRD PR6. The Central Asian Tortoise, Marbled Polecat, and small terrestrial vertebrate species are particularly at risk of impacts from habitat disturbance and habitat loss. These, plus ground-foraging Macqueen's or Great Bustards, may experience either Habitat loss/degradation Impacts or disturbance/persecution impacts during the Project's construction and/or decommissioning phases. In addition, six bird-sensitive species (Sociable Lapwing, Steppe Eagle, Greater Spotted Eagle, Imperial Eagle, Egyptian Vulture, Saker Falcon) identified as PBF for the Project and expected to occur at the Project site only on a very limited basis either for overflights during migration (all six species) or during the breeding season (Egyptian Vulture) or brief migratory stopovers could also experience disturbance/persecution Impacts during Project construction. The Project Company will install bird flight diverters (BFDs) as a proactive mitigation measure for the project affiliated OHTL interconnection route, The measure is designed to reduce risks to bird species identified as PBFs in the CHA, as well as other bird species which may overfly the area.

The Project will entail the construction of only ca. 658 meters of new OHTL, and the area in which this new line will be constructed consists of 100% upland habitats that are heavily degraded; hence, the area is not expected to attract a concentration of electrocution-prone birds. Furthermore, this area already has numerous OHTLs present, further limiting the extent of this potential impact. Nevertheless, bird flight diverters and post construction bird fatality monitoring (monthly over two years) will be performed.

Prior to the start of works on site a survey for CAT will be performed focussing on the burrows identified during the ESIA process. Following a protocol for relocation and rescue as defined in the Project management plans, these will be removed from site prior to the works commencing. A permitter fence that does not allow the return of small mammals and reptiles will be used during the construction phase. For operation a permitted fence

[6] BirdLife International (2024) Important Bird Area factsheet: Chimkurgan Reservoir. Downloaded from https://datazone.birdlife.org/site/factsheet/chimkurgan-reservoir-iba-uzbekistan on 25/07/2024.

with a small gap will be erected to allow the free movement of small mammal and reptile species on and off the Project site.

Using the area for construction will change the environment and expose the ecosystems to change, but in this case, the degradation of the ecosystems will be minimal due to the existing degradation. A Biodiversity Management Plan will be developed to deal with survey and monitoring for important species as well as dealing with unexpected chance finds for species of conservation importance during construction works. Measures will also be put in place to manage the further spread of invasive species, and to ensure temporarily disturbed land will be returned to a natural state. General mitigation measures for the protection of species e.g. use of low intensity lighting, traffic management and escape routes from excavations and trenches will also be applied. Residual impacts are considered to be minor (for PBF species) or neutral significance.

4.14 Cultural heritage

No items of tangible cultural heritage as listed in the UNESCO World Heritage List are located within the Project site. The Institute of Archaeology, on behalf of the Ministry of Culture, has conducted above and below-ground investigations in May/June 2024 following the requirements of Law of the Republic of Uzbekistan No. 229 "On Protection and Use of Archaeological Heritage Sites. The findings of the final fieldwork determined that no archaeological objects or monuments with a cultural layer were identified within 8-10 km from a Project boundary or inside a Project boundary.

During below-ground excavation, the Institute of Archaeology will oversee the works and support the Project to implement the Project archaeological Chance Find Procedure for any unexpected finds during excavation and groundwork. Furthermore, areas where archaeological finds were found during the ESIA process that are not in the direct area of impact will be protected from encroachment during the construction process including specifically that a requirement to train/inform all workers on the sensitivity of the area to potential unknown archaeology and the need to work under the supervision of an Archaeological watching brief and chance finds procedure. Residual impacts are considered to be low 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 (batteries and PV panels). The Masdar procurement policy includes

for the return of PV panels and batteries to the suppliers for recycling in addition, the contractor will explore potential options for recycling of all other wastes during the decommissioning phase.

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 must be signed and complied with, and any conflict will be managed through the Project's disciplinary procedures. No indigenous peoples, as defined by EBRD PR7, IFC PS7 or ADB SR3, have been identified in the Project area of influence.

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 for compliance with applicable IFC Performance Standards, EBRD Performance Requirements and ADB safeguards requirements.

The EPC Contractor will adopt the Masdar corporate health, safety, social and environment management system (HSSE MS), and the Project Company will oversee the project's development, construction, and operational activities. The HSSE MS comprises Masdar policies, project assessment documentation, construction environmental and social management system, topic-specific management plans, and reporting templates for monitoring progress. The HSSE MS will be supported by a contractor management system and plans outlining procedures for implementing the requirements of the ESIA and the HSSE MS. The HSSE MS 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). The HSSE MS includes the following supporting plans and procedures.

- Site Mobilisation Plan
- ESMS Manual
- Subcontractor and Supplier Management Plan (MP) and external grievance mechanism

- Stakeholder Engagement Plan
- External Grievance Mechanism
- Land Acquisition and Livelihood Restoration Plan
- Community Development Plan Labor and Working Conditions MP
- Worker Accommodation MP
- Occupational H&S MP
- Training MP
- Emergency Preparedness and Response MP
- Traffic and Transportation MP
- Security and Human Rights MP
- Hazardous Material and Waste MP
- Water MP
- Biodiversity MP
- Emissions MP
- Chance Finds Procedure
- Local Hiring and Gender MP

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
- Identification and management of cultural heritage chance finds
- Emergency preparedness and response.

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. 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 will implement the following measures to protect the community and workforce:

- Require all traffic to be managed along M39.
- 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 Yangiabad, Khalkabad, Batosh and Aynakul communities, herders and women.
- Require all workers and security personnel to sign a "code of conduct" (including GBVH code of conduct)
- Require all contractors and their subcontractors to adhere to the Project labour requirements, which aligns with national regulation and IFC PS 2 on labour.
- Require all contractors and their subcontractors to adhere to the Labour and Working Conditions management plan, which sets out requirements for contractors, including disciplinary actions.
- GBVH focal points in HR management team on site, appropriate trainings to workers (for occupational and Community H&S) and specific GBVH grievance redress mechanism.

- Disclose a "community GM" and stakeholder engagement program before work commences that sets out how the community can seek remedy for any concerns or grievances concerning the Project, including GBVH grievances
- House workers from outside the project area or municipality in accommodation away from the immediate community (Yangiabad, Khalkabad, Batosh and Aynakul communities) in preference to reduced potential social tensions[7].
- Daily visual monitoring for dust and noise.
- Bird flight diverters on overhead line as a precaution for birds and postr construction fatality monitoring.
- Fencing to allow reptiles to pass through the site during operation (fenced off during construction).
- CAT rescue and relocation procedure with a CAT unbepxzted finds protocol.

The EPC Contractor will be required to implement an EPC-HSSE MS to oversee the Project's construction activities. The EPC-HSSE MS 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 HSSE MS 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 impacts from solar PV and BESS 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.

[7] Contractor accommodation may be in Guzar and further afield, local community of Yangiabad, Khalkabad, Batosh and Aynakul and purpose built offsite temporary accommodation (location to be determined).

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 (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

Term	Definitions
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 finds	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 dialogue process 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
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

Term	Definitions
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
Health, Safety, Social and Environmental Management System (HSSEMS)	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
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 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

Term	Definitions
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
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