

Non-Technical Summary (NTS)

For Photovoltaic Power Plant Sainshand,
Mongolia

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By Desert Solar Power One LLC



Table of Contents

| | |
|---|-----------|
| CHAPTER 1 INTRODUCTION..... | 2 |
| 1.1 Project Introduction..... | 2 |
| 1.2 Project Location..... | 2 |
| 1.3 Project Components..... | 4 |
| 1.4 Transport and Accessibility | 5 |
| 1.5 Project Phases..... | 6 |
| | |
| CHAPTER 2 PROJECT BACKGROUND | 7 |
| 2.1 Project Rationale..... | 7 |
| 2.2 Project Alternatives..... | 7 |
| 2.3 Project Development Process and current Status..... | 8 |
| 2.4 ESIA and Strategic Assessment Process..... | 9 |
| 2.5 Public Consultations and Disclosure | 10 |
| 2.6 Current Environmental and Social Situation and Consideration | 11 |
| | |
| CHAPTER 3 SUMMARY OF ENVIRONMENTAL AND SOCIAL IMPACTS AND BENEFITS | 12 |
| 3.1 Introduction..... | 12 |
| 3.2 Summary of Environmental and Social Benefits, Potential Adverse Impacts, Mitigation and Management Measures..... | 13 |
| | |
| CHAPTER 4 FURTHER INFORMATION AND CONTACT DETAILS | 18 |
| 4.1 Contact Details and further information..... | 18 |
| 4.2 How to address any issue | 18 |

CHAPTER 1 INTRODUCTION

Based on the findings of the Environmental and Social Impact Assessment (ESIA) study conducted on the 30 MWp Solar Power Plant being developed in Sainshand, Mongolia (hereinafter referred as the Project), this non-technical summary (NTS) provides a summary in non-technical language, especially regarding the project scope, the benefits of the project and mitigation actions on the impacts of the project.

The ESIA contains more detailed information on the Project and the environmental and social issues considered. It describes the need for the project, the details of the project and considers alternatives for the project. Potential effects of the Project on the environment and the local community are assessed and mitigation actions are proposed. The developer commits to the Environmental and Social Management Plan (ESMP), which describes the monitoring and mitigation requirements for the duration of the project, including the construction, the operation and the decommissioning phase.

Further, a Stakeholder Engagement Plan (SEP) has been developed alongside the ESIA, which describes the planned stakeholder consultation activities and engagement process.

1.1 Project Introduction

The Project consists of a PV Solar Power Plant in south-eastern Mongolia to generate up to 30 MWp of electricity for the national grid. In 2014, the project land of 714,000 sqm has been leased from the city council of Sainshand for the next 25 years. The on-site substation will transport the electricity generated from the plant via an overhead transmission line to the main grid substation, which located 2.7 km from the project site. A network of roads and other infrastructure will be constructed on-site in order to allow the construction and maintenance of the plant.

1.2 Project Location

The Project is being developed in south-eastern Mongolia situated next to the Sainshand city in Dornogobi Province, approximately 450 km south east from Ulaanbaatar. Around 80ha of unused land which is owned by the city of Sainshand is explored for its aptitude for PV power generation. The land is government owned and has been leased by the project company from the government. The city of Sainshand is situated about 4 km north from the project site. The location for the proposed PV Power Plant is sketched in Figure 1-1. A general overview of the proposed PV area is presented in Figure 1-2 and

Figure 1-3 and Figure 1-4 present photos from the project site to illustrate the current landscape and surroundings of the project site.



Figure 1-1 Map of Mongolia with Project location



Figure 1-2 Overview of proposed PV Area



Figure 1-3 On site view in south-west direction



Figure 1-4 On site view in west direction

1.3 Project Components

The PV project contains three major components, which are PV modules, mounting system and invertors. The Project will also include underground cables which connect the solar panels with the invertors and the on- site substation. Further, there will be a control centre compound including permanent worker's facilities and site offices located on the project site. An approximately 3km 35kV overhead transmission line will connect the on-site substation with the existing grid substation in Sainshand. In order to allow the construction and maintenance of the plant, access roads from the existing highway to the Project site and necessary connection roads on the project site will be build.

The Project will consist of approximately 110,880 solar modules, each consisting of 60 cells of polycrystalline technology. Each cell has a size of 15.6 cm x 15.6 cm. One module comes with a nominal maximal power of 270W. A typical solar power panel is shown in Figure 1-5 below.

The route of the transmission line is within a range of maximum +/- 200m of the route indicated in Figure 1-2. The transmission line will be approximately 3km long.

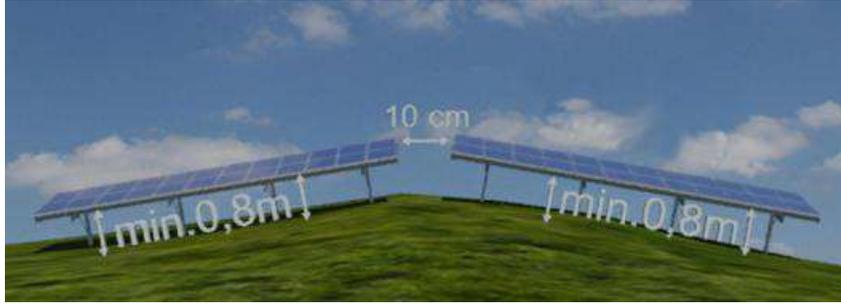


Figure 1-5: Typical sketch for changing table inclinations

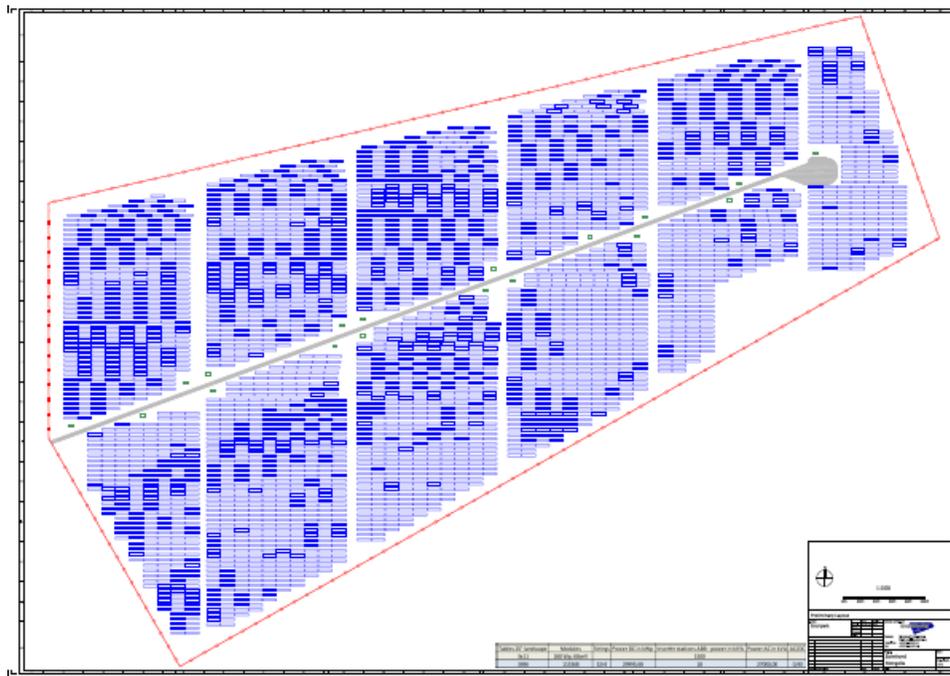


Figure 1-6: Conceptual Area Layout

1.4 Transport and Accessibility

Mongolia has an emerging infrastructure. For the accessibility of Mongolia from abroad, which is required to transport equipment like inverters, modules and mounting structure, the railroad can be used. The site location is very close to the railway station of Sainshand.

After reaching the railway station, the equipment shall be loaded onto trucks, respectively heavy-duty trucks. The route of the trucks from the rail station to the site is shown in

Figure 1-6. The distance between both locations is approximately 8.5 km only. All related existing roads are in adequate conditions.

Construction works will increase the number of large vehicles on local roads and might damage the roads. Overall, the impact on existing transportation infrastructure will be minor due to the short duration and the short distance to the project site.

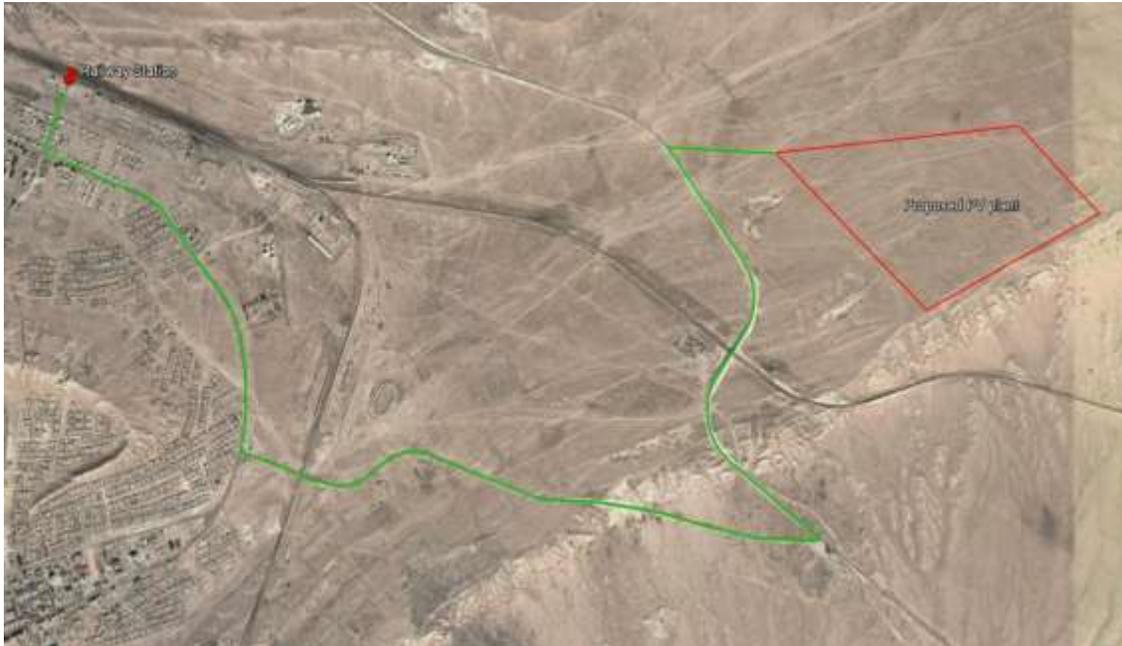


Figure 1-6: Route from rail station to PV site

1.5 Project Phases

Planning and Construction Phase (June 2018-May 2019): This included the preparation of a detailed design, planning and transportation of the various components to the site, and onsite preparation activities for the installation of the PV modules, central inverters and other components.

Operation Phase (2019-approximately 2039): This phase will involve the normal daily operation and maintenance of the facility ensuring it runs as efficiently for the supporting population.

Decommissioning Phase (open): It is unclear if the operation of the facility is extended after 20 years or if the facility is completely decommissioned in 2039. The decommissioning of the facility would include the disconnection of all components for their final disposal.

CHAPTER 2 PROJECT BACKGROUND

2.1 *Project Rationale*

The project will result in crucial positive environmental and economic impacts on the strategic and national level. Mongolia has adopted a national program aimed at reducing greenhouse gas emission and promoting the use of renewable power. The government set the aim to have 20-25% of the Mongolian energy produced by renewable energy sources by 2020. Today the main part of energy in Mongolia is produced by coal-fired plants. These plants cause significant short-term and long-term environmental damages

The Government of Mongolia promotes electric power generation from renewable energies to further increase its domestic total power generation capacity. Economic growth and a boom in the mining sector are leading to a higher energy demand for the whole country. Especially during peak demand expensive electricity has to be imported from Russia.

Mongolia has tremendous renewable energy resources available, in particular the energy of the sun. Mongolia has very convenient climatic conditions for effective use of these resources. Due to PV plants Mongolia is able to reduce the energy import expenses from Russia significantly, making solar power an important part of achieving national renewable energy targets.

2.2 *Project Alternatives*

The analysis for this project contains options that include site selection alternatives, the “With Project” versus “Without Project” alternative and other energy resources alternatives.

The landscape on the proposed site shows a very scarce and low vegetation (no trees). Besides, the location has the advantage of having great accessibility to other countries, especially China, as there is a railroad nearby connecting Mongolia with China, offering an ideal opportunity to transport all relevant components of a PV power plant. Solar devices were put to collect data on solar conditions and the distance to substation was also weighed as a key element. The other sites that were considered include Dalanzadgad, Arvaikheer, Choir, Mandalgovi, Herlingiin Den, Taishir, Dorgon and Durgun.. Having put everything into consideration, Sainshand was chosen as the site where the 30MWp solar project is going to be implemented.

Going forward with the proposed project alternative is considered the best possible option as opposed to „No Project“ since the proposed project is considered a green and

environmental solution for energy generation in Mongolia as the solar energy considered as renewable clean technology with no emissions as well as the global and local trend for energy generation.

Using solar energy is one of the preferable options with less impact than the conventional resources, furthermore, it is considered as a promising green option for Mongolia with high sunshine days and high land availability.

2.3 Project Development Process and Current Status

In 2012, a MoU was signed between the developer and the Ministry of Energy of Mongolia to develop in total 100 MW in several projects, whereas the first 30 MWp Project is now being constructed in Sainshand.

The approval process for Energy Projects is fixed within the Energy Law. The Energy Law provides the legal framework for the energy sector restructuring from being centrally planned to market-based. This law introduced the independent energy regulator, the Energy Regulatory Authority, and vested powers and responsibilities to key institutions involved in managing and operating the energy sector. With the 2001 establishment of the Energy Regulatory Authority (Energy Regulatory Committee (ERC) since 2012), energy regulation has been in place for over a decade.

During the past years, the developer has secured all major licenses and approvals required for the construction of the project. They include:

- The land use rights for the land on which the Solar PV Power Plant shall be build;
- Construction License for constructing the Solar PV Power Plant
- General Environmental Impact Assessment (EIA)
- Environmental protection action plan
- Grid Capacity Study
- Signed Power Purchase Agreement
- Electric Power Dispatching Services Agreement
- Feasibility Study Approval

The land for the Project has been secured through a long-term lease agreement. The EIA has been approved by the Ministry of Environment and Urban Development in 2013 and

the construction is expected to be completed in 2017. Obtaining the remaining permits is currently ongoing.

2.4 *ESIA and Strategic Assessment Process*

In addition to the Environmental Impact Assessment (EIA) required and approved by the Ministry of Environment and Urban Development in 2013, an environmental and social impact assessment (ESIA) study has been conducted in line with the European Bank for Reconstruction and Development (EBRD) Environmental and Social policy. The ESIA addresses issues of environmental protection, social and environmental risk management, information disclosure and stakeholder engagement.

| EBRD Performance Requirements | Description | Applicable |
|---|---|-------------------|
| PR1: Assessment and Management of Environmental and Social Impacts and Issues | Requires assessment of negative and positive environmental and social impacts at an early stage of project development and the adoption of a systematic approach to monitor and manage impacts on an on-going basis. | Yes |
| PR2: Labour and Working Conditions | Requires that the pursuit of economic growth through employment creation and income generation must be accompanied by protection of the fundamental rights of workers. It is designed to maintain sound worker-management relationships and promote fair treatment, non-discrimination and equal opportunities for workers. | Yes |
| PR3: Resource Efficiency, Pollution Prevention and Control | Requires a project-level approach to pollution prevention and control as well as resource efficiency in line with European and international legislation and practices. | Yes |
| PR4: Health and Safety | Addresses the responsibility to avoid or minimise the risks and impacts to community health, safety and security of the local community that may arise from project-related activities, with particular attention to vulnerable groups. | Yes |

| | | |
|---|--|---|
| PR5: Land Acquisition, Involuntary Resettlement and Economic Displacement | Is triggered when land acquisition is undertaken involuntarily when the Project has right to legally expropriate land. Resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets on land or access to assets on land that leads to loss of income sources or other means of livelihoods). | Yes |
| PR6: Biodiversity Conservation and Sustainable Management of Living Natural Resources | Requires that projects avoid or mitigate threats to biodiversity arising from their operations, as well as manage renewable natural resources in a sustainable manner. Where critical or natural habitats are affected, projects must achieve „net gain“ or „no net loss“ in biodiversity respectively. | Yes |
| PR07: Indigenous Peoples | Requirement to safeguard the rights of indigenous peoples, identified as social groups with identities that are distinct from mainstream groups in national societies, and who are often among the most marginalized and vulnerable segments of the population. | No, no occurrences in the location of the Project |
| PR08: Cultural Heritage | Aims to ensure that developers protect cultural heritage in the course of project activities and to support the conservation of cultural heritage. | No, no cultural heritage in the location of the Project |

2.5 Public Consultations and Disclosure

According to the Mongolian legislation, it was not required to consult the public in the scope of the EIA. Nevertheless, a Stakeholder Engagement Plan (SEP) has been developed in the frame of the ESIA and in line with the EBRD PR 10 requirement, which sets out certain recommendations for stakeholder engagement to ensure that stakeholders are appropriately engaged on environmental and social issues that could potentially affect them through a process of information disclosure and meaningful consultation.

A draft of the ESIA has been disclosed to the public and key project stakeholders have been identified to organize the planned stakeholder engagement that will be implemented throughout the Project (For details, please refer to the SEP).

Key Stakeholders include:

- Workers and employees on site and workforce of EPC Contractor and Project Operator
- Local Residents
- Herders and Normads
- Government Organisations
- Non-Government Organisations
- Suppliers and Construction Companies
- Investors

2.6 Current Environmental and Social Situation and Consideration

a) Environmental

The Project area does not lie within any internationally or nationally designated areas for nature conservation or area of high biodiversity value. A biodiversity study has been conducted.

Most of the plant species in the region belong to the dry-rocky ecological communities and a few others belong to the dry-salt marsh ecological communities, which can be seen as a distinguishing feature of the area. In general, the land on which the power plant is to be built has more or less degraded and has been widely covered by anthropophilic plants.

As of fauna that represents the region in which Sainshand town is located, only few species of vertebrates observed in addition to few ground and soil-inhabiting insects that is typical to extreme arid environment. The project area has avian representatives of Passeriformes of the steppe-desert and the chance of migratory birds passing over is low.

The total project site comprises approximately 741.000 sqm. The Project area is located at approximately 940 m above sea level, at a distance of 4 km north-west of Sainshand city. The area is a relatively flat, open desert consisting of grassland with brown, light brown coloured soil. The land is not used for agricultural farming or similar activities and its usage for the project does not endanger any flora and fauna species.

The climate of the region is an intercontinental climate with a broad temperature range between winter and summer. The average temperature ranges from -18.1°C in winter to an average of 22.7°C in summer. Most of its rains falls during the summer. It is generally a region of high atmospheric pressure. It is constantly windy throughout the

year, whereas the strongest winds are measured during spring with wind speeds of up to 6.0 m/second.

No shortage of underground water resources is expected within the project implementation area or surroundings due to the construction of the Project and its later operation.

There are no known archaeological or cultural heritage features within the project site.

b) Social

The population of Dornogobi province was 60.9 thousand permanent residents as of the end of 2012 and low growing rates have been observed in the past years. Sainshand is a very well-developed city with stable infrastructure and centralized development.

The cost of living for the population in the province is higher than the national average at present. 19.6 percent of the population is living below the poverty line.

In the city, there are 500 enterprises, organizations, industry and service providers registered. Currently, the unemployment rate is 2.6%. Most of them are aged between 25 and 35 years and are active in the sectors education, arts and culture.

Dornogovi province is considered as a region with highly developed road, communication and infrastructure.

CHAPTER 3 SUMMARY OF ENVIRONMENTAL AND SOCIAL IMPACTS AND BENEFITS

3.1 Introduction

The ESIA identifies the main environmental and social impacts associated with the construction as well as operation of the Project. Further, mitigation measures were identified for potential significant effects and the significance of residual effects determined. These mitigation measures will be implemented by the determined party to reduce or remove the negative impacts of the Project. The following chapter summarizes the key findings.

3.2 *Summary of Environmental and Social Benefits, Potential Adverse Impacts, Mitigation and Management Measures*

1) Air quality

Construction activities may produce an increased level of dust and emissions which may temporarily impact the air quality. Here, the machinery and equipment are considered the main factor and mitigation measures have been identified to reduce the impact on air quality. This includes the usage of adequate equipment, the covering of transportation vehicles and the spreading of paved roads with water. After the completion of the construction works, areas without concrete pavement shall be covered with gravel in order to prevent emerging of dust. Further, workers shall at all times be equipped with proper protective equipment when conducting activities that contain a high level of dust.

2) Water Usage

The improper management of water and wastewater could have an impact on the availability of water in the province. In order to save natural resources and to mitigate the impact on the current environment, live style and farming and in order to comply with the existing regulations in Mongolia, several mitigation measures shall be implemented during the construction as well as operation of the Project. They include mechanisms on water conservation in order to reduce the total water usage, authorized hazardous waste disposals and suitable storage containers, which are emptied regularly and considering of possible floods and runoffs from rainfall in the design of the Project. The groundwater shall be inspected and tested in appropriate periods.

The groundwater in the Gobi region is not suitable for drinking and drinking water is planned to be supplied and provided by the water reservoir of Sainshand city. There are low amounts of drinking water needed and the supply of the community with drinking water is not endangered. The impacts of the construction and operation of the plant on ground water are considered low.

3) Biodiversity and nature conservation

A biodiversity study has been conducted in order to identify existing flora and fauna that might be harmed by the Project construction and operation.

In general, the land on which the power plant is to be built has more or less degraded and has been widely covered by anthropophilic plants. As of fauna, only few species of

vertebrates observed in addition to few ground and soil-inhabiting insects that is typical to extreme arid environment.

At the present time the project area is used as the pasture land by nomads and there are no activities which could affect the particular area negatively. Due to construction and installation works of the Solar PV power plant and the transmission line, the vegetation cover can be destroyed. There is no negative impact expected on the flora during the operation of the Project.

In order to mitigate the impact on the existing flora in the area during the construction phase, the local workforce needs to be aware of mitigation measures and needs to make sure, the impact is kept on the lowest possible level. Further, the current flora shall be taken into account when planning roads and flammable materials shall be kept in a suitable way.

Further, there might be negative on the existing fauna on the project site. This may include that certain fauna flees from their habitat, a possible impact through waste water and any distraction of the fauna due to vibrations caused through heavy machinery during construction. The overall impact on the fauna is considered as low due to the site's low ecological significance.

Mitigation measures have been developed in order to minimize the potential impacts on existing fauna. These include the usage of appropriate construction materials and the appropriate handling of flammable and lubricating materials. Awareness of the local workforce concerning the existing fauna shall be established and hunting shall be prohibited. Further, there shall be small holes left in the fences in order to allow small animals to escape the project site and keep up their natural movements.

4) Landscape and Visual

Landscape and visual impacts of the Project have been assessed. These impacts during the operation of the project have been classified as low. The main visual impact are the photovoltaic panels and possible reflections during the day. This is not considered as a risk as the project site is situated far from any airports or residential areas. Any visual impacts during the construction phase are short term impacts and without any significance. It has been agreed that proper housekeeping is ensured during construction and any colourful graphics and advertisement will be avoided on the site.

5) *Soil*

Soil erosion may be caused due to human activity within the framework of construction works and the utilization of heavy machinery and other technical equipment.

To mitigate this risk, where necessary trees, shrubs and perennials shall be planted and cultivated to prevent soil erosion. Where possible, the original soil layer shall be maintained, and all vehicles shall use designated, paved roads.

6) *Waste Management*

The improper management of waste streams, including solid waste as well as hazardous waste, may result in the pollution of the soil as well as the ground water. Main risks during construction are considered fuel and lubricant leakages.

Appropriate mitigation measures have been identified to be taken into account during the construction as well as during the operation phase in order to minimize soil pollution and impact on the ground water. A proper waste management plan shall be implemented and containers with respective labelling shall be used for disposal. These containers shall be emptied regularly, and the overall amount of waste should be kept at a minimum level. The spillage of hazardous waste shall be prevented at all times and machinery and other equipment shall be under regular maintenance.

7) *Cultural Heritage*

There was no historical and cultural heritage or memorabilia discovered within the project area as well as along the transmission line corridor. In case of such discovery during the implementation of construction works of the Project, necessary preservation and protection measures shall be taken in cooperation with provincial and local authorities, including professional organizations.

8) *Noise*

The operation of the Project is not considered to exhibit any significant noises. Although temporarily, construction and decommissioning activities will contribute to noise impacts. Especially the use of machinery and equipment are expected to be a source of noise and vibration within the project site and its surroundings. The closest community to the project area is about 4km away. Therefore, potentially impacted are the workers on site, the fauna and other people passing the site.

An operational transmission line can be a source of a phenomenon known as "corona discharge". Any corona discharge would act as a source of audible noise i.e. a crackling sound occasionally accompanied by a low frequency hum in certain wet conditions. The high variability in the response of individuals to identical noise sources makes the prediction of annoyance very difficult. Each individual's response to increased noise levels is subjective and highly personal. The overall noise impact during operation of the transmission line is considered as not severe.

Mitigation measures have been identified for noise control. These include the usage of appropriate technical equipment with adequate noise levels and regular inspections. Further, the workplace for employees shall be in accordance with the requirements of protective clothing and accessories shall ensure protection during activities with high noise levels.

9) Infrastructure and Utilities

The main impact of the Project on the existing infrastructure and utilities is expected to be in the traffic and road networks. Increased amounts of traffic during construction as well as decommissioning can have an impact in the road network and local traffic.

The main part of the transportation of equipment and machinery will be done over train networks. The impact hereto is considered low. For the last 8km, components have to be transported on trucks from the Sainshand train station to the project site.

The existing roads are sufficient enough to handle the required vehicles. Nevertheless, there might be damages on existing roads which are difficult to be measured beforehand. Further, the impact will be temporarily during construction and decommissioning only. The construction phase is expected to last approximately 3-5 months. There are no increased levels of traffic expected during the operation phase.

10) Community Health and Security

Increased levels of traffic can cause congestion on the road networks around and within the site and thereby leading to potential accidents. This impact is considered short-term and is not anticipated to cause any permanent effect on the receiving environment.

Nevertheless, transport shall be managed in order to keep the increase in traffic to a minimum level. Where possible it shall be avoided to access residential areas and main parts of the city with slow moving heavy transportation vehicles and all trucks shall be operated by licensed operators and comply with the proposed speed limits.

An onsite safety guard should be present at all times in order to avoid unauthorized access to the project site. These guards must be adequately trained. Further, set up signs in an adequate distance to the project area warning about the public safety risk of present components (substation, modules).

11) Occupational Health and Security

There could be additional risks arising for workers health and safety during construction and operation due to improper material, maintenance of machines and training. The risk of injury and death due to accidents may be increased.

Therefore, a Workers Health and Safety Plan shall be developed in order to ensure the safety of any employee on the construction site as well as during operation of the Project. Such plan shall, among others, include the proper maintenance of any machines and tools used, the proper instruction and training of personnel to use such machines and the supply of adequate working equipment for the workers.

Further, the project site shall be fenced in order to avoid unauthorized access. Especially the substation area must be fenced with concrete walls and locked for unauthorised personnel at all times.

12) Socio-Economic Conditions

The Developer is committed to social responsibility and local community engagement and development. Job vacancies during the construction as well as the operation phase, for skilled as well as unskilled jobs, shall be to the highest extent possible be granted to local people within Sainshand city and other parts of Mongolia. This includes especially vacancies for administrative and security positions as well as unskilled construction workers. The exact numbers of local people hired is not determined yet but will be published in the course of construction planning.

Further, a corporate social responsibility (CSR) program shall be implemented. Through all project stages it is necessary to assess and address the needs of the local community and work together with community members. The plan shall address the aims and objectives of community members and shall give them the opportunity to participate by expressing their concerns and limitations. It is considered important to build up a strong socio-economic relationship with the local community throughout the project.

Cooperation with local universities shall be implemented in order to allow local and international students to gain hand on experience from the project.

CHAPTER 4 FURTHER INFORMATION AND CONTACT DETAILS

4.1 Contact Details and further information

The full Project preparation documents, including the ESIA (including its annexes like the ESMP) and the NTS and SEP are available on the EBRD website as well as the developer's website. Further, hard copies can be found at the following entities:

- BTT Center, Room 403, Khan-Uul District, Chinggis Avenue-34, BTT-Center, Ulaanbaatar-210351, Mongolia
- Sainshand Solar PV-Park, Sainshand, Dornгови, Mongolia

The contact details of the developer are as follows. All requests for further information may be addressed to the contact presented below.

Company contact name: Desert Solar Power One LLC

Address: BTT Center, Room 403, Khan-Uul District, Chinggis Avenue-34, BTT-Center, Ulaanbaatar-210351, Mongolia

Telephone number: 70112029

E-Mail: batu_co@yahoo.com

The contact details at the Project Site are as follows. All requests for further information may be addressed to the contact presented below.

Company Contact Name: Mr. Chingis Dashiyn, Desert Solar Power One LLC

Position: Site Manager / Community Liaison Officer

Telephone: +976 8818 7720

Email: cd@unitedgreen.com

4.2 How to address any issues

All concern and requests may be addressed and submitted by post, via E-Mail, at the local office, Project site directly or by telephoning the company under the numbers stated above.