Environment and Social Due Diligence Report

November 2016

IND: Clean Energy Finance Investment Program –Azure Clean Energy Private Limited

Prepared by

Indian Renewable Energy Development Agency for the Asian Development Bank

DUE DILIGENCE REPORT
ON
ENVIRONMENTAL SAFEGUARDS

(LOAN 3186-IND: CLEAN ENERGY FINANCE INVESTMENT PROGRAM-TRANCHE I)

Subproject: 40MW Solar PV Power Project near Hardhani and Nandiya Kalan Village, Jodhpur District, Rajasthan

Subproject Developer: Azure Clean Energy Private limited

(Subsidiary of Azure Power India Private Limited-APIPL)

APRIL 2015

ESSU, IREDA
3rd Floor, August Kranthi Bhavan,
Bhikaji Cama Place
New Delhi 110 066

DUE DILIGENCE REPORT
ON
ENVIRONMENTAL & SOCIAL SAFEGUARDS

(LOAN 3186-IND: CLEAN ENERGY INVESTMENT PROGRAM-TRANCHE I)

Subproject: 40MW Solar PV Power Project near Hardhani Village, Jodhpur District, Rajasthan

Subproject Developer: Azure Green Tech Private limited

(Subsidiary of Azure Power India Private Limited)

Prepared by	**HARI PRAKASH**, ADB TA, Environmental Safeguard Specialist	
	M. K. MOHANTY, ADB TA, Social Safeguard Specialist	
Review by	**RUCHIKA DRALL**, Environmental & Social Officer, ESSU, IREDA	
Approved by	**KHEKIHO YEPTHO**, Head ESSU & Compliance Officer, IREDA	

CONTENT

ANNEXURES

List of Abbreviations

APIPL	:	Azure Power India Private Limited
BOO	:	Build Own and Operate
CCEA	:	Cabinet Committee on Economic Affairs
CTE	:	consent to establish
CTO	:	consent to operate
DPR	:	Detailed Project Report
ESDD	:	environmental safeguard due diligence
ESSU	:	Environmental and Social Safeguard Unit
GoI	:	Government of India
IFC	:	International Finance Corporation
IREDA	:	Indian Renewable Energy Development Agency Limited
JNNSM	:	Jawaharlal Nehru National Solar Mission
LoC	:	Line of Credit
MNRE	:	Ministry of New and Renewable Energy
MoEF & CC	:	Ministry of Environment, Forests and Climate Change
NCEF	:	National Clean Energy Fund
NVVN	:	NTPC Vidyut Vyapar Nigam Limited
PPA	:	power purchase agreement
RRECL	:	Rajasthan Renewable Energy Corporation Limited
RSPCB	:	Rajasthan State Pollution Control Board
RVPNL	:	Rajasthan Rajya Vidyut Prasaran Nigam Limited
SPS	:	Safeguard Policy Statement
SECI	:	Solar Energy Corporation of India
SEIA	:	(social and environmental impact assessment
SHES	:	Safety, Health, Environment and Social
SPV	:	special purpose vehicle
VGF	:	viability gap funding)

PART I

ENVIRONMENTAL SAFEGUARDS DUE DILIGENCE REPORT

Environmental Safeguards Due Diligence Report

Sub Project: 40 MW Solar PV Power Project near Hardhani and Nandiya Kalan Village, Jodhpur District, Rajasthan

A. Sub Project Title

1. The subproject is construction and commissioning of 40 MW capacity solar power project using Thin Film Cadmium Telluride (Cd Te) technology near Hardhani and Nandiya Kalan Villages in Baori Tehsil, Jodhpur district in the state of Rajasthan, India. The Azure Power India Private Limited (APIPL) is the promoter cum developer of the subproject and has signed a power purchase agreement (PPA) with Solar Energy Corporation of India (SECI), under MNRE, GoI IREDA is processing a loan to APIPL and intends to fund the subproject through LoC (Line of credit) from ADB.

B. Sub Project Background

2. GoI (Government of India) has launched Jawaharlal Nehru National Solar Mission(JNSM) on the January 11, 2010 with a target to deploy 20,000 MW of grid connected solar power by 2022 and to reduce cost of solar power generation in the country through (i) long term policy; (ii) large scale deployment goals; (iii) aggressive R&D; and (iv) domestic production of critical raw materials, components and products. JNSM envisages to establish India as a global leader in solar energy and achieve grid tariff parity by 2022.

3. JNSM, in order to achieve its objective has adopted a 3-phase approach with set targets for capacity additions as given in **Table 1.**

Table 1: JNNSM Capacity Addition Targets for 2010-2022

S.No.	Segment	Targets for Phase I (2010-2013)	Cumulative Targets for Phase II (2013-2017)	Cumulative Targets for Phase III (2017-2022)
1	Utility Grid Power including rooftop	1,000-2,000 MW	4,000-10,000 MW	20,000 MW
2	Off-grid Solar applications	200 MW	1000 MW	2000 MW
3	Solar collectors	7 million sq. metres	15 million sq. metres	20 million sq. metres
Source: Solar Energy Corporation of India/MNRE, GoI				

4. At present, 1685 MW of Solar Power Projects has been completed under JNSM-Phase I. Under Phase II(Batch I), the Cabinet Committee on Economic Affairs(CCEA), GoI has approved setting up of 750 MW of solar PV power projects, mainly through involvement of private sector on BOO basis (Build Own and Operate) with VGF (viability gap funding) support from NCEF (National Clean Energy Fund) provided through SECI.

5. The selection of project developers for solar projects under Phase II (Batch I), JNSM has been done by SECI through a competitive bidding process for VGF funding in order to enable project developers to supply power to SECI at the fixed tariff of Rs 5.45 per kWh for 25 years.

6. Further, under Phase II (Batch II), 1500 MW capacity of solar power projects are scheduled to be implemented through NTPC Vidyut Vyapar Nigam Limited (NVVN) on the same lines of Phase II (Batch I) being implemented by SECI. The Phase III JNSM scheduled for years between 2017 - 2022 is under planning and is yet to take off.

7. The present project 40 MW capacity solar PV power project near Hardhani and Nandiya Kalan villages in Baori Tehsil, Jodhpur District is a part of the 750 MW of solar power projects under Phase II (Batch I) of JNSM and APIPL has been selected as promoter cum developer by SECI through a competitive bidding for VGF funding and has signed a power purchase agreement. As per the terms set by SECI in the PPA, the promoter cum developer shall have to achieve financial closure by October 2014 (210 days from date of PPA) and commission the subproject by April 30, 2015 (390 days from date of PPA).

C. Sub Project Developer

8. APIPL, the promoter cum developer for this subproject by SECI, is one of the leading independent solar power producers in India and presently has over 50 MW solar power projects in operation across Rajasthan, Gujarat and Punjab states under various policies for grid connected, rooftops and off-grid systems in the country and has invested significant capital for its operations in India.

9. APIPL has successfully commissioned and operating 2MW and 40MW solar PV power projects in Punjab and Rajasthan states respectively under Phase I JNNSM. APIPL has also commissioned 10MW and 5MW solar PV power projects in Gujarat under Gujarat State Solar Policy.

10. Under Phase II (Batch I) JNNSM, APIPL has signed PPA to develop 100 MW solar power projects in three different configurations, each with 40 MW, 20 MW and 40MW in Rajasthan. The present subproject is one such module of 40 MW allotted to APIPL to be developed near Hardhani and Nandiya Kalan Village, Jodhpur District, Rajasthan.

11. APIPL is promoted by Azure Power Inc and other investors like IFC (International Finance Corporation) and venture funds Helion Ventures Partners and FC VI India Ventures.

12. APIPL has incorporated a subsidiary M/s Azure Clean Energy Private Limited as an SPV (special purpose vehicle) to construct and operate the present subproject of 40 MW near Hardhani and Nandiya Kalan Village, Baori Tehsil, Jodhpur District, Rajasthan.

D. Sub Project Financial Closure

13. APIPL through its subsidiary M/s Azure Clean Energy Private Limited has sought term loan from IREDA (Indian Renewable Energy Development Agency Limited) in order to achieve the financial closure, which can lead to construction and commissioning of the 40

MW solar power project at near Hardhani and Nandiya Kalan village, Rajasthan in accordance with the PPA agreement entered with SECI.

14. IREDA is a Public Limited Government Company established in 1987, under the administrative control of MNRE (Ministry of New and Renewable Energy), GoI to promote, develop and extend financial assistance for renewable energy and energy efficiency/conservation projects. The corporate objectives of IREDA are:

- To give financial support to specific projects and schemes for generating electricity and / or energy through new and renewable sources and conserving energy through energy efficiency
- To increase IREDA's share in the renewable energy sector by way of innovative financing
- To strive to be competitive institution through customer satisfaction.
- To maintain its position as a leading organization to provide efficient and effective financing in renewable energy and energy efficiency / conservation projects.
- Improvement in the efficiency of services provided to customers through continual improvement of systems, processes and resources.

15. In line with its corporate objectives, IREDA is considering to finance the subproject based on Cd Te technology, being developed by APIPL through its subsidiary M/s Azure Clean Energy Private Limited. The estimated cost of the subproject is INR 270.78 crores (US$ 43 million) and the loan being processed by IREDA for subproject is INR 205 crores (US$ 32.5 million).

16. At the request of GoI, ADB is processing a loan to IREDA under the Clean Energy Investment Program to augment the efforts of IREDA in financing and promoting the renewal energy projects including the solar power projects. The present 40 MW subproject near Hardhani and Nandiya Kalan village is one of the several projects that IREDA is contemplating to finance under ADB Line of Credit (LoC).

E. Present Status of Subproject

17. Rajasthan Renewable Energy Corporation Limited (RRECL), Government of Rajasthan, nodal agency of the State Government for Solar Power Development has allotted 140 hectares (350 acres) of land for the subproject near village Hardhani and Nandiya Kalan Villages in Baori Tehsil in Jodhpur district as per the state solar energy policy.

18. The site allotted for the subproject is in proximity to two other solar power projects of 40 and 20 MW, which is also being set up by APIPL, through separate SPVs namely, Azure Green Tech Private Limited and Azure Sunshine Private Limited. These 40 MW and 20 MW projects are based on poly crystalline technology and have been allotted 101 Ha (250 acres) and 50 Ha (125 acres) land, which is also within the Hardhani and Nandiya Kalan village limits as of the subproject. Location Plan of all three Solar Projects with cumulative capacity of 100 MW are shown in **Annexure 1**.

19. Azure Clean Energy Private Limited, the SPV for construction and operation of the

subproject had initiated the topographical surveys, geo-technical investigations, project preparation and commenced the construction works in August 2014 with a schedule to commission the subproject by April 30, 2015, terms set out in PPA.

20. Visit to the subproject site for safeguards due diligence by the environmental and social specialists between April 20 to 25, 2015 indicated that all construction works were complete and subproject was under trial run for testing and commissioning by April 28 as against April 30, 2015, scheduled in the PPA.

21. The solar power generated by the subproject will be evacuated through a 132 KV transmission line to 400 KV Bhawad sub-station of Rajasthan Rajya Vidyut Prasaran Nigam Limited (RVPNL) located at about 25 km from the subproject. The construction of 25 km long transmission line has been completed and serves for the power evacuation of 40 MW from the subproject as well as the power from two other 40 and 20 MW solar projects, which are in proximity to subproject. The route alignment of transmission lines is given in **Annexure 2**

22. The 25 km long transmission line is supported on 85 towers, fabricated from fully galvanized mild steel or/and high tensile steel sections and of self-supporting lattice steel frames designed to carry the line conductors with necessary insulators, earth wires and all other fittings for all loading conditions to evacuate 100 MW of cumulative power from three solar power plants.

F. Applicable Environmental Safeguards Policies and Regulatory Framework

I. GoI India Regulatory Framework

23. As per the current regulatory framework, the subproject is exempted from the purview of EIA notification, 2006 as per circular issued by the MoEF (Ministry of Environment, Forests and Climate Change), GoI and therefore will not require any environmental clearances either at the centre from MoEF or at the state level from the SEIA (State Environmental Impact Assessment Authority). The notification by MoEF exempting the solar power projects from prior environmental clearances is given in **Annexure 3**.

24. The subproject will not require any clearances under the Indian Forest Act, 1927 and Forest (Conservation) Act, 1980, since the land allotted to the subproject does not involve any diversion of forest land.

25. At the State level, the subproject will require CTE (consent to establish) and CTO (consent to operate) from the State Pollution Control Board under the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981.

26. Other than this, the subproject will not require any other regulatory approvals either at state or central levels.

II. ADBs Safeguards Policy and Requirements

27. IREDA's mandate is to minimize the energy sector's negative environmental impact by promoting cleaner and more environmentally friendly technologies, and thus is committed to avoid and mitigate adverse environmental impacts, if any, resulting from the projects it

finances.

28. IREDA has agreed upon an Environmental and Social Safeguard Unit (ESSU) with ADB and to ensure all sub projects financed by IREDA through ADB LoC are compliant to ADB Safeguard Policy Statement (SPS) 2009.

29. Presently, IREDA is considering to finance the subproject through the ADB LoC and therefore an environmental safeguard due diligence (ESDD) of the subproject has been conducted in accordance with the EESU and presented in this report.

III. Scope and Methodology for Environmental Safeguards Due Diligence

30. The ESDD of the subproject has been carried out as per the laid down procedures in the ESSU agreed upon with ADB. The scope and methodology adopted for ESDD is briefly described hereunder

31. **Documents Review:** The documents review for conducting ESDD comprised;

- Review of subproject related documents like PIM (Project Information Memorandum), IREDA's loan processing file containing all project related information (from loan application to loan approval stage)
- Review of SEIA, prepared for the subproject by subproject promoter cum developer i.e. APIPL
- Discussions with the sector specific team within IREDA, involved in the appraisal and loan processing of the subproject
- Discussions with the subproject developers, explaining the need and scope of safeguards due diligence, and seek additional information, wherever required but not available in the PIM or loan processing files at IREDA for preparing ESDD.
- Desk review of secondary environmental baseline data from authentic and published sources

32. The review of documents and meeting with subproject developer as part of the ESDD was carried out at IREDA's office on various dates prior to site visit in the month April 2015.

33. **Site Visit:** In co-ordination with IREDA, field visit was undertaken by both environmental and social safeguards specialists to the subproject site once between August 20 to 25, 2014 during pre-construction stage and between April 20 to 25, 2015, for assessing the physical progress of subproject construction. The representatives of the promoters/developers accompanied the safeguard specialists to the subproject site and responded to all on site queries.

G. Environmental Safeguards Due Diligence

34. Based on the documents review, site visit and desk review of secondary data from published sources, environmental safeguards due diligence was carried out. The findings of the due diligence as well as the environmental sensitivity of the subproject is given hereunder

- The subproject developer has been allotted 140 hectares (approx 350 acres) of land near Hardhani and Nandiya Kalan Villages in Baori Tehsil, Jodhpur district, Rajasthan to construct and operate a solar power plant of 40 MW capacity by RRECL as per the state Solar Energy Policy. The land allotment letter to the subproject developer is given in **Annexure 5**. The letter of intent issued by SECI to APIPL for signing of power purchase agreement (PPA) is given in **Annexure 6**. The same developer/promoter also has been allotted land for setting up two more solar power projects (101 Ha land for 40MW and 50 Ha land for 20MW) in the same village limits. These two projects are also slated for commissioning by April 30, 2015, likewise of subproject.
- The 140 Ha of land allotted for the subproject was a barren, non-agricultural government land with sporadic patches of xerophytic vegetation (Acasia Sp.), typically found in areas receiving less than 600 mm of rainfall in a year. The site allotted had no human habitation or any other encumbrances. Photographs of subproject site are given in **Annexure 7**.
- The sub project site does not require felling of any trees and therefore no permissions are required for tree felling or site clearance activities in the pre-construction stage.
- The subproject site is connected to the National Highway (NH 65) through a 12 km long all weather bituminous road. The nearest rail and air connectivity is 70 km away at Jodhpur city.
- The entire region/area surrounding the subproject is most suitable for solar power generation with more than 300 sunny days in a year and an estimated solar radiation of about 5.65Kwh/sq-m/day. As per the assessment of US Department of Energy, Rajasthan state as a whole and entire region/area surrounding the sub project within Jodhpur district receives the second largest amount of solar radiation in the world and is best suited for solar power generation.
- The subproject is exempted from purview of EIA notification, 2006 and therefore will not require any environmental clearances from the MoEF either at the centre or from the SEIA at the state level. The notification by MoEF exempting the solar power projects from prior environmental clearances is given in **Annexure 3**. The subproject has received the CTE and CTO from the State Pollution Control Board (**Ref Annexure 4**). The construction of power transmission lines for the subproject will not require any forest clearances as it does not pass through such areas.
- Although the subproject will not require/warrant an SEIA preparation as per regulatory requirement, the developer has prepared SEIA report through an independent agency as part of its corporate governance framework as well as to comply with the requirements of promoter's co-investors like IFC, venture fund houses among others. Copy of SEIA report is included as **Annexure 8** to this report.
- The subproject does not fall under the ADB prohibited list of activities given in **Annexure 9**.
- A rapid environmental assessment of the subproject using the REA checklist and environmental categorization (attachment 3 & 4 of ESSU) was carried based on the

documents review including the SEIA supplemented by site visits for ground truth verification. The filled-in REA checklists and environmental categorization form are given in **Annexure 10**.

- Based on the filled-in REA checklists and environmental categorization, the subproject can be classified as Category B, as the impacts due to construction are largely limited to subproject site itself and such impacts can be controlled/mitigated through site specific measures. The independent SEIA for the subproject has also categorized the sub-project as Category B, following IFC norms.
- The subproject has no National Park or Wildlife Sanctuary or ecologically sensitive areas within a radius of 10 km.
- The subproject site is not reported to be falling along the migrant route any threatened/protected wildlife. Occurrence of rare and/or endangered (both flora and fauna) species has not been reported in and around the subproject area/region.
- No archeological or historical monuments, protected by Archeological Survey of India or from the State Government have been reported in and around the sub project site as well as within a radius of 10 km. The subproject construction will not impact any religious structures or worship places or places of importance/value to the local populace.
- No perennial or seasonal rivers/streams flow within a region of 10 km radius surrounding the sub project site. Luni, a seasonal river flows at a distance of 110 km from the sub project site.
- The power evacuation and transmission from the subproject will be through a 25 km long 132 KV transmission line connected to a 400KV Bhawad substation. The 25 Km long transmission line with 95 towers has been aligned to follow barren government land and avoid private cultivatable land or habitations whatsoever. Despite this, out of the 95 towers, 20 towers are constructed on private land and land owners have been funded with a mutually accepted compensation. The Social Safeguards due diligence report provide the more details on entitlement and disbursed compensation to private land owners. During the visit to subproject between 20th and 25th April 2015, the transmission line was under testing as part of the preparedness for commissioning of subproject by April 28, 2015.
- The project region present ample opportunity to avoid social impacts since vast tracts of barren land either government or private is available in the region. The due diligence of social issues relating to the transmission line is included in the Social Safeguards due diligence report.
- The impacts arising due to the construction activities at the subproject site are largely confined to site and can be mitigated through a site specific environmental management plan. The SEIA has included a site specific environment management plan for the sub project. The subproject also had a site specific environmental management plan, on site emergency preparedness plan and a Safety, Health and Environment Management (SHE) plan for the construction phase.
- These plans are implemented at subproject site through a designated SHE officer under the direct monitoring and management from the SHE department at the

developer's corporate office. The SEIA report also has included a developer's corporate organogram (**Ref Annexure 11**) for its SHE team, which is responsible for monitoring the environmental and social issues of all their projects including the present subproject at all stages of project implementation and operation phases. The onsite emergency preparedness plan, site specific environment management plan and a recent weekly SHE monitoring report is attached as **Annexure 12**.

- As assessed during field visit, the construction of the subproject facility did not involve any significant earth work excavation/filling or major construction activities, except for site clearance and marginal grading activities to even out and level the ground for installing solar PV panels on prefabricated metallic frames. The subproject is accessible through all weather roads and did not require/involve construction of new haul roads for transportation of construction materials. The limited site specific impacts like dust, noise, disposal of construction waste, on site sanitation facilities for construction force, were handled through mitigation measures included in the SEIA report and good engineering practices.
- The SEIA has estimated the construction and operation phase water requirements as 3600KL and 21 KLD respectively, which is sourced from existing wells around the subproject site and brought to site through water tankers. This is strictly adhered as the sub project and Jodhpur district as a whole fall under the over exploited category and therefore fresh development of ground water sources are regulated and no new tube wells can be constructed. Considering this regulation, the sub project has already considered mopping with wet micro fibers for periodic cleaning of solar PV panels instead of hydrant and sprinkler network, which require comparatively more water. Photographs showing cleaning of panels through wiping method in a nearby operational solar power plant of the same developer are given in **Annexure 13**.
- The SEIA for the subproject has earmarked a budgetary provision of INR 21 lakhs (US$ 35,000) for environmental and social management plan including periodical environmental monitoring during the construction and operational phase of the subproject.

H. Further Actions Required

35. The ESDD indicated the requirement of following further actions for the subproject

- The subproject developer has to ensure deployment of adequate human and financial resources for on-site environmental management and comply with all consent conditions stipulated in the CTE and CTO from the RSPCB in a timely manner, document and submit annual regulatory compliance reports to RSPCB as well as quarterly progress reports to IREDA.
- The ESSU cell at IREDA will monitor implementation of the environmental and social management plan through developer's periodic environmental monitoring progress reports and undertake bi-annual due diligence visits to ensure satisfactory implementation of environmental management plans at all stages of subproject.

I. Conclusion and Recommendations

36. The conclusions of the ESDD for the subproject are:

- This subproject has been prepared by the subproject developer as per their own investment plan supplemented by IREDA's loan assistance but not in anticipation of availability of funds to subproject thereafter IREDA's LoC from ADB.
- The construction and operation of the 40 MW solar power project near Hardhani and Nandiya Kalan village, Baori Tehsil, Jodhpur district have no major significant environmental issues. The subproject has an environmental management plan for mitigating site specific impacts during construction and operation phases.
- The subject has earmarked a budgetary provision of INR 21 lakhs (US$ 35,000) for the environmental and social management plan including a periodical environmental monitoring program for both construction and operation phases.
- IREDA, through its ESSU cell is committed to monitor the implementation of Environmental and Social Management Plan at subproject site through developer's periodic progress reports and undertake bi-annual due diligence visits to subproject site during construction and operation phases and assess the implementation of environmental management and environmental monitoring being carried out by the developer.
- The current subproject will be in compliance to ADB Safeguard Policy Statement (SPS) 2009 and does not pose reputational risk to ADB funding on environmental safeguards.

PART II

SOCIAL SAFEGUARDS DUE DILIGENCE REPORT

SOCIAL DUE DILIGENCE REPORT

Subproject: 40 MW Solar Photovoltaic Power Plant at Nandiya Kalan & Hardhani Village in Baori Tehsils of Jodhpur District in the State of Rajasthan

Developer: Azure Clean Energy Private Limited

1. Introduction

Indian Renewable Energy Development Agency Limited (IREDA) is the single largest renewable energy financier in India and applied for ADB loan to fund as a part of its overall lending portfolio, to private sector renewable energy and energy efficiency subprojects in India, including small scale wind, biomass, small hydro, solar, cogeneration, and energy efficiency.

IREDA's mandate is to minimize the energy sector's negative environmental impact by promoting cleaner and more environmentally friendly technologies, and thus is committed to avoid and mitigate adverse environmental impacts, if any, resulting from the projects it finances. In order to identify and effectively address potential impacts from projects funded with the ADB line of credit, IREDA has formulated and adopted an Environment and Social Safeguard Unit (ESSU), which is in compliance with Indian national laws and Asian Development Bank (ADB) Safeguard Policy Statement (SPS) 2009. The objective of the ESSU is to guide IREDA's actions to safeguard against adverse environmental and social impacts for sub-projects using ADB's funds.

Keeping in view the main objective of the ESSU, ADB social safeguard requirements and in confirmation with the national and local policy and legal framework, a social due diligence study has been carried out for the subproject i.e. 40 MW solar photovoltaic power plant in Rajasthan being promoted by Azure Clean Energy Private Limited.

2. Subproject Description

The proposed subproject is consists of a 40 MW solar photovoltaic power plant at Nandiya Kalan and Hardhani village in Baori Tehsils of Jodhpur District in the State of Rajasthan. Azure Green Tech Private Limited, one of the SPV created by Azure Power India Pvt. Ltd, is promoting the subproject.

The proposed project is based on solar photovoltaic technology using Thin Film Cadmium Telluride (CdTe) PV modules for power generation. The grid connected solar photovoltaic (PV) plant will primarily comprise of PV modules and arrays, module mounting structures, invertors, remote monitoring and data acquisition, medium voltage station transformers, and transmission lines. Solar generated power will be evacuated through a 25 km long transmission line, which will connect the project to 220 KV Grid substations at Bhawad.

Azure Power India Pvt. Ltd. is promoting another two subprojects in the same location in the name of Azure Green Tech Pvt. Ltd. and Azure Sun Shine Pvt. Ltd. for 40MW and 20MW subsequently.

3. Scope of Review and Methodology

This social due diligence report is prepared based on review of various subproject documents, consultation with developers, field staff and on site observation. The documents reviewed for the subproject includes Detailed Project Report (DPR), Environmental and Social Impact Assessment (ESIA) Report and Pre Sanction Inception report prepared by IREDA. Site visit were conducted initially during August-2014 at pre-construction stage and subsequently in April-2015 at operation stage and consulted with the field staff of Project Developer.

The ESIA study for the proposed project has been conducted as per applicable national regulations in India. The study entails collection and collation of baseline environmental and socio-economic information of the study area, assessment of potential project level environmental and social impacts and development of project specific mitigation and management plans.

4. Social Safeguard Categorization and Rationale

On the basis of the review of project information and site observation, the Social Safeguard Screening Checklist (refer **Annexure 10**) was completed as per the requirement set forth in the ESSU. Based on the social safeguard checklist, it was established that the subproject is categorized as "Category-C" from both Involuntary Resettlement and Indigenous Peoples safeguard point of view. The Involuntary Resettlement Categorization form and the Indigenous Peoples Categorization form are attached in **Annexure 10**.

The rationale behind the social safeguard categorization as "C" i.e. the subproject does not require any further specific actions so far as the social safeguard point of view is because the subproject does not involve any involuntary acquisition of private land and does not have any negative impacts on people including indigenous community. The Government land used for the subproject was also free of any encumbrances and being unused barren land, it is not serving any interest of the local people or nobody is dependent on it. For transmission line also mostly government land were utilized and few tower locations are falling on private land for which Azure has hired on lease basis by paying negotiated price to the landholders based on type and use of land. The photograph of the subproject site before construction is presented below in **Figure-1**.

Figure-1: Photograph of the subproject site

5. Social Safeguard Issues under the Subproject

The social safeguard issues identified through the social due diligence process is discussed in the following section.

5.1 Land Acquisition Requirement under the Subproject

On the basis of requisition made by the Energy Department, Government of Rajasthan, the District Collector, Jodhpur exercising his power to allot government land in confirmation with Rajasthan Land Revenue (allotment of land for setting up of power plant) Rules 2007 has already allocated 140 hectares of land for this subproject. The land allotment letter issued by the District Collector, Jodhpur is attached in **Annexure 5**. In the same vicinity, Azure Power has been allotted with another 100 hectares of land for Azure Green Tech subproject and 50 hectares of land for Azure Sun Shine subproject.

Azure Power has signed a Power Purchase Agreement (PPA) with the Government of Rajasthan for 25 years. The subproject has already commissioned in April 2015. The approval for transmission line given by the Government of Rajasthan, Electricity Department has been attached in **Annexure 14**

The transmission line is having total length of 25 kilometers consisting of 98 towers. This transmission line serves for another two subprojects i.e. 40MW Azure Green Tech subproject and 20MW Azure Sun Shine subproject. The transmission alignment is laid mostly on government land minimizing negative social impacts. The details of lease/compensation amount of Rs. 1,17,31,815 (11.73 million Rupees) paid for 15 landowners for 31 towers falling on private land are attached in **Annexure 15**.

5.2 Involuntary Resettlement Issues under the Subproject

Since there is no private land acquisition required for the subproject, there does not arise any issue of involuntary resettlement. The affected Government land is unused barren/rocky land and there is hardly any tree on the land. For the transmission line and towers falling in private land, Azure has procured private land by signing lease agreement and paying compensation/ lease amount for the same through negotiation.

5.3 Indigenous Peoples Issues under the Subproject

According to the Census of India 2011 statistics, Scheduled Tribe (ST) population of Jodhpur district is only 2.75%. No indigenous people are present in the subproject area and therefore no such issue has been identified for the subproject.

6. Public Consultation under the Subproject

During various stages of subproject preparation, public consultation meetings were carried out involving various stakeholders. The stakeholders engaged in the consultation process included village *panchayat*, village community, landowners falling in the transmission line alignment, local administration, revenue officers, and various line departments. In addition to the social safeguard issues discussed in the above sections, some of the other relevant subproject specific issues such as subproject benefit, community participation, CSR policy and activities and grievance redress mechanism etc. discussed during the consultation. The ESIA report prepared for the subproject was disclosed to the local community intimating through public

notice, displaying in *Tehsil* office and posting in the company website. The details of public consultation are documented in the ESIA report attached in **Annexure 8**.

7. Grievance Redress Mechanism for the Subproject

To establish and implement a system to identify and take necessary steps to provide an effective approach for complaints and resolution of issues made by the affected community in reliable way, a grievance redress mechanism is formulated and adopted by the developer. The grievance redress system is applicable across the all locations of Solar Power Projects and describes the procedure of grievance handling and their redress across the all units. It also specifies working regulations for Contractors / Service Providers / Vendors associated with the subproject. The functioning of grievance redress system is the responsibility of Project Head / HR & SHES Team and involves following steps.

STEP 1. LODGING OF GRIEVANCE

The Complainant can lodge his Grievance with any of the following:

- Complaint/Grievance received from the above said sources will be maintained under the responsibility of Azure and logged out in the grievance form/register available on demand from the security room at the entire project site. Project staff shall assist community members who are not able to fill out the form by themselves.
- Compliant/grievance Shall not be disclosed to the external environment if the party desired to do so.
- A properly completed Grievance must be submitted in order to register a grievance. As outlined above, Project personnel will assist community members where required to complete a Grievance Form. The Grievant will be given a copy of the completed Grievant Form for his/her records.
- Telephone Numbers:(Working hours: 10 am to 6 pm) 011-49209803 (Accessible from any Mobile and Landline within India)

STEP 2. PROCESSING GRIEVANCE

Complaint and Grievance Cell: The committee will be responsible for handling, management and redress of all grievance received which will be formed. Any grievance received in any mode (grievance form, letters, phone calls, etc.) shall be referred to the committee within 24 hours from the time of the receipt of the complaint. The committee shall follow the procedures for resolving the complaint as given below.

- A written acknowledgement shall be sent to the Complainant within three (3) working days from the date of receipt of any complaint/grievance.
- The committee shall communicate the acceptance along with the acknowledgement.
- All complaints received by the committee shall be forwarded to the manager responsible immediately.
- In case of additional requirements raised, the project staff shall interact with the Complainant for the document requirements and upon receipt shall forward the documents to committee.

STEP 3. GRIVENCE RESOLUTION

The committee shall endeavor to resolve the complaint/grievance within (ten) 10 working days from the date of receipt of the complaint/grievance. The committee shall communicate the company's decision and the same would inter-alia contain the following:

- Resolution and the details of the resolution offered or reasons of rejection.
- Process to pursue further, if the customer is dissatisfied with the resolution.

The committee shall treat the complaint/grievance as closed if there is no response from the complainant to the communication sent by the company, within 10 from the date of receipt of the said communication.

STEP 4. CLOSURE OF GRIEVENCE

The committee shall consider the complaint as disposed of and closed when.

- The committee has resolved to the request of the complainant fully.
- Where the complainant has indicated in writing, acceptance of the response of the company.
- Where the complainant has not responded to the company within 8 weeks of the company's written response.
- Where the grievance redress officer or management has certified that the committee has discharged its contractual, statutory and regulatory obligations and therefore closes the complaint.

8. Community Development Initiatives by the Subproject

The subproject has created employment opportunities for some local people and utilizing local resources in terms of employment of local laborers, hiring machines and manpower for transportation of materials and equipment during construction. During the site visit it was observed that local peoples are trained and engaged as security guards in the plant.

As a part of its corporate social responsibility (CSR) program, the developer has assessed some local needs and indented the following activities to be taken up as a part of Community Development Plan for the villages near the plant and along the transmission line.

- Road shall be repaired and proper access shall be given. This will be used jointly with Azure and local villagers
- Basic infrastructure and amenities for school (school bags, note books, geometry box etc.) shall be given to students. Sitting benches should be provided in the nearby school. These benches can be prepared from the wooden material used for solar module packaging and will be considered during operation and maintenance phase.
- Medical facilities to be planned during operation and maintenance phase if required.
- Repairing of access road to temple and crematorium of the village near the plan

The developer has already initiated some of the community development initiatives like supplying of kits to school children, repairing and maintenance of common road used for the plant and villages and organizing health check-up camps in the villages etc. The SHES department of Azure has a system of monitoring of the community development plan formulated

for the subproject. A photograph showing the approach road connecting the temple and crematorium developed by the project developer is presented in the Figure: 2.

Figure-1: Photograph of the subproject site

The community development plan suggested under the CSR activities of the developer is attached in **Annexure 16.**

9. Conclusion and Recommendations

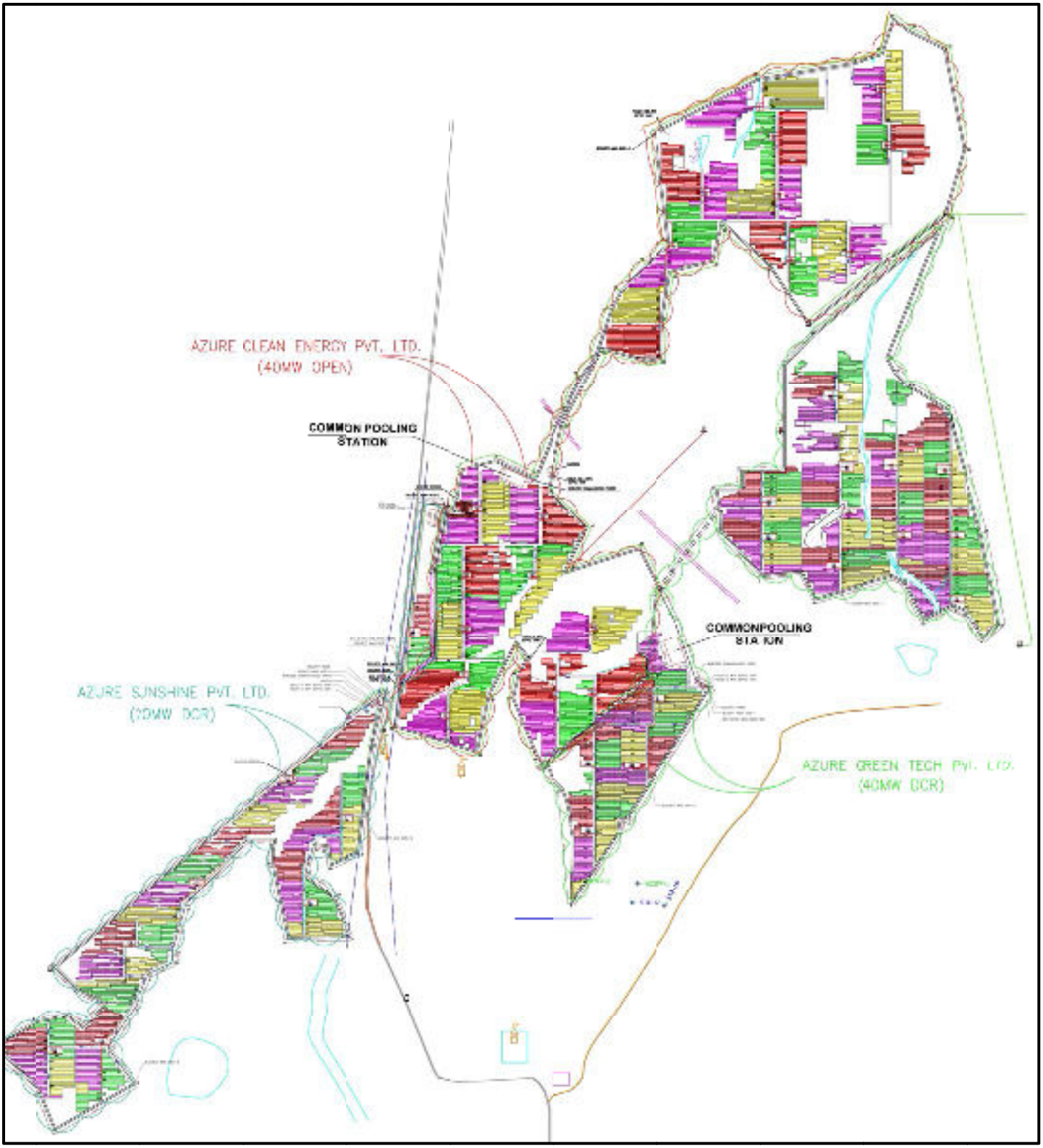
The social due diligence study of current subproject reveals that there will not be any adverse social impact due to the intervention. The subproject is categorized as Category "C" form social safeguard point of view. The private land required for the subproject is arranged through lease by paying compensation/ lease amount to the landowners and therefore no involuntary resettlement occurs.

Based on the findings of due diligence study the subproject is recommended for funding under the proposed project using ADB line of credit. If any change in scope will result in private land acquisition or loss of livelihood, the project developer will comply with the agreed social safeguard framework by the borrower.

IREDA will ensure compliance of ESSU and carry out periodic monitoring of the social safeguard issue and report to ADB as agreed in the ESSU.

Annexure 1

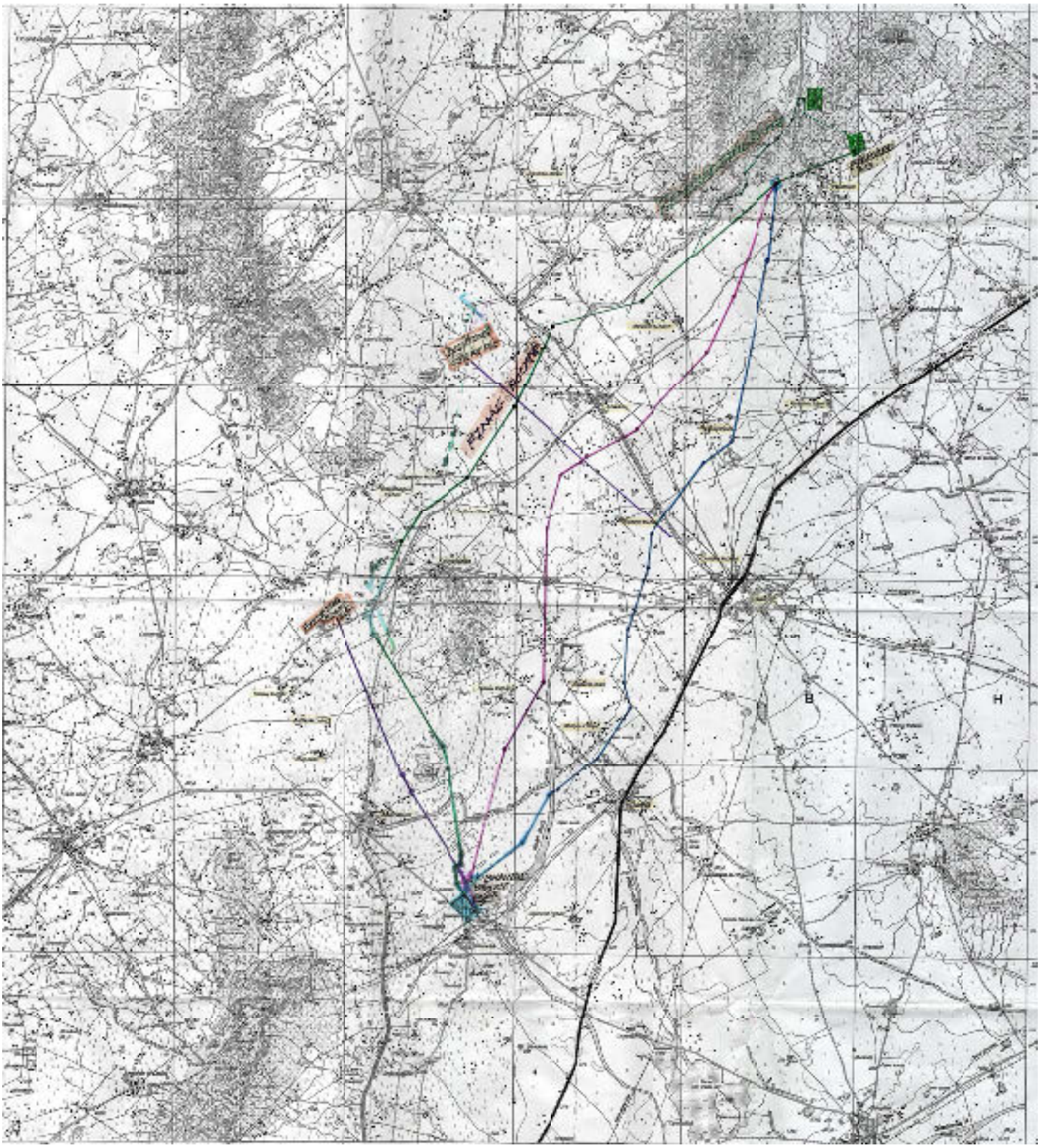
Location Plan of all three Solar Projects with cumulative capacity of 100MW



Location of 3 Solar Power Project (40 MW, 40 MW & 20 MW)

Annexure 2

Route Alignment of Transmission lines for Sub Project Site



Route Alignment of Transmission lines for Sub Project Site
(Shown on Survey of India Topomap)

Annexure 3

MoEF Letter Exempting Environmental Clearance for Solar Projects

No. J-11013/41/2006-IA.II(I)
Government of India
Ministry of Environment & Forests

Paryavaran Bhavan,
C.G.O. Complex, Lodi Road,
New Delhi-110003.
Telefax: 24362434

Dated the 30th June, 2011

OFFICE MEMORANDUM

Sub: Environment Clearance for setting up of Solar Thermal Power Plants under JNNSM – applicability of EIA Notification, 2006 – Regarding.

Ministry of New and Renewable Energy (MNRE) has brought to the notice of this Ministry that the State Pollution Control Boards have been asking for obtaining prior environment clearance in respect of Solar Thermal Power Projects as according to them, these projects get covered under Category 8(b) of the schedule to the EIA Notification, 2006. The matter has been examined in the Ministry of Environment & Forests, in the light of the technical and scientific information provided by MNRE vide their letter no. 29/1(1)/2011-12/JNNSM(ST) dated 22.6.2011 (copy enclosed).

2. It is clarified that Solar Thermal Power Projects are not covered by the provisions of EIA Notification, 2006. However, keeping in view the extent of land required for such projects, it has been decided that:

- State Pollution Control Board / UTPCC before issuing consent to establish under Air and Water Act to such units may ensure and satisfy themselves by undertaking a site visit that the proposed area does not involve; (i) any wet land, (ii) any agriculture land, (iii) ecologically sensitive area, (iv) areas rich in bio-diversity, (v) areas with large habitation. In case, any displacement of habitation is involved, the requisite R&R and CSR should be put in place as per the norms of the respective State Government. Further, if the area involves any forestland, it needs to be ensured that the requisite prior forestry clearance for diversion of forestland has also been obtained under FC Act.
- In addition, the site should also conform to the provisions of the CRZ Notification, 2011. Under the CRZ Notification, 2011, this activity will be prohibited in the CRZ area.
- It also needs to be ensured that the requisite prior commitment from the Competent Authority for availability of requisite quantity of water for the project is available with the proponent.
- The land so made available for the solar thermal power plant will not be deviated for any other purpose and no change of land use what so ever will be permitted without obtaining requisite clearance from the Competent Authority as applicable.
- All other clearances as may be applicable from other Regulatory Authorities under various Rules and Regulations inter-alia consent under HSM Rules etc. should be available before issue of consent by the SPCB.

3. Further, CPCB will, separately, make a study on some illustrative aspects of the actual environmental impacts of these Solar Thermal Power Plants and Solar Photovoltaic Plants with a view to report to MoEF during and after setting up of these plants i.e. construction phase and implementation phase. The SPCBs may also be kept involve in such studies to be undertaken by CPCB.

This issues with the approval of the Competent Authority.

(Dr. S.K. Aggarwal)
Director

To

1. Secretary, Ministry of New and Renewable Energy, Block no. 14, CGO Complex, Lodi Road, New Delhi-110 003.
2. All the Officers of IA Division
3. Chairpersons / Member Secretaries of all the SEIAAs/SEACs
4. Chairman, CPCB
5. Chairpersons / Member Secretaries of all SPCBs / UTPCCs

Copy to:-

1. PS to MEF
2. PPS to Secretary (E&F)
3. PPS to SS(JMM)
4. Advisor (NB)
5. Website, MoEF
6. Guard File

भारत सरकार
नवीन और नवीकरणीय ऊर्जा मंत्रालय
Government of India
MINISTRY OF NEW AND RENEWABLE ENERGY
ब्लाक नं. 14, केन्द्रीय कार्यालय परिसर, लोदी रोड, नई दिल्ली-110003
BLOCK NO. 14, C.G.O. COMPLEX, LODI ROAD, NEW DELHI - 110 003

Fax : 011-24361298
Telegram : RENEWABLE

सं.
No. 29/1(1)/2011-12/JNNSM(ST)

दिनांक
Dated 22/06/2011

Shri J. M. Mauskar
Special Secretary
Ministry of Environment of Forests
R. No. 412, 4th Floor, Paryavaran Bhawan,
CGO Complex, Lodhi Road, N.Delhi- 110003

Subject: Environment clearance for setting up Solar Thermal Power Plants under JNNSM

Sir,

The matter refers to the representation received from Forum for Advancement of Solar Thermal (FAST) dated 12/05/2011 regarding environmental clearance for solar power projects and subsequent discussions of the MNRE and MoEF. The information provided by the solar project developers has been examined in the Ministry and a note has been prepared that covers some aspects of the solar thermal power technology and information on the environmental aspects. The note is enclosed herewith.

2. It is recommended by the Ministry that the solar thermal power projects may be exempted from Environmental Clearance requirements as

i) Solar power is clean power and environment friendly.

ii) The land used for the project is not subjected to much change or development and most of the land is used for installing solar collectors only.

iii) There are no polluting emissions or discharges in air or water bodies.

3. Early consideration of the matter is requested in order to be able to meet stringent time schedule set for the Mission targets.

Tarun Kapoor
(Tarun Kapoor)
Joint Secretary (NSM)
011-24360359

Encl: As above

F. N. 29/1(1)/2011-12/JNNSM(ST)
Ministry of New and Renewable Energy

A Note on Solar Thermal Power Plants for Environmental Clearance

Main Features

The technology of solar thermal power generation is based on the principle of producing steam by concentrating the solar radiation from a large area onto a smaller area and then turning a turbine in similar fashion as in a conventional thermal plant. The solar field, thus, is a replacement of the boilers or heaters using fossil fuels in a conventional thermal plant with balance of system remaining similar. In solar dish-Stirling technology, power is produced directly using concentrated solar heat in a Stirling engine, which is an external combustion engine.

Solar thermal power plants were built during late eighties in USA and these plants are still working to produce power. There have been a steep growth in this sector in the last couple of years and substantial capacities have been installed, especially in Spain. Presently, over 1200 MW capacity solar thermal power plants are in operation globally, and around 2000 MW capacity plants are under construction. The technology has been proven and has enormous potential for the locations blessed with solar energy.

India, located in subtropical zone has plenty of sunshine in most parts and for very good number of days in the year, and therefore, solar technologies have high relevance. This is the background to prompt Government of India to launch Jawaharlal Nehru National Solar Mission, which is one of the eight missions as a part of National Action Plan on Climate Change. This note discusses various features of solar thermal power for the purpose of environmental clearance.

Major Solar Thermal Technologies

The four most promising solar thermal technologies are parabolic trough, central receiver or solar tower, parabolic dish and Linear Fresnel collectors. The parabolic trough and linear Fresnel technologies have a line focus, whereas other two technologies have a point focus. Typically, concentration ratio for a line focusing technology is in the range of 80 and solar power plants based on these technologies operate at about 400 deg C or below. Comparatively, the conventional thermal plants operate at much higher temperatures than this. The technologies based on the principle of point focus may have higher concentration ratios, and therefore, the higher operating temperatures. Parabolic trough technology has been in commercial space for many years now, and a large number of power plants around the world, especially Spain, are being built based on this technology. Other technology configurations, which are getting attention from the developers, include solar towers, CLFR and dish-Stirling.

Solar Thermal Storage Plants

Solar heat collected during the day can be stored in the form of molten salts or other suitable media. The stored heat is used to generate power during periods of low sunshine or night. World over, about 20 plants have been constructed using thermal storage. This includes 50 MWe Andasol plants in Spain, which are designed with six to eight hours of thermal storage. The capacity utilization factor (CUF) of a solar plant without storage ranges in between 20-23% depending upon availability of solar radiation at the site and the efficiency of the technology selected for conversion of solar energy to heat. The CUF increases for solar plants incorporating thermal storage.

Use of Auxiliary Energy

As per JNNSM guidelines, the solar thermal power plants are allowed to use 10% of the energy generated from the plant for auxiliary energy consumption, while balance of the generated power is to be fed to the grid for availing tariff. However, solar thermal power plants may require some operations to be performed during evening/ night, especially the plants designed to have thermal storage. Some energy will be required for these operations from the grid. The overall requirement of this energy will be only a small fraction (about 1-2%) of the nameplate rating of the plant.

Water Requirements

A typical solar thermal power plant has a cooling cycle, which is similar to that used in conventional thermal plants. The requirement of water on per unit basis is at the similar levels, however, total water requirement on a capacity basis is 60-70% less due to lower capacity utilization factor. These plants, like conventional plants, may be designed to have air-cooled or wet cooled systems, or a combination of the two. A comparative water requirement of thermal power projects based on different technologies is given below.

Technology	Cooling	Litres/MWhr
Coal/ Nuclear	Once-through	87400-102600
	Recirculating	1520 - 2850
	Air cooling	190-250
Natural Gas	Recirculating	760
Solar tower	Recirculating	1900-2800
	Hybrid	340-950
	Air cooling	340
Parabolic trough	Recirculating	3000
	Hybrid	380-1700
	Air cooling	300
Solar Dish/Engine	Mirror washing	76
Linear Fresnel	Recirculating	3800

Reference *Concentrating Solar Power Commercial Application Study: Reducing Water Consumption of Concentrating Solar Power Electricity Generation, Report to Congress, U.S. Department of Energy*

Area Requirement

Solar thermal power plant typically requires an area of about 2.0 to 2.5 hectare per MW capacity depending upon plant configuration, site, and thermal storage etc. The land is mainly used for installing solar collectors in an open environment. The built up area for covered construction is approximately 600 square meters for a 100 MW plant, which is required to locate the steam turbine and the control room.

The guidelines for solar thermal power projects under phase 1 of the JNNSM, stipulated 20 MW and 100 MW as the minimum and maximum capacity.

Land Development Activities

The land areas where solar power projects will be located would typically be represented by arid and non-farming land. The land areas that would have severe slopes, natural drainage courses, environmentally sensitive zones, forests and bio-reserves are not suitable for setting up these projects. It is assessed *(solareis.anl.gov/documents/dpeis/Solar_DPEIS_**Appendix_M**.pdf)* that overall effect would not be detectable or would be so minor that they would neither destabilize nor noticeably alter any important attribute of the land resource.

The potential construction and operation impact of Solar Thermal Power Plants, as inferred from the literature (http://www.energy.ca.gov/sitingcases) is as follows:

Activity	Potential Impact
Pre-construction Phase Site mobilization - Includes installation of fencing, and provision of utilities	This involves minimal ground disturbance and is not expected to impact environment and ecology of the site
Construction Phase This includes grading, boring for pylons and support structures, trenching and other sub-surface soil work at site for access roads and building of project facilities.	The impact of these activities is minimal as the affected site area is very small as compared to total land area. The impact is limited to the construction phase only. The prominent land features are expected to be naturally restored after completion of construction activity.
Operation Phase	The project does not produce any effluents and polluting gases. Water is required for generating steam in a closed cycle and for washing and cleaning of mirrors. Water will be accessed from the sources allocated by the respective State governments and do not involve use of ground water

Jawaharlal Nehru National Solar Mission

The Government launched the Jawaharlal Nehru National Solar Mission (JNNSM) on 11th January 2010 with an objective to establish India as a global leader in solar energy, by creating policy conditions for its diffusion across the country quickly and achieve a scale to drive down costs to levels required to achieve grid parity by 2022. The targets of the Mission include deployment of 20,000 MW of grid connected solar power by 2022. The Mission will be implemented in three phases.

For the Phase 1 of the Mission, a target of 1,100 MW grid connected solar plants has been set up, which includes 100 MW plants as rooftop and other small solar power plants till March 2013. 704 MW capacity grid connected solar power projects were selected by December, 2010, which comprises of 500 MW solar thermal and 204 MW PV power projects. The remaining capacity will be selected during the year.

Environment Aspects of Solar Power

Solar energy is one of the most abundant sources of clean, renewable energy. Unlike fossil fuel based power generation, solar energy does not have any harmful emissions like CO2, SOX, NOX etc.

The pollutants commonly emitted from fossil fuel power plants—greenhouse gases such as carbon dioxide, among others—are completely absent from the solar thermal power projects. Unlike fossil-fuel power generation, solar thermal power plants do not produce any toxic emissions, such as mercury, smog-forming chemicals and particulate "soot." Mercury contaminates our water supply and food chain, and can result in health problems, particularly in developing fetuses. Solar thermal power plants do not emit any particulate matter and ozone that damage air quality. A comparison between solar thermal and conventional power plants is as follows:

Sl #	Air Quality impact	Thermal power	Combined cycle	ST Power
1	SPM - Suspended Particulate Matter	Yes	No	No
2	RPM - Respirable Particulate Matter	Yes	No	No
3	SO2	Yes	No	No
4	Nox	Yes	Yes	No

Sl #	Water quality impact	Thermal power	Combined cycle	ST Power
1	Boiler blowdown	Yes	Yes	Low
2	Ash pond effluent	Yes	No	No
3	Cooling water blow-down	Yes	Yes	Low

Sl #	Soil quality impact	Thermal power	Combined cycle	ST Power
1	On-site hazardous waste storage	Yes	No	No
2	Ash disposal site	Yes	No	No

International Energy Agency assesses that over a CSP plant's entire life-cycle, it will produce 30 times less carbon dioxide per unit of power produced than a coal-fired power plant and 13 times less than a modern natural gas-fired power plant (www.iea.org/textbase/ papers/2002/renewable.pdf).

Proposal

Solar Projects do not fall under the list of projects/ activities requiring prior Environmental Clearance as per the EIA Notification of 2006. However, in a recent development, when large Solar projects have approached the respective State Pollution Control Board for Consent to Establish, they have been classified under category 8 (b) of List of projects as per above notification and instructed to obtain EC.

As per the said notification, category 8 (b) covers Townships and Area Development projects covering an area > 50 ha and/or built up area > 1,50,000 sq. mtrs. All projects under this category further fall under category 'B1' requiring preparation of an EIA report for clearance by the State Environmental Impact Assessment Authority (SEIAA).

As mentioned above, solar thermal technology uses land mainly for putting up solar collectors, which are open to the sky. The built up area for covered construction is very small compared to the threshold limit of 150,000 square meters, even under category 8(b). These plants have minimal O&M requirements and the requirement of operations staff is small. So a large solar plant irrespective of area occupied should not be considered as a township or an area development project.

Considering these facts and the non-polluting and environmental friendly nature of Solar Projects, it is proposed that solar thermal power projects may be exempted from Environmental Clearance requirements.

Annexure 4

Copies of CTE ant CTOs issued to other Solar Projects by RSPCB

Regional Office Jodhpur
Rajasthan State Pollution Control Board
SPL-I, Phase-I, Basni Ind. Area, Jodhpur
Phone: 0291-2723225
www.rpcb.nic.in
Registered

File No : F(Tech)/Jodhpur(Phalodi)/109(1)/2012-2013/999-1001
Order No : 2012-2013/Jodhpur/731 Dispatch Date: 24/08/2012

M/s Welspun Solar AP Pvt. Ltd.

7th Floor, Kamla City, Senapati Bapat Marg, , Lower Parel (W), MUMBAI

Sub: **Consent to Establish** under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974.

Ref: Your application(s) for Consent to Establish dated 02/07/2012 and subsequent correspondence.

Sir,

Consent to Establish under the provisions of section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 (hereinafter to be referred as the Water Act) as amended to date and rules & the orders issued thereunder **,is hereby** granted for your **Solar Power (PV) plant** situated / proposed at **Khasra No. - 1627 & Khasra No. - 17, Vill.- Srimandrup Nagar (Kanasar) & Vill.- Rawra Tehsil:Phalodi Distrcit:Jodhpur** , Rajasthan under the provisions of the said Act(s). This consent is granted on the basis of examination of the information furnished by you in consent application(s) and the documents submitted therewith, subject to the following conditions:-

1 That this Consent to Establish is valid for a period from **02/07/2012** to **30/06/2015** or date **of Commencement of production / commissionning** of the **project or activities whichever is earlier .**

2 That this Consent is granted for **manufacturing / producing** following products / by products or carrying out the following activities or **operation/**processes or providing following services with capacities given below.

Particular	Type	Quantity / Capacity
SOLAR PV POWER PLANT	Activity	50.00 MW

3 That in case of any increase in capacity or addition / modification / alteration or change in product mix or process or raw material or fuel the project proponent is required to obtain fresh consent to establish.

4 That the control equipment as proposed by the applicant shall be installed before trial operation is started for which prior consent to operate under the provision of the **Water** Act shall be obtained. This consent to establish shall not be treated as consent to operate.

5 That the quantity of effluent generation and disposal along with mode of disposal for the treated effluent shall be as under:

Regional Office Jodhpur
Rajasthan State Pollution Control Board
SPL-I, Phase-I, Basni Ind. Area, Jodhpur
Phone: 0291-2723225
www.rpcb.nic.in
Registered

File No : F(Tech)/Jodhpur(Phalodi)/109(1)/2012-2013/999-1001
Order No : 2012-2013/Jodhpur/731 Dispatch Date: 24/08/2012

14 That the office memorandum issued by MOEF vide letter no J-11013/41/2006-IA.II(I) dtd 30.6.11 should be followed in letter and spirit as its applicability in relation to all projects falling under 8(b) of the EIA notification dtd 14.9.06 is justified in terms of the total land area acquired by any kind of project falling under wet land; agricultural land ; ecologically sensitive areas and also the loss of biodiversity, vegetation, displacement of habitation etc in reference to the same.

15 That the unit shall conduct Environment Studies through a recognized firm with particular reference to the flora, fauna and endangered species and the impact of the project on the biodiversity and ecological balance of the area and prepare an Environment Management Plan(EMP) accordingly also including relief and rehabilitation of displaced persons and corporate social responsibility and submit the same to the State Board within a period of two months and till then no work for the installation/ construction of solar plant shall commission at site to facilitate the conduction of Environment Impact Assessment studies.

16 That the EMP of the unit shall essentially include proposal for development of an area in the vicinity as Bio-diversity Park and plant trees and herbs of local species variety which are displaced by the project and conduct plantation in 33% of the total area of the project including biodiversity park.

17 That the unit shall prepare an inventory of the biodiversity disturbed by the project and planted alongwith the year of plantation and numbering of the same in the Biodiversity Park as mentioned above.

18 That tree and shrubs located at the project site should not be destroyed but shifted to the Biodiversity Park as far as possible.

19 That the natural drainage courses should be maintained and the construction work should not disturb the natural drainage courses.

20 That the E-Waste (Management & Handling) Rules 2011 dtd 12.5.11 shall be followed strictly.

21 That the units shall obtain consent to establish under Water Act 1974 for the residential colonies of the projects and also install sewage/effluent treatment plants for the domestic/industrial wastewater generated from the unit and the residential colonies if any and the treated wastewater shall be utilized for plantation purposes and zero discharge shall be maintained outside the premises.

22 That the project shall not be operated till the above conditions are met and verified by the Rajasthan State Pollution Control Board officials and consent to operate is granted to the above project.

23 That rain water harvesting system shall be provided to harness rain water for domestic purposes.

24 That the unit shall not dig tubewell / borewell within premises without obtaining permission from CGWA.

Regional Office Jodhpur
Rajasthan State Pollution Control Board
SPL-I, Phase-I, Basni Ind. Area, Jodhpur
Phone: 0291-2723225
www.rpcb.nic.in
Registered

File No : F(Tech)/Jodhpur(Phalodi)/109(1)/2012-2013/999-1001
Order No : 2012-2013/Jodhpur/731 Dispatch Date: 24/08/2012

Regional Officer

Regional Office Jodhpur
Rajasthan State Pollution Control Board
SPL-I, Phase-I, Basni Ind. Area, Jodhpur
Phone: 0291-2723225
www.rpcb.nic.in
Registered

File No : F(Tech)/Jodhpur(Phalodi)/109(1)/2012-2013/2267-2269
Order No : 2012-2013/Jodhpur/965 Date: 04/01/2013

M/s Welspun Solar AP Pvt. Ltd,

7th Floor, Kamla City, Senapati Bapat Marg, , Lower Parel (W), MUMBAI

Sub: **Consent to Operate** under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974,

Ref: Your application for Consent to Operate dated 17/10/2012 and subsequent correspondence.

Sir,

Consent to Operate under the provisions of section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 (hereinafter to be referred as the Water Act) as amended to date and rules & the orders issued thereunder is hereby granted for your **Solar Power (PV) plant** situated at **Khasra No. - 1627 & Khasra No. - 17, Vill.- Srimandrup Nagar (Kanasar) & Vill.- Rawra Tehsil:Phalodi District:Jodhpur**, Rajasthan, subject to the following conditions:-

1 That this Consent to Operate is valid for a period from **18/10/2012 to 30/09/2013** .

2 That this Consent is granted for manufacturing / producing following products / by products or carrying out the following activities or operation/processes or providing following services with capacities given below.

Particular	Type	Quantity with Unit
SOLAR PV POWER PLANT	Activity	50.00 MW

3 That this consent to operate is for existing plant, process & capacity and separate consent to establish/operate is required to be taken for any addition / modification / alteration in process or change in capacity or change in fuel.

4 That the quantity of effluent generation along with mode of disposal for the treated effluent shall be as under:

Regional Office Jodhpur
Rajasthan State Pollution Control Board
SPL-I, Phase-I, Basni Ind. Area, Jodhpur
Phone: 0291-2723225
www.rpcb.nic.in
Registered

File No : P(Tech)/Jodhpur(Phalodi)/109(1)/2012-2013/2267-2269
Order No : 2012-2013/Jodhpur/965 Date: 04/01/2013

Type of effluent	Max. effluent generation (KLD)	Recycled Qty of Effluent (KLD)	Disposed Qty of effluent (KLD)and mode of disposal
Domestic Sewage	1.600	NIL	1.600 Septic Tank and Soakpit
Vessel/Equipment Washing	38.000	NIL	38.000 Plantation, Horticulture

5 That the unit shall comply the provisions of Rajasthan Gazette Extraordinary Notification dated 24-06-2010 issued by Deptt. of Environment & shall apply renewal for consent to operate four months before expiry of this consent to operate to avoid payment of additional fees.

6 That the total project cost shall not exceed to Rs. 472.67 Crore which includes the cost of Land, Building and Plant & Machinery.

7 That the solar power shall be generated through photovoltaic cells only.

8 That the unit shall fulfills all the directions issued in Land Allotment letter issued by Distt. Collector Jaisalmer vide letter no. 3936-44 dtd. 10/06/2012 (amended ltr. no. 5478 dtd. 09/08/2012) for allotment of 695.0 Bigha land and letter no. 4594 dtd. 17/07/2012 (amended ltr no. 5558 dtd. 16/08/2012) for allotment of 385.0 Bigha
land for the project.

9 All the conditions and instructions as provided in the General conditions for Consent to operate under Water (Prevention & Control of Pollution)Act -1974 shall be complied with strictly.

10 That the industry shall not install any source of air pollution without obtaining prior Consent to Establish & Consent to Operate from the Board under the provision of Air (Prevention of Control of Pollution) Act'81.

11 The industry shall submit cess returns in case the water consumption is more then 10 KLD under the provision of Water (Prevention & Control of Pollution) Cess Act -1977 and as amended from time to time.

12 That the Industry shall ensure that noise from the unit does not exceed the prescribed noise standards for Industrial area i.e. 75 dB (A) Leq during day time and 70 dB (A) Leq during night time to meet the prescribed ambient noise standards. Day time is reckoned between 6 a.m. to 9 p.m. and night time is reckoned between 9 p.m. to 6 a.m.

Regional Office Jodhpur
Rajasthan State Pollution Control Board
SPL-I, Phase-I, Basni Ind. Area, Jodhpur
Phone: 0291-2723225
www.rpcb.nic.in
Registered

File No : F(Tech)/Jodhpur(Phalodi)/109(1)/2012-2013/2267-2269
Order No: 2012-2013/Jodhpur/965 Date: 04/01/2013

13 That the unit shall comply the recommendation of the Environmental Study Report (prepared by – M/s SENAS Consultants & M/s Kaustubh National Labs) and submit compliance report quarterly along with the progress of plantation carried out.

14 That tree and shrubs located at the project site should not be destroyed but shifted to the Biodiversity Park as far as possible.

15 That the natural drainage courses should be maintained and the construction work should not disturb the natural drainage courses.

16 That the E-Waste (Management & Handling) Rules 2011 dtd 12.5.11 shall be followed strictly

17 That the units shall obtain consent to establish under Water Act 1974 for the residential colonies of the projects and also install sewage/effluent treatment plants for the domestic/industrial wastewater generated from the unit and the residential colonies if any and the treated wastewater shall be utilized for plantation
purposes and zero discharge shall be maintained outside the premises.

18 That the project shall not be operated till the above conditions are met and verified by the Rajasthan State Pollution Control Board officials and consent to operate is granted to the above project.

19 That rain water harvesting system shall be provided to harness rain water for domestic purposes.

20 That the unit shall not dig tubewell / borewell within premises without obtaining permission from CGWA.

21 That in case of non-compliance of the above condition, this consent to establish shall become null & void.

22 That the industry shall submit compliance report of all the above stated conditions once to this office, quarterly.

23 That the consent is valid subject to fulfillment of all the other statutory requirements in other Laws/Acts/Rules of MoEF, DOE & Raj. State Pollution Control Board as applicable.

24 That the clearance from Forest Department for diversion of forest land under the FC Act shall be obtained.

25 That, not withstanding anything provided hereinabove, the State Board shall have power and reserves its right, as contained under section 27(2) of the Water Act to review anyone or all the conditions imposed here in above and to make such variation as it deemed fit for the purpose of Water Act.

26 That the grant of this Consent to Operate is issued from the environmental angle only, and does not absolve the project proponent from the other statutory obligations prescribed under any other law or any other instrument in force. The sole and complete responsibility to comply with the conditions laid down in all other laws for the time-being in force, rests with the industry/ unit/ project proponent.

Regional Office Jodhpur
Rajasthan State Pollution Control Board
SPL-I, Phase-I, Basni Ind. Area, Jodhpur
Phone: 0291-2723225
www.rpcb.nic.in
Registered

File No : F(Tech)/Jodhpur[Phalodi]/109(1)/2012-2013/2267-2269
Order No : 2012-2013/Jodhpur/965 Date: 04/01/2013

27 That the grant of this **Consent to Operate** shall not, in any way, adversely affect or jeopardize the legal proceeding, if any, instituted in the past or that could be instituted against you by the State Board for violation of the provisions of the Act or the Rules made thereunder.

This Consent to **Operate** shall also be subject, besides the aforesaid specific conditions, to the general conditions given in the enclosed Annexure. The project proponent will comply with the provisions of the **Water Act** and to such other conditions as may, from time to time , be specified, by the State Board under the provisions of the aforesaid Act(s). Please note that, non compliance of any of the above stated conditions would tantamount to revocation of **Consent to Operate** and project proponent / occupier shall be liable for legal action under the relevant provisions of the said Act(s).

Yours Sincerely

Regional Officer

Copy To:-
1 Member Secretary/Registry Cell, RSPCB, Jaipur.
2 Master File.

Regional Officer

Annexure 5

Land allotment letter

RAJASTHAN RENEWABLE ENERGY CORPORATION LIMITED
(Government of Rajasthan Undertaking)
E-166, Yudhisthir Marg, C-Scheme, Jaipur
Tel: 2225859 / 2228198 / 2221650 Fax: 0141-2226028

No. F12 (860) RREC/ Solar/ Azure Green Tech /2012-2013/D- 167 Dated: 11/04/2014

The District Collector,
Jodhpur

Sub: **Land allotment to M/s Azure Green Tech Pvt. Ltd. for setting up of 40 MW Grid Interactive Solar PV Power Project at Village-Hardhani Tehsil-Baori, District-Jodhpur under Rajasthan Solar Energy Policy 2011 (Reg. No. S/836/2011)**

Dear Sir,

In reference to the subject, it is to intimate that one project of 40 MW capacity of M/s Azure Green Tech Pvt. Ltd. has been selected under Batch-I of Phase-II of National Solar Mission. Firm has identified land for setting up 40 MW Grid interactive Solar Photovoltaic Project at Village-Hardhani Tehsil-Baori, District-Jodhpur under Rajasthan Solar Energy Policy 2011.

Firm's proposal for setting up 40 MW Solar Photovoltaic Power Project is found acceptable and it is requested that recommendation for allotment of land mentioned below on 10% DLC rate may be sent to the Revenue Department, Govt. of Rajasthan after examining it's suitability for allotment under Rajasthan Land Revenue (Allotment of land for setting up of Power Plant based on Renewable Energy Sources) Rules, 2007 under intimation to this office:

Village-Hardhani Tehsil-Baori, District-Jodhpur.

Sr. No.	Khasra No.	Total Area in Khasra (Bigha)	Total Area required (Hect.)
1	566	1360-10	35
2	568	746-01	65

Total Khasra 2 Nos. : 566 & 568
Total required area 100.00 Hect.
Copy of zamabandi and map of land is also enclosed herewith.

It is also informed that as per the PPA signed on 28.03.2014 by M/s Azure Green Tech Pvt. Ltd with Solar Energy Corporation of India (SECI), they are required to complete the project within 13 months from date of signing of PPA. As such to achieve the timeline it is requested that allotment of land may be done at the earliest.

Encl: As above.

Yours faithfully,
11/4/14
B.K Makhija)
Director (Technical)

Copy submitted / forwarded to the following for information & n/a:-

1. P.S. to Pr. Secretary, Revenue, Govt. of Rajasthan, Jaipur.
2. M/s Azure Green Tech Pvt. Ltd.8, Ground Floor, LSC, Pushp Vihar Madan Gir New Delhi-110062 Fax. No. 49409807. Please note that you have also to provide the right of way without any compensation.
3. Project Officer, RREC, Jodhpur.

Director (Technical)

7

RREC\Azure Green Tech Pvt. Ltd. \Letter.doc

Annexure 6

The LOI issued by SECI to developer for signing of the PPA

SOLAR

सौलर एनर्जी कॉर्पोरेशन ऑफ इंडिया
(भारत सरकार का उद्यम)
Solar Energy Corporation of India
(A Government of India Enterprise)

Ref. No. SECI/JNNSM/P 2/B-1/LOI/45APIPL/P3/2014 /171-6

Date: 26/02/2014

To

Azure Power India Pvt. Ltd.

No.8, Local Shopping Complex, Madangir, Pushp Vihar, New Delhi - 110062

Ph 01149409800

Kind Attn: Sh./Smt. Girish Narang, Vice President-Project Development

Letter of Intent

Sub: Selection of Solar PV Projects under Jawaharlal Nehru National Solar Mission (JNNSM) Phase II Batch-I: Letter of Intent for Project No. 3 of 40 MW at Village - Bhadla, Tehsil - Phalodi, District - Jodhpur, Rajasthan

Ref: This has reference to the following

A. The "Final Guidelines for Implementation of Scheme for setting up of 750 MW of Grid Connected Solar PV Power Projects under Batch I of Phase II of JNNSM with Viability Gap Funding support from NCEF vide No. 29/5(1)/2012-13/JNNSM dated 25th October 2013" including its amendments and clarifications issued by the Ministry of New and Renewable Energy (MNRE) (hereinafter referred to as "Guidelines").

B. The Request for Selection document RfS No. SECI/ JNNSM/ SPV/ P-2/ B-1/ RfS / 102013 Dated 28th October 2013 including Draft Power Purchase Agreement (i.e. PPA) and Viability Gap Funding (VGF) Securitization Agreement (including schedules and annexures) and subsequent clarifications/amendments/ revisions / notifications issued and uploaded during the process of RfS on SECI website www.seci.gov.in (hereinafter referred to as "RfS")

C. Log of events/notifications related to JNNSM Phase II Batch I as notified on various dates and available on SECI website www.seci.gov.in.

D. Your response to the RfS document submitted vide Bid Acknowledgement Receipt Sl. No. 49 for Grid Connected Solar PV Power Projects under JNNSM Phase II Batch I.

E. Your Bank Guarantee(s) towards Earnest Money Deposit (EMD) submitted along with RfS.

F. Your Financial Proposal submitted along with the response to the RfS seeking VGF for Solar PV Project and opened on 21st February 2014.

Dear Sir,

1.0 In reference to above and subject to various provisions of RfS, SECI is pleased to accept your offer to RfS for the project with the details given below:

Page 1 of 4

Allotted Project ID	Category & Capacity (MW)	Project Location	Maximum VGF Eligibility (INR) (In figures)	Maximum VGF Eligibility (INR) (In words)	Type of Depreciation proposed (Normal/AD)	Applicable Tariff (INR / kWh)
45APIPL-A-4N-SRJ	PART-A 40MW	Village - Bhadla, Tehsil - Phalodi, District - Jodhpur Rajasthan	880,000,000	Rupees Eighty Eight Crores Only	Normal	5.45

1.1 SECI confirms its intent to purchase the power from the proposed Grid Connected Solar PV Power Project under the JNNSM Phase II Batch I subject to the following terms and conditions as stated in various documents referred in Para 1.0 above and briefly brought out hereinafter.

1.2 The applicable tariff as mentioned above for power generated from the proposed Solar Power Project for the term of Power Purchase Agreement (PPA) to be entered into between your Company and SECI, for each project shall be firm for entire term of the PPA.

However, if at any stage it is observed with respect to the claim of depreciation in the Income Tax returns filed for the Project Company, that the Company is claiming Accelerated rate of Depreciation as per Income Tax Act 1961, the applicable Tariff of the said Solar Power Project shall be reduced to INR 4.75/kWh from the date of commissioning of the first unit of the Project.

1.3 Acceptance of the above project is subject to the Guidelines including amendments / clarifications issued by MNRE (Government of India) and terms and conditions of the RfS document including its clarifications/ amendments / elaborations / notifications issued by SECI.

1.4 The Project Company is required to submit the following documents along with the originals for verification on all working days within office hours on or before 28 Mar 2014:

1) A copy of the certificate of incorporation of the Project Company.

2) The details of promoters and their shareholding in the Project Company developing the project, duly certified by the Company Secretary/Director in original as at 20th March 2014. However, in case the project is being developed by a listed company, this condition will not be applicable.

3) Copy of the Memorandum of Association (MoA) highlighting the object clause related to generation of energy / power.

4) STU clearance in the name of Project Company.

5) Audited/Compiled Balance Sheet (along with all its Schedules, including Cash Flows) of the Project Company as at 20th March 2014, indicating minimum availability of Rs. 0.30 Cr./MW/Project (i.e. 20% of Rs. 1.50 Cr./MW/Project) in cash/cash equivalents (in the form of equity) on or before signing of PPA, duly certified by qualified Chartered Accountant/Management of the Project Company.

26/02/14

Another Rs. 1.20 Cr./MW/Project is required to be made available on or before the date of Financial Closure. To demonstrate this, necessary bank statements have to be furnished by the Project Company.

6) The Project Company shall furnish Performance Bank Guarantee strictly as per the Format 6.3.B of the RfS, from the SECI approved banks, to SECI in line with the provisions of Clause 3.10 of RfS document for each Solar PV Project before signing of PPA.

The total value of the Performance Bank Guarantee (PBG) shall be split into two Performance Bank Guarantees as per clause 3.10 (ii) of the RfS document. These Bank Guarantees shall be valid for a period of 16 months from the effective date of PPA. Further the PPA shall be signed only upon receipt of the total Performance Bank Guarantees of requisite value.

7) The EMD submitted shall be released only after receipt and verification of total Performance Bank Guarantees.

Note: SECI shall have the right to verify original documents of the Project Company for which copies have been submitted from the date of submission of response to RfS till date, if required.

1.5 Power Purchase Agreement (PPA) and VGF Securitization Agreement (as per the format given along with RfS) has to be signed on or before 28 Mar 2014. Effective date of PPA and VGF Securitization Agreement will be thirty (30) days from the date of issue of LoI irrespective of the date of signing of PPA and VGF Securitization Agreement within the given thirty (30) days period.

1.6 Disbursement of VGF amount shall be subject to entering into the VGF Securitization Agreement.

1.7 The Project Company shall report financial closure within 210 days from the effective date of Power Purchase Agreement and VGF Securitization Agreement. Accordingly, the Project Company shall furnish the following details within 210 days of the signing of PPA.

A. Reporting tie-up of financing arrangements for the Project.

B. Provide evidence that all requisite technical criteria as per Clause 3.13 of RfS have been fulfilled.

C. Submit power evacuation/transmission agreement with STU/CTU of the Project Company.

D. That the technology proposed to be used is commercially established technology and at least one Project based on this technology is successfully operational for at least one year.

E. Details of the Project with location and the successful operational period of the Project utilizing this technology.

F. Evidence of clear possession of the required land for the Project along with following documentary evidence:

Ramesh 26/02/14

a) Ownership or lease hold rights (for at least 30 years) establishing clear title of the land in the name of the Project Company along with possession of 100% of the area of land required for the project. Land on lease can be taken only from the State/Central Government Agency.

b) Certificate by the concerned and competent revenue/registration authority for the acquisition/ownership/vesting of the land in the name of the Project Company.

c) Sworn affidavit from the authorized person of the Developer listing the details of the land and certifying total land required for the project under clear possession of the Project Company.

d) A certified English translation from an approved translator in case above land documents are in other than English and Hindi Languages.

G. *The Project Developer would also need to specify their plan for meeting the requirement for domestic content (applicable only in case of Part A project.)*

1.8 The Project Company shall achieve commissioning of the Project within 13 months from the date of signing of PPA as per the conditions stipulated in Clause 3.14 of the RfS.

2.0 You are requested to make it convenient for signing of Power Purchase Agreement (PPA) and VGF Securitization Agreement on or before 28 Mar 2014 failing which provisions as per clause 3.10 of the RfS shall be applicable.

3.0 All disputes arising out of and/ or in connection with the selection of Solar PV Power Projects under the JNNSM Phase II Batch I and execution of PPA and VGF Securitization Agreement thereto shall be governed by laws of India and shall be subject to the jurisdiction of Courts of Delhi.

This LoI is issued in duplicate and you are kindly requested to acknowledge receipt of this letter by sending the stamped and signed duplicate copy of LoI to SECI.

Thanking you.

Yours faithfully,

Ramesh 26/02/2014

(Remesh Kumar K.)
General Manager
For and on behalf of
Solar Energy Corporation of India

Annexure 7

Photographs of subproject site

Site View 1

Site View 2

Photographs Showing Different Views of the Proposed Project Site for 40 MW Capacity Solar Power (PV Technology) Project Proposed by M/s Azure Green Tech Private Limited near Nandiya kalan and Hardhani Village Jodhpur District , Rajasthan under funding assistance of IREDA

Annexure 8

SEIA Report of subproject

Social and Environmental Impact Assessment Report
March, 2014

Proposed 40 MW Solar Photovoltaic Power Plant at Hardhani, Baori Tehsil, Jodhpur District, Rajasthan, India

Prepared By:
SHES Department AZURE

Prepared For:
Azure Green Tech Pvt. Ltd

DOCUMENT CONTROL

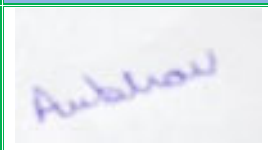
TASK	TITLE	SIGNATURE	DATE
Prepared by	Anubhav Ranjan (Asst. Manager – SHES & Quality)		31-03-14

TABLE OF CONTENTS

PROJECT AT A GLANCE

S.NO	Particulars	Details
1	**Location**	
	Village	Hardhani
	Tehsil	Baori
	District	Jodhpur
	State	Rajasthan
2	Latitude	26°46'01.2"N
3	Longitude	73°12'17.1"E
	Project Details	
4	Type of Project	Solar Polysrytalline PV Technology
5	Cost of the project	339.8Cr
6	Cost for Environment Management	35 lacs approx.
7	Total Area	250 Acres
	Climatology(Summer season: March to May 2011)	
8	A. Average Temperature	26.21°C
	B. Relative Humidity At 8:30 hrs At 17:30 hrs	 32% to 55% 26% to 35%
9	Dominant wind direction	SW
	Project Site Vicinity Details	
10	Nearest Railway Station	Jodhpur at a distance of 65 KM.
11	Nearest State Highway	SH-68 (40Km)
12	Nearest National Highway	NH-65, NH-112, NH-114
13	Nearest Road Net work	Distance of 12.3 km connects to NH-65
14	Nearest Airport	Jodhpur (70km)
15	Nearest Town/City	Osian
16	Nearest Water body	Luni River is at 110Km from site.
17	Nearest Hospital	Osian, Jodhpur
18	Nearest Police Station	Osian
19	Nearest Fire Brigade Station	Jodhpur (65Km)
20	Ecological sensitive Areas	No National Park, Biosphere Reserve.
21	Seismic Zone	Zone – II [as per IS 1893 (Part-I): 2002]

BENEFITS DUE TO PROPOSED PROJECT

The proposed Project brings in multifold advantages. Not only does it produce clean, pollution free energy, it also has the capacity to provide direct or indirect employment to the people living in and around that area.

It has the capacity of turning Rajasthan which is a harsh, barren land into a clean energy producing hub which will be emulated by the other states of India.

OBJECTIVE OF THE ESIA STUDY

The objective of Environmental and Social Impact Assessment (ESIA) is to prepare a document based on anticipated Environmental Impact due to setting up of 40 MW Photovoltaic based Solar Power Project and to applicable local and national regulations.

The proposal is for Solar PV based solar power project and there are no potentially significant adverse and irreversible social and environmental impacts. Therefore, according to the findings of the environmental and social impact assessment study conducted with respect to the establishment of the Project and a review of the broad Equator Principles criteria and requirements for the classification of Category 'A', 'B' & 'C' projects has indicated that the Hardhani Solar Power Project is more closely aligned **to 'Category B'** project due to limited adverse social or environmental impacts and these are limited to site-specific, largely reversible and readily addressable through mitigation measures.

LEGAL POLICIES & INSTITUTIONAL FRAMEWORK

The Solar Photovoltaic Power Projects are not covered under the ambit of EIA Notification, 2006 and hence, no environmental clearance is required and it does not require preparation of Environmental Impact Assessment Report and pursuing Environmental Clearance from Central Government or State Level Environmental Impact Assessment Authority. Further, Rajasthan State

Pollution Control Board has included Solar PV Projects under "Green category" for consent to establish/operate mechanism.

The environmental regulations, legislations and policy guidelines and control for the proposed project are governed by various Government agencies. The principal environmental regulatory agency in India is Ministry of Environment and Forest (MoEF), Delhi. The important legislations governing the proposed Project are given below:

The key environmental legislations pertaining to the proposed operations include:

- The Water (Prevention and Control of Pollution) Act, 1974;
- The Air (Prevention and Control of Pollution) Act, 1981;
- The Environment Protection Act, 1986, Rules there under (with amendments);
- Land Acquisition Act

Besides this, the project shall meet the National Ambient Air Quality Standards (NAAQS), Ambient Noise Standards and Effluent Discharge Standards set by CPCB.

PROJECT DESCRIPTION

Land:

The total requirement of land for the proposed 40 MW project is 250 acres, which is allotted by the Govt. of Rajasthan on lease for the purpose of developing Solar Power Projects. The proposed allocation of the land is as per the Azure's Social, Environmental, Health and Safety Guidelines. No Relocation of the human habitants is required as the land is barren and non-agricultural.

Water:

Water will be required the construction phase for construction and human work related activities. Water may also be used during operation phase of plant but we prefer dry cleaning. Water requirement shall be fulfilled by public water tankers/public distribution system and for operation (if required) will be from the above said sources.

WASTE WATER TREATMENT AND DISPOSAL SYSTEM

Azure has planned to use the wiping method for cleaning Solar PV modules instead of sprinkle system. This will not only substantially reduce the water requirement of the Project, but also the water discharge from the project. Since the water is used for Solar PV module cleaning purpose, Water runoff / discharge from the panels is likely to be absorbed into the arid ground below the panels, and no drainage canal is required. The discharge water does not include any chemical or hazardous material and hence no treatment is required.

POWER EVACUATION

The power generated from the proposed solar power plant shall be evacuated through 132/220 KV transmission line to 132/220 KV Bhawad Sub-Station of RVPNL. The power generated from the proposed solar PV power plant at LT level shall be stepped up first to 11 kV level through suitably rated transformers & then to 132 kV level through 11/132 kV step-up transformers. The power from the Solar PV project shall be evacuated through proposed 132/220 kV transmission line to Bhawad substation.

BASELINE ENVIRONMENT

This Solar PV project is proposed at Hardhani village in Baori Tehsil of Jodhpur District, which is in western part of Rajasthan and it falls under 'Hot and Dry' Climatic Zone of the country. An area within 2 km around the project can be considered as influence zone and hence it can be taken as study area to understand the vicinity of the proposed project. However, as the environmental setting is arrived based on secondary data, all available data has been used for the purpose of Environmental understanding. There are no water bodies or perennial river near project area. No forest area is near project site. The sparse distribution of xerophytic vegetation is observed near the study area. There is no any wildlife sanctuary within 10 km of project area.

ENVIRONMENTAL & SOCIAL IMPACT & MANAGEMENT PLAN

The ESMP has been designed to adhere to the requirements laid out under the Indian Legislation, IFC Performance Standard and Azure Power's SHES-Management System plans and procedures. The ESMP takes cares of environment and socio-economic aspects under the vicinity of the project and covers Azure Power activities for construction and operations.

The transmission lines for the proposed project are also covered. The mitigation measures to be adopted for the implementation of the proposed project include the following Environmental Management Plan;

- Occupational Health and Safety;
- Labour Working Conditions;
- Construction Labour Management;
- Environmental Action and Monitoring Plan;
- Public Consultation and Information Disclosure Plan;
- Grievance Redressal Mechanism;

CHAPTER 1. INTRODUCTION

Azure Power India Pvt. Ltd has been a leader in the Indian Solar Power Industry since its inception. The company operates with a singular mission to reduce the cost of power for its customers. In order to achieve its mission, the company benchmarks itself against every source of power available to mankind today. The ambition of the company is to achieve this mission not only for India but for the entire world. This shall enable the company to lead this industry by setting new standards & guiding other power producers to follow the same. Azure has set up first utility scale solar power plant in the country of capacity 2 MW in Punjab. The facility is operational, exceeds world-class power generation standards, and provides electricity to 32 villages and 20,000 people in the Amritsar District of Punjab.

One of the SPV promoted by Azure Power India Pvt. Ltd vis Azure Green Tech Private Ltd is developing a utility scale grid connected 40 MW solar photovoltaic power plant in Rajasthan. The plant is proposed at **Hardhani village** in Baori Tehsils of Jodhpur District in the State of Rajasthan. The company has signed a Power Purchase Agreement (PPA) with the Government of Rajasthan for 25 years. Rajasthan, the largest state in India receives maximum solar radiation intensity in India. According to US Department of Energy, Rajasthan receives the second largest amount of solar radiation in the world and is best suited for solar power generation since average rain fall is minimum. Rajasthan has more than 300 sunny days in a year with solar radiation of about 5.65Kwh/sq-m/day. Mostly the western part of Rajasthan is blessed with abundant solar energy. Jodhpur in Rajasthan is receiving maximum solar radiation which is known as Sun City of India and is also blessed with abundant land, so it would be ideal for solar PV without any social and ecological impact.

1.1 PROJECT STATUS

The status of permits/approval/consent as required for the Azure solar power project under relevant provision of applicable national regulations have been outlined below:

S.NO	Permit &Approval	Status	Completion Date
1	Power Purchase Agreement	Obtained	28th Mar'14
2	Approval from RVPNL(Rajasthan Vidhyut Prasaran Nigam Limited) for evacuation permission	Approval has been taken for tentative land. The same will be renewed once land is finalized.	
3	Consent to establish from RSPCB	Will be Obtained from Rajasthan state Pollution Control Board.	
4	Principal Employer Registration	Will be Obtained from Concerned State Authority.	
5	Contractor License	Azure Contractors for the work execution will be taken. The process of obtaining the relevant permit/License from relevant authorities and the status of the same will be periodically communicated to the investors.	
6	Certification of Standing Order	Will be Obtained from the authority. This will be communicated to the investors.	

1.2 KEY FEATURES OF SITE

Following are key features of proposed 40 MW Solar PV Project:

- The location falls under the 'Hot and Dry' climatic zone of India and comprises extreme weather conditions of hot desert.
- The project location comprises well accessibility as the motor able asphalt road is 1 km away from the site.
- NH-65 is located on 13 km from selected project location;
- Nearest Airport is Jodhpur which is about 70 km from the projected location.
- Nearest City to the site is Jodhpur which is about 65 km.
- Jodhpur is the nearest railway station from the location.
- Soil condition at site is hard sandy and surface is almost flat; hence limited land work is needed to make land flat as per the requirements of solar PV power plant.
- Bhawad (132/220 kV) is the nearest grid substation for power evacuation

1.3 PROJECT JUSTIFICATION

Government of India has announced Jawaharlal Nehru National Solar Mission which envisages setting up of Solar Power Projects of 20,000 MW capacity by 2022. State Regulatory Commissions have specified a percentage of the total purchases to be made from non-conventional energy sources. The solar potential in India is unexplored so far is of the order of lakhs of MW keeping in view the solar insolation value in different parts of Rajasthan and availability of waste land.

Solar power also has the inherent quality that the power is produced when it is most needed and is efficiently despatchable form of Renewable energy. Rajasthan particularly, with vast availability of waste land and receiving highest solar insolation.

In view of above, the 40 MW Solar Power Project at **Hardhani Village** in Jodhpur District, Rajasthan is justified.

As the ever-increasing demand for energy continues to squeeze fossil fuel reserves, India is looking at fossil fuel-rich countries around the world. Consequently, India has emerged as a major importer of energy and this has seriously sensitized the Government of India to look for meeting the energy requirements by lowering the demand-supply gap and strategically developing energy security of the country.

Electricity consumption in India has more than doubled in the last decade, outpacing economic growth. Despite capacity additions, electricity demand continues to outstrip power generating capacity, compelling the Central Government to frame National Electricity Policy, 2005, enact Electricity Act, 2003 and spell Vision 2020. The said Act and the Vision 2020, while giving due importance to electricity generation through conventional sources, have recognized the need to increase power generation through non-conventional sources too. India too realized additional advantages of curbing worldwide pollution and formulated strategies to explore the potential of all renewable energy resources like hydro, wind and solar along with biomass.

RENEWABLE ENERGY –INDIA SCENARIO

The Government of India created independent ministry for energy; the MNRE in the early 1980s. According to the statistics of MNRE, by 31st January 2014, the cumulative renewable energy based power generation capacity is 31206.64 MW. Wind power (20298.83 MW) accounts for a major part of the renewable energy capacity in India.

Considering the localized potential for wind energy, solar energy is one of the best solutions to meet India's demand for low cost, on and off-grid solutions in the short to medium term.

A coherent and ambitious policy has been set at the national level while various incentive mechanisms were implemented at state levels. In most states across the country, the State Electricity Regulatory Commission had introduced a regulation for Renewable Purchase Obligation for distribution licensees and open access consumers.

Since Solar Power is at an introductory stage of its life cycle, Government initiatives are expected to drive it until 2022. One such initiative is the Jawaharlal Nehru National Solar mission which envisages in making India a global leader in solar energy with an installed solar power generation capacity of 20 GW by 2020, 100 GW by 2030 and 200 GW by 2050.

Rajasthan receives maximum solar radiation intensity in India with very low average rainfall and also has unutilized low cost desert land available in abundance. In line with the Central Government policy, Rajasthan has come up with a new Solar Policy, named as, Rajasthan Solar Policy 2011. This regulation has been complemented more recently by the Jawaharlal Nehru National Solar Mission (JNNSM).

As of January 2014 the total grid connected Solar PV power generation capacity was about 2208.36 MW according to MNRE. **Table 4-1** presents the recent achievement of renewable energy technologies in India by 31.01.2014.

TABLE 1-2: CUMULATIVE ACHIEVEMENT OF VARIOUS RENEWABL ENERGY SYSTEMS/ DEVICES IN INDIA AS ON 31.01.2014

Sector	Target		Achievements during the Month of January		Achievements during the Year (up to Jan-2013)		Cumulative Achievements	
	2012-13	2013-14	2012-13	2013-14	2012-13 (% of Target)	2013-14 (% of Target)	(as on 31.01.2013)	(as on 31.01.2014)
I. GRID-INTERACTIVE POWER (CAPACITIES IN MW)								
Wind Power	2500	2500	131.3	149.35	1199.00 **(48.00%)**	1245.88 **(49.83 %)**	18551.7	20298.83
Small Hydro Power	250	300	10.1	11	110.93 **(31.70 %)**	141.90 **(47.30 %)**	2506.24	3774.15
Biomass Power & Gasification	105	105	-	1	98.50 **(93.50 %)**	22 .00**(20.95 %)**	1248.6	1285.6
Bagasse Cogeneration	250	300	41.3	0	297.70 **(84.5 %)**	175.45 **(58.48 %)**	2280.93	2512.88
Waste to Power	20	20	-	0	6.40 **(32 %)**	3.00 **(15 %)**	96.08	99.08
Solar Power	800	1100	60.23	28.36	295.30 **(36.90 %)**	523.49 **(47.59 %)**	1236.48	2208.36
Total	**4125**	**4325**	**242.93**	**188.71**	**2005.83 (48.60 %)**	**2110.83 (48.80 %)**	**26920.03**	**30178.9**
II. OFF-GRID/ CAPTIVE POWER (CAPACITIES IN MW_{EQ})								
Waste to Energy	20	10	0.9	0	12.76 **(63.80 %)**	4.06 **(40.60 %)**	114.5	119.63
Biomass(non-bagasse) Cogeneration	60	80	12	7.56	55.53 **(92.60 %)**	46.19 **(57.73 %)**	438.04	517.34
Biomass Gasifiers	1.50	1	0.096	0.16	0.672 **(44.80 %)**	0.576 **(57.60 %)**	16.79	17.63
-Rural								
- Industrial	10	9	1.2	1.1	6.02 **(60.20 %)**	4.73 **(52.56 %)**	140.1	146.4
Aero-Genrators/Hybrid systems	0.5	1	0.11	0.03	0.21 **(42.00 %)**	0.07 **(7 %)**	1.85	2.18
SPV Systems	30	40	1.47	15.39	17.59 **(58.60 %)**	35.09 **(87.72 %)**	35.09	159.77
Water mills/micro hydel	2	2	(10 nos)		(70 nos)	1.66 **(83 %)**	(2131 nos)	10.18
	(500 nos)	(500 nos)				(416 nos)		(2547 nos)
Bio-gas based energy system	2	2	-	-	-	-	-	-
Total	**126**	**145**	**15.776**	**24.33**	**92.78 (73.60 %)**	**92.38 (63.71 %)**	**819.02**	**973.13**

Source: MNRE, India KW= Kilowatt: MW=Megawatt: Sqm: Square metre

As per Ministry of Power the total Installed capacity is 228721.73 MW as per present scenario. Share of renewable energy capacity during the twelfth plan is expected to be more than 10%. Solar power forms an integral component of India's renewable energy initiative due to abundant solar irradiance in the country. The Government of India has already announced JNNSM to promote solar power in the nation with ambitious targets.

Rajasthan State Solar Power Policy 2011*:* The Energy and Department of the Government of Rajasthan has formulated a Solar Power Policy in January 2011, to promote solar energy as an additional and alternative source of energy. The State is endowed with high solar radiation levels having 300 days of clear sun, with conducive and arid condition which requires minimal sun tracking, especially in the barren wasteland areas.

The objective of this Policy is to establish Rajasthan as a National leader in solar energy in phased manner by creating the policy frame work for promoting use of solar energy in various applications and move towards achieving following objectives:

- ✓ Developing a global hub of solar power of 10000-12000 MW capacity in next 10-12 years to meet energy requirements of Rajasthan and India.
- ✓ Contributing to long term energy security of Rajasthan as well as ecological security by reduction in carbon emissions.
- ✓ Providing a long term sustainable solution for meeting energy needs and considerably reducing dependence on depleting fossil fuel resources like coal, oil and gas.
- ✓ Productive use of abundant wastelands, thereby utilizing the non-industrialized desert area for creation of an industrial hub.
- ✓ Creating favorable conditions to solar manufacturing capabilities by providing fiscal incentives.
- ✓ Generating large direct and indirect employment opportunities in solar and allied Industries like glass, metals, heavy industrial equipments etc.
- ✓ Creation of skilled and semi-skilled man power resources through promotion of technical and other related training facilities.

- ✓ Creating an R&D hub for deployment of various combinations of solar power technologies and solar based hybrid co-generation technologies which will focus on improving efficiency in existing applications, reducing cost of balance of system.

- ✓ To achieve the grid parity in next 7-8 years, the State will encourage the Solar Power Developers to establish manufacturing plant of their technology in Rajasthan.

- ✓ Establishment of an industrial set-up involving both domestic and foreign manpower participation which will promote Rajasthan as a global tourist destination.

- ✓ Create a solar centre of excellence which would work towards applied research and commercialization of nascent technologies to accelerate the march to grid parity.

Rajasthan Energy Department (RED) will act as the Nodal Agency for facilitation and implementation of the Solar Power Policy. They will also assist the project developers to achieve the objectives of this Policy.

x. **State allotments to Azure:** The Energy Department of the Government of Rajasthan has allocated 250 acres to Azure 40 MW solar power capacity under the Solar Power Policy 2011.

1.4 OBJECTIVE OF THE ESIA STUDY

The objective of conducting an EIA is to meet the project's Social and environmental assessment requirements following Azure SHES management System and Plan and procedure. This scope of the EIA Study being incorporated in the present ESIA report has is to assess the significant Social and environmental impacts and suggestion of mitigation measures.

The document has been made to comply with the requirements of Azure SHES management System and plan & Procedure as well as applicable local and national regulations. To comply with other lender's requirements, the document also addresses IFC Performance Standards which will be met by the project.

In the context of the scope of the project, the ESIA report has addressed the following, where applicable:

- ❖ Category of the project consistent with Government of India
- ❖ Baseline Environmental and Social conditions;
- ❖ Relevant host country laws, regulations, applicable treaties and agreements;
- ❖ Protection of human health, cultural properties and biodiversity including endangered species and sensitive ecosystems;
- ❖ Major hazards; Occupational health and safety;
- ❖ Socio-economic impacts; Land use: Land acquisition; Involuntary resettlement;
- ❖ Impacts on indigenous peoples and communities; if applicable

- Cumulative impacts of existing, proposed and anticipated future projects;
- Efficient production, delivery and use of energy; and
- Pollution prevention and waste minimization, pollution controls (liquid effluent and air emissions) and solid and chemical waste management.

The EIA being addressed in the present ESIA Report comprises of baseline data on existing conditions on physical and biological environment, and social environment together with the anticipated environmental impacts and proposed mitigation measures. Observations were also being made along the proposed transmission line tower locations. Although, this is final route of transmission line, some minor changes are not ruled out till the time RoW is obtained. Detailed assessment of the baseline environment has been conducted for the distance up to 5 km.

The ESIA activities have been carried out by Azure SHES team.

All the issues such as acquisition of land, ecology, influx of people during construction and operation phase, shelter and sanitation, the equipment's and machineries, environmental health and safety, occupational hazard, social and environment management and monitoring plan have been dealt in detail in the respective sections of the ESIA Report.

Therefore while categorizing this Project; the most important aspects which may impact the project in a significant manner have been described in various chapters of the ESIA document. However these are briefly enumerated below to have a quick assessment of the situation.

TABLE 1-3: OVERALL ENVIRONMENTAL IMPACT FINDING

Environmental parameter	Level of impact	Reason	Mitigation measures
Air Impact	Low	No atmospheric Emissions from the process.	-Use of PV based solar power technology
Water	Low	-Plant will requires very low amount of water -No effluent is envisaged to be discharged from the plant that may have impact.	In the case of wet cleaning, the amount of water needed is insignificant. -There is no need of water if Azure manages to successfully implement dry cleaning of module -Azure shall arrange water tanker from nearby area -No effluent should be Discharged
Land	Low	Impact of change in land use	-Site selection has been made in consideration of Rajasthan Land Revenue (Allotment of land for setting up of power plant based on Renewable Energy Sources) Rules, 2007
Noise	Low	-No Sources of Noise within the Project area. -As no sensitive locations in the Vicinity of the project site.	-NA -Noise level of machines shall be below 85 dB (A)
Ecosystem	Low	-As no ecologically sensitive place lies within 10 km radius from the project site	-Although there is no significant vegetation cover within the study area, plantation activities will be carried out subject to viability.
Socio-Economic	Low	-Total land identified for the project is Government barren land -No land acquisition is anticipated for the transmission line tower footings. Right of way for the transmission line and partial loss of privately owned lands may affect/ limit future land use and may decrease its market value.	NA -Construction labours will be housed on temporary construction camps specially developed for this purpose with all basic amenities.

The assessment of the project has been considered for both positive and negative effects. Adoption of green power generation technology for power generation with no emissions and effluent discharge will have least impact on the ambient environment and on the host community.

The land of 250 acres of government land for the power plant site has no involuntary resettlement has no involuntary resettlement impacts or any compensation issues. Scarcity of water for agriculture and rocky barren land with low soil fertility and low productivity make this area unsuitable for agriculture wherein industrial activity can be considered as alternate livelihood option for the host community. Thus, generation of allied employment and Income Generation Activities will improve the quality of life of the host community.

1.5 METHODOLOGIES AND APPROACH OF ESIA

The Environmental and Social Impact Assessment has been conducted based on secondary data to include the following:

- Baseline information about the environmental, social, and economic conditions surrounding the project area; to determine the existing status and post project scenario in respect of these parameters;
- Identify potential impacts of the project and the characteristic, magnitude and distribution of the impacts;
- Formulate Environmental Management and Monitoring Action Plan

This ESIA report is undertaken to meet the environmental assessment requirements of Azure SHES management System and Plan &Procedure and the requirements of IFC Performance Standards.
Various environment and social parameters were identified and examined as per standard methods. The detailed data for different parameters are given in the baseline chapter. The parameters considered for the study and their source of information are given in **Table 1-4 below**

TABLE 1-4: ENVIRONMENTAL ATTRIBUTES AND PARAMETERS

S.NO	ATTRIBUTE	PARAMETERS	SOURCE OF INFORMATION
1	Meteorology	Wind speed and direction, Temperature, Relative humidity and Rainfall	Surface Meteorology and Solar Energy (SMSE), NASA, RetScreen, NREL
2	Ecology	Existing terrestrial and aquatic flora and fauna within 10-Km radius circle.	Secondary data was collected from the Government department.
3	Land Use	Trend of land use change for different categories	Based on Survey of India Topo-sheet and Satellite imagery
4	Socioeconomic aspects	Socio-economic features, labour force characteristics, boom town effects	Based on secondary sources data like primary census abstracts of census of India 2011.

CHAPTER 2: LEGAL POLICIES & INSTITUTIONAL FRAMEWORK

2.1 INTRODUCTION

The emerging environmental scenario calls for attention on conservation and judicious use of natural resources. There is a need to integrate the environmental consequences of the development activities and for planning suitable measures in order to ensure sustainable development of a region. The environmental considerations in any developmental process have become necessary for achieving sustainable development. To achieve such goals the basic principles to be adopted are:

- To enhance the quality of environment in and around the project area by adopting proper measures for conservation of natural resources;
- Prevention of adverse environmental and social impact to the maximum possible extent; and
- To mitigate the possible adverse environmental and socio-economic impact on the project-affected areas.

2.2 REGULATORY FRAMEWORK

This section provides a brief summary of India's relevant national environmental legislation. Ministry of Environment and Forests (MoEF) is the nodal agency for drafting the new environmental legislations and giving the Environmental Clearance (EC) to the Greenfield and Brownfield projects.

The process of Environmental Impact Assessment was made mandatory in 1994 under provisions of Environmental Protection Act, 1986. From time to time amendments have been made to the EIA Notifications. Under current EIA notification 14th Sept 2006 and its subsequent amendments, procedure has been laid down for projects or activities that require prior environmental clearance from the concerned regulatory authority.

The notification categorizes the projects as Category "A" and Category "B" based on the spatial extent of potential impacts and potential impacts on human health and natural and manmade resources. Application seeking prior environmental clearance in all cases is required to be made in the prescribed forms along with conceptual plan before commencing any construction activity or preparation of land at the site by applicant.

All projects or activities included as Category 'A' in the Schedule should require prior environmental clearance from the Central Government in the Ministry of Environment and Forests (MoEF); All projects or activities included as Category 'B' in the Schedule will require prior environmental clearance from the State/Union territory Environment Impact Assessment Authority (EIAA).

As per requirement of environment clearance under EIA Notification dated 14th September 2006 and subsequent amendment dated 1st December 2009. "Solar Projects" are not covered by the notification.

MoEF in its Office Memorandum No. J-11013/41/2006-IA.II (I) dated 13th May, 2011 stated that the Solar Photovoltaic Power Projects are not covered under the ambit of EIA Notification, 2006 and hence, no environmental clearance is required. Hence, the Solar Power PV Projects does not require preparation of Environmental Impact Assessment Report and pursuing Environmental Clearance from Central Government or State Level Environmental Impact Assessment Authority.

Rajasthan Pollution Control Board (RPCB) is responsible for implementing environmental legislation and issuing the Construction and Operating permits for Greenfield and Brownfield projects with certain conditions in view of Local regulations and environmental issues within Rajasthan where the project is located. However, Rajasthan State Pollution Control Board in its Office Order dated 19.2.2009 has identified grid interactive Solar Photovoltaic power plants under "other category" of industrial units. Further, RSPCB office in its office order dated 21.12.2010 does not include solar power projects in Red or Orange Category and hence are covered in "Green category" for consent to establish/operate mechanism. Hence, Consent to Establish for the proposed project should be obtained from Rajasthan State Pollution Control Board. Application for the same should be submitted by May 2014. The consent to establish and operate should also be obtained.

Apart from the above, other relevant national and local statutory regulations that are to be followed by proposed project are summarized below. Brief details of the same are given in subsequent sections.

DETAILED FRAMEWORK PROCESS OF IFC ENVIRONMENTAL ASSSESSMENT:

2.3 IFC SOCIAL AND ENVIRONMENTAL PERFORMANCE STANDARDS

The International Finance Corporation has laid down a set of eight Performance Standards that the project developers, who receive debt or equity funding from the agency, need to comply with. The first Performance Standard requires the project developer to conduct a Social and Environmental Assessment of a proposed project at an early stage of project planning to against the potential risks and impacts described in the Performance Standards. The provisions of the Performance Standards relevant to solar power projects are summarized below:

Performance Standard #1: Social & Environmental Assessment and Management Systems

Objectives:

- ***Identify and assess environmental and social impacts in the project's area of influence.***
- ***Avoid, minimize, mitigate or compensate for adverse impacts***
- ***Ensure that affected communities are engaged on issues that may affect them***
- ***Promote improved environmental and social performance through effective management systems***

Requirements & Compliance:

REQUIREMENT	COMPLIANCE
Conduct an Environmental and Social Impact Assessment (ESIA or EIA) of the project, appropriate to the nature of the project's environmental and social risks and potential impacts, to include issues identified in Performance Standards 2 to 5	An ESIA has been prepared by Azure taking into consideration the potential social and the environmental impacts and risks of the project
Establish Environmental and Social Management Plans commensurate with the findings of the ESIA and consultation with affected communities.	An Environmental and Social Management Plan has been prepared and incorporated in the ESIA report taking into consideration the Potential social and environmental impacts or risks already identified & Assessed in ESIA.
Establish Action Plans where specific mitigation measures and actions are required for the project to comply with applicable laws, regulations and the requirements of these Performance Standards	An ESAP has been prepared and incorporated in the ESIA report for implementation of mitigation measures in compliance with the statutory requirements and Performance Standards
Provide organizational capacity and contractor / employee training to enable project to achieve continuous environmental and social performance	Organizational structure with roles and responsibilities of the team within the organization is defined in ESIA
Establish and maintain a timely process of community engagement, including a grievance mechanism, focusing on disclosure of information and consultation with local communities affected by project risks or adverse impacts that is free from external manipulation, interference or coercion to ensure relevant and understandable access to project information	A community Engagement plan has been developed as integral part of ESIA which aims to inform the community project related adverse impacts or risks The grievance redresses mechanism has been developed in ESIA.
Establish procedures to monitor and measure the effectiveness of the environmental and social management program, including internal reporting of the program's effectiveness to the project's senior management, disclosure of Action Plans (including material changes to such Plans) to affected communities, and external reporting to affected communities on the results of Action Plans, commensurate with the concerns of the affected	System of monitoring with Periodic audits will be established

Performance Standard #2: Labour and Working Conditions

Objectives:

- ***Establish, maintain and improve the worker-management relationship***
- ***Promote fair treatment and equal opportunity for workers, in compliance with national laws***
- ***Protect workforce by addressing child labour and forced labour***
- ***Promote safe working conditions and protect / promote the health of workers***

Requirements & Compliance:

REQUIREMENT	COMPLIANCE
Establishment of a Human Resources Policy consistent with the requirements of this Standard that informs employees of their rights under national labour and employment laws	Azure has already framed the Corporate HR policies.
Document and communicate to all employees' conditions and terms of employment.	Will be Complied
Respect collective bargaining agreements with worker organizations and provide reasonable conditions and terms of employment that, at a minimum, comply with national law, and enable alternative means for worker expression of grievances where national law restricts worker organizations	Will be implemented during operation phase
Protect the workforce from forced labour and illegal or economically exploitative child labour	Azure will abide by the National legislations on child labour. The clauses are suitably incorporated in the Contractor's bidding terms
Provide workers with a safe and healthy work environment, taking into account risks inherent to the particular project sector	Will be complied

Performance Standard #4: Community Health & Safety

Objectives:

- ***Avoid or minimize the risks to, and impacts on, the health and safety of the local community over the project life cycle, from both routine and non-routine circumstances.***
- ***Ensure that the safeguarding of personnel and property is carried out in a legitimate manner that avoids or minimizes risks to the community's safety and security.***

Requirements & Compliance:

REQUIREMENT	COMPLIANCE
Evaluation of risks and impacts of the project on health & safety of the affected community during the project lifecycle and establish preventive/mitigation measures to reduce/minimize the impacts. Disclosure of action plans to affected community and the government agency.	The potential occupational hazards arising from the project activities and the impacts on health & safety of the affected community have been identified and assessed in Chapter 6 of ESIA.
Design, construct, operate and decommission of Structural elements or components in accordance with good industrial practice to reduce impact on community health & safety	An occupation health safety plan has been Formulated (Chapter 7) of this report.
Minimization of impacts on the health and safety of the community caused by natural hazards that could arise from the land use changes due to project activities.	A management plan has been formulated as part of ESIA process to address the issue.
Prevent or minimize the potentials for community exposure to communicable diseases during project activities.	CSR Plan and activities is in final stage and will be finalized soon.

Performance Standard #5: Land Acquisition and Involuntary Resettlement

Objectives:

- ***Avoid or minimize involuntary resettlement whenever feasible by exploring alternative project designs.***
- ***Mitigate adverse social and economic impacts by providing compensation for loss of assets at replacement cost and ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation and informed participation of those affected.***
- ***Improve or at least restore livelihoods and living standards of displaced persons.***
- ***Improve living conditions among displaced persons through provision of adequate housing with security of tenure at resettlement sites.***

Requirements & Compliance:

REQUIREMENT	COMPLIANCE
Avoidance or at least minimization of involuntary resettlement by exploring alternative project designs balancing environmental, social and economic costs and benefits; and by acquiring land through negotiated Settlements.	The land has been allocated by Rajasthan Government. It is barren and non-agricultural land.
Compensation and benefits for displaced person as per Performance Standard	**Not Applicable:** The entire land proposed for the project is revenue land. There are no settlements in the land proposed. The government land for setting up proposed project has will be allocated for the project. Hence, there are no Rehabilitation and Resettlement issues involved.
Disclosure of all relevant information and consultation with affected persons and communities in decision making process related to resettlement	NA
Establish a grievance mechanism to record and resolve communities' concerns and grievances about the relocation and compensation	NA
Resettlement planning and implementation of the displaced persons/communities.	NA

2.4 LEGISLATIVE FRAMEWORK

The environmental regulations, legislations and policy guidelines and control for the proposed project are governed by various Government agencies. The principal environmental regulatory agency in India is Ministry of Environment and Forest (MoEF), Delhi. The important legislations governing the proposed Project are given below:

The key environmental legislations pertaining to the proposed operations include:

- The Water (Prevention and Control of Pollution) Act, 1974;
- The Air (Prevention and Control of Pollution) Act, 1981;
- The Environment Protection Act, 1986, Rules there under (with amendments);
- Electricity Act 2003

2.5 THE WATER (PREVENTION AND CONTROL OF POLLUTION) ACT, 1974

This Act introduced the State Pollution Control Boards (SPCB) to grant Consent to Establishment (CTE) and Consent to Operation (CTO) to the industries. The establishment or operation of any industry cannot be undertaken without the prior consent of the SPCB. While granting the consent, SPCB can stipulate conditions pertaining to the effluents arising from the process. The consent to operate is granted for a specific period (usually one year) after which the conditions attached are reviewed by the SPCB before renewal.

2.6 THE AIR (PREVENTION AND CONTROL OF POLLUTION) ACT, 1981

This Act is very similar in scope to the Water Act, 1974. The Act stipulates the establishment of State Boards for the Prevention and Control of Air Pollution. In States where a water pollution board had already been established under the earlier Water Act, the two boards were combined to form SPCBs.

2.7 ENVIRONMENT PROTECTION (EPA) ACT AND RULES, 1986

EP Act was enacted to provide for the protection and improvement of environment and for matters connected there with. A decision was taken by India to protect and improve the human environment at the United Nations Conference on Human Environment held at Stockholm in June 1972. It is considered necessary to prevent the hazards to human beings, other living creatures, plants and property.

This Act is an umbrella Act and gave birth to many sub acts and rules. The EP Act call for procedural requirements for:

- Obtaining Environmental Clearance; and
- Submission of Environmental Statement.

This act was enacted with the objective of providing for the protection and improvement of the environment. It empowers the Central Government to establish authorities [under section 3(3)] charged with the mandate of preventing environmental pollution in all its forms and to tackle specific environmental problems that are peculiar to different parts of the country. Under this Act, the Central Government is empowered to take measures necessary to protect and improve the quality of the environment by setting standards for emissions and discharges; regulating the location of industries; management of hazardous wastes, and protection of public health and welfare. From time to time the Central Government issues notifications under the EPA for the protection of ecologically-sensitive areas or issues guidelines for matters under the EPA.

The important environmental legislations applicable to the proposed project are given in **Table 2.1 below:**

Name	Scope of Objective	Key areas	Operational agencies
Water (Prevention and Control of Pollution) Act 1974	To provide for the prevention and control of water pollution and enhancing quality of water	Control of Sewage and industrial effluent discharges	Central and State Pollution Control Boards
Air (Prevention and Control of Pollution) Act 1981	To provide for the prevention and control of air pollution	Controls emission and air pollutants	Central and State Pollution Control Boards
Environment Protection Act 1986 Environment Protection Rules 1989	To provide for the protection and improvement of environment	An umbrella Legislation; supplements pollution laws	Central Government, nodal agencies MoEF, can delegate powers to department of environment
Forest (Conservation) Act, 1980 and Forest ConservationRules,1981	To provide for the protection and improvement of the forest	A legislation to protect forests and forest products	Central Government, nodal agencies MoEF, can delegate powers to Department of forest
Noise Pollution (Prevention & Control) Rules 2000	To control and take measures for abatement of noise and ensure that the level does not cross specified standards	Noise in urban area and around industrial sites	Central Government, nodal agencies MoEF, State governments
Hazardous Wastes (Management And Handling) Rules, 1989, 2001	To the adequate handling of hazardous materials or wastes	Hazardous waste generated from the industrial activity	Central Government, Nodal Agencies MoEF, CPCB

2.8 INDIAN LABOUR LAWS

All the workmen of the company are required to be governed by the relevant Indian Labour laws, which are stated below:

Workmen's Compensation Act, 1923

The Workmen's Compensation Act, 1923 is one of the important social security legislations. It aims at providing financial protection to workmen and their dependents in case of accidental injury by means of payment of compensation by the employers.

2.9 ELECTRICITY ACT 2003

The Act consolidates the laws relating to generation, transmission, distribution, trading and use of electricity and generally for taking measures conducive to development of electricity industry, promoting competition therein, protecting interest of consumers and supply of electricity to all areas, rationalisation of electricity tariff, ensuring transparent policies regarding subsidies, promotion of efficient and environmentally benign policies constitution of Central Electricity Authority, Regulatory Commissions and establishment of Appellate Tribunal and for matters connected therewith or incidental thereto.

2.10 OTHER APPLICABLE LAWS

There are a number of laws that are cutting across all sectors and development process of the country. Some of these are directly relevant especially during the construction stage of the proposed project and are listed in **table 2-2 below:**

TABLE 2-2: APPLICABLE GOVERNMENT OF INDIA ACTS

Applicable GOI Acts	Years	Objective
Minimum Wages Act	1948	As per this act, the employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government.
Child Labour Act	1986	This Act prohibits employment of children below 18 years of age in Building and Construction Industry covering Railway.
The Labour Acts	1988	The health and safety of workers employed in construction work etc.
Factory Act	1948	Health and Safety considerations for workers
Workmen Compensation Act	1923	This act provides for compensation in case of injury by accidents arising out of and during the course of employment
Contract Labour (Regulation and Abolition) Act	1970	This act provides for certain welfare measures to be provided by the contractor to contract labour.
The Building and other Construction Workers Act	1996	All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act. The employer is required to provide safety measures at construction work site and other welfare measures such as canteens, first-aid facilities, ambulance, housing accommodation for Workers near the Workplace etc.

2.11 SOCIAL, ENVIRONMENTAL, HEALTH & SAFETY POLICY

Azure is committed to and will strive towards meeting the IFC Performance Standards and requirements. Azure India Pvt. Ltd. believes that good Social, Environmental, Health and Safety (SEHS) performance of the company is vital for success in any business operation. Hence, Azure is committed to safeguarding the health, safety and security of every individual who is employed or contracted with us and the people who are in contact with our operations, and to protection of the environment in which we operate.

Azure will continually strive to achieve the following:

- Compliance with all the applicable SEHS laws, regulations and standards.
- Meeting of the organization's SEHS objectives with the requirements of our investors and shareholders.
- Prevent injuries at the workplace, pollution or contamination of the environment and disturbances to the community due to our activities.
- Develop and implement a management system to systematically identify, analyze, assess, treat, and monitor SEHS risks and impacts arising from our projects and operations.
- Define roles and responsibilities of our employees for implementing our SEHS management system across our projects and operations.

- Integrate stakeholder dialogue in the planning and implementation of our projects and maintain constructive relationships with the local communities

2.12 COMPLIANCE STATUS

Azure India Private Limited will comply with all the conditions according to IFC and will also adhere with its own SHES policies.

CHAPTER 3. PROJECT DESCRIPTION

3.1 INTRODUCTION

Azure Power India Pvt. Ltd. is planning to set up Solar PV Power Project of the capacity of 40 MW at Village- Hardhani, Tehsil Baori, Jodhpur District of the state of Rajasthan, India. A PPA has already been signed with Government of Rajasthan. The Energy generated to satisfy this PPA is 40 MW and the Solar PV power plant is required to commission by April 2015.

3.2 PROJECT LOCATION AND ACCESSABILITY

The proposed 40 MW Solar Power Project of Azure is developing in Hardhani village located in Baori tehsil respectively in Jodhpur district in the state of Rajasthan.

Jodhpur city is the administrative headquarter of the district. For the purpose of administration, the district is divided into four administrative subdivisions, viz., Jodhpur, Merta, Deedwana and Parbatsar. Each sub-division is divided into two tehsils viz., Jodhpur, Baori, Merta, Degana, Deedwana, Ladnu, Parbatsar and Nava.

The project site is in Hardhani village situated 65 Km away from Jodhpur City in North-East of Jodhpur district Rajasthan, India. The representative geographic coordinates of the project site are (26°46'01.2") North latitude and (73°12'17.1") East longitude**. Fig. 3-1 illustrates the location of the project site.**

Jodhpur (23°35'49.99" N, 72°57'30.73" E), the district headquarters, is approximately 65 km from the project site in the South-west direction.

The project site is connected to Jodhpur City by the National Highway 65. **The site accessibility map is shown in Fig 3-2.**

The nearest railway station (Jodhpur) and airport (Jodhpur) is at a distance of 70 KM from the project site respectively.

3.3 BASIC REQUIREMENTS

3.3.1 Land

The land requirement for the Project's Solar Power Plant depends upon the technology deployed i.e. Crystalline or Thin Film technology, conversion efficiency and solar radiation incident in the Project location. 250 Acres of land will be alloted for the Project's Solar Power Plant site which is sufficient to install 40 MW Solar PV Project. The site development work has to be carried out on proposed locations to make it suitable for installation of solar PV plant.

3.3.2 Water

Water will be required during the construction phase for cement preparation and domestic purposes and during the operations phase for panel washing. Domestic purposes will be arranged from tankers/public distribution system and for panel washing water requirement will be met by public distribution system as well.

3.4 WASTE WATER TREATMENT AND DISPOSAL SYSTEM

Waste Water

Wastewater is any water that is contaminated by anthropogenic / industrial processes with solids, temperature, chemicals and other impurities.

The effluent management scheme would essentially involve collection, treatment and recirculation / disposal of various effluents.

Since, water is used only for the cleaning purpose of solar PV modules to remove dust from it. The discharge water does not include any chemical or hazardous material.

Water runoff / discharge from the panels is likely to get evaporate or absorbed into the arid ground below the panels, and no drainage canal is required.

3.5 POWER EVACUATION

Power evacuation from the plant to 132/220 KV Bhawad grid sub-station through a 132/220 KV transmission line which will be developed by Azure. The electrical sub-station is located at Baori, approximately 6 km radial distance from the Project site. The route for the transmission line will be selected by Azure based on Techno-economic feasibility. The route is expected to be the shortest possible between the project site and the sub-station.

3.6 PROCESS OF POWER GENERTION

Photovoltaic (PV) is a method of generating electrical power by converting solar radiation into direct current electricity using semiconductors that exhibit the photovoltaic effect. Photovoltaic power generation employs solar panels composed of a number of cells containing a photovoltaic material. Materials presently used for photovoltaic include monocrystalline silicon, polycrystalline silicon, amorphous silicon, cadmium telluride, and copper indium selenide/sulphide Photovoltaic is the direct conversion of light into electricity at the atomic level. Some materials exhibit a property known as the photoelectric effect that causes them to absorb photons of light and release electrons. When these free electrons are captured, an electric current result that can be used as electricity.

3.7 LAYOUT

The Power Plant consists mainly of 3 components: Solar PV Array, Module Mounting Structure and the Power Conditioning Unit (PCU).[1]

The Solar PV Array converts the light energy of sunlight to direct current (DC) power. The Solar PV Modules used are grouped in an optimum number of strings with Module-to-Module cable connections.

The Module mounting structure is used to hold the Module in position. These Modules are seasonal on structures made of galvanized iron. The Modules are inclined at optimum horizontal tilt angle facing due south depending on the site location. The DC output from the Module strings in parallel is fed to combiner boxes. The DC power output from the combiner boxes is fed to a master combiner box. The output from the Master Combiner Boxes (MCB) is fed to the PCU. The AC power output of the PCU shall be fed to grid through step-up transformer with suitable electrical monitoring and metering system.

PV ARRAY

Number of PV Modules (290Wp)	138000
Total No. of modules	13800
Max Array Bus Voltage	1000V
No of Parallel String	6900
No of sub arrays	6900
No of Parallel strings per sub array	171 for 900KW and 3 for 20KW

PV Module Mounting Structure

- Seasonal tilt ground mounting structures shall be procured from various vendors approved by Azure and will be competent structural designer and fabricator.

Main Components of the ground mount system are as below:

- East West Beam to Top-Chord Assembly
- Top-Chord Assemblies to Top U-Clamp
- Top U-Clamps to Vertical Column
- Bottom U-Clamps to Vertical Column
- Diagonal Brace to Bottom U-Clamp
- Diagonal Brace to Top Chord Assembly
- East West Beam to North South Rail
- North South Rail to Module
- Lateral Brace to East West Beam and North

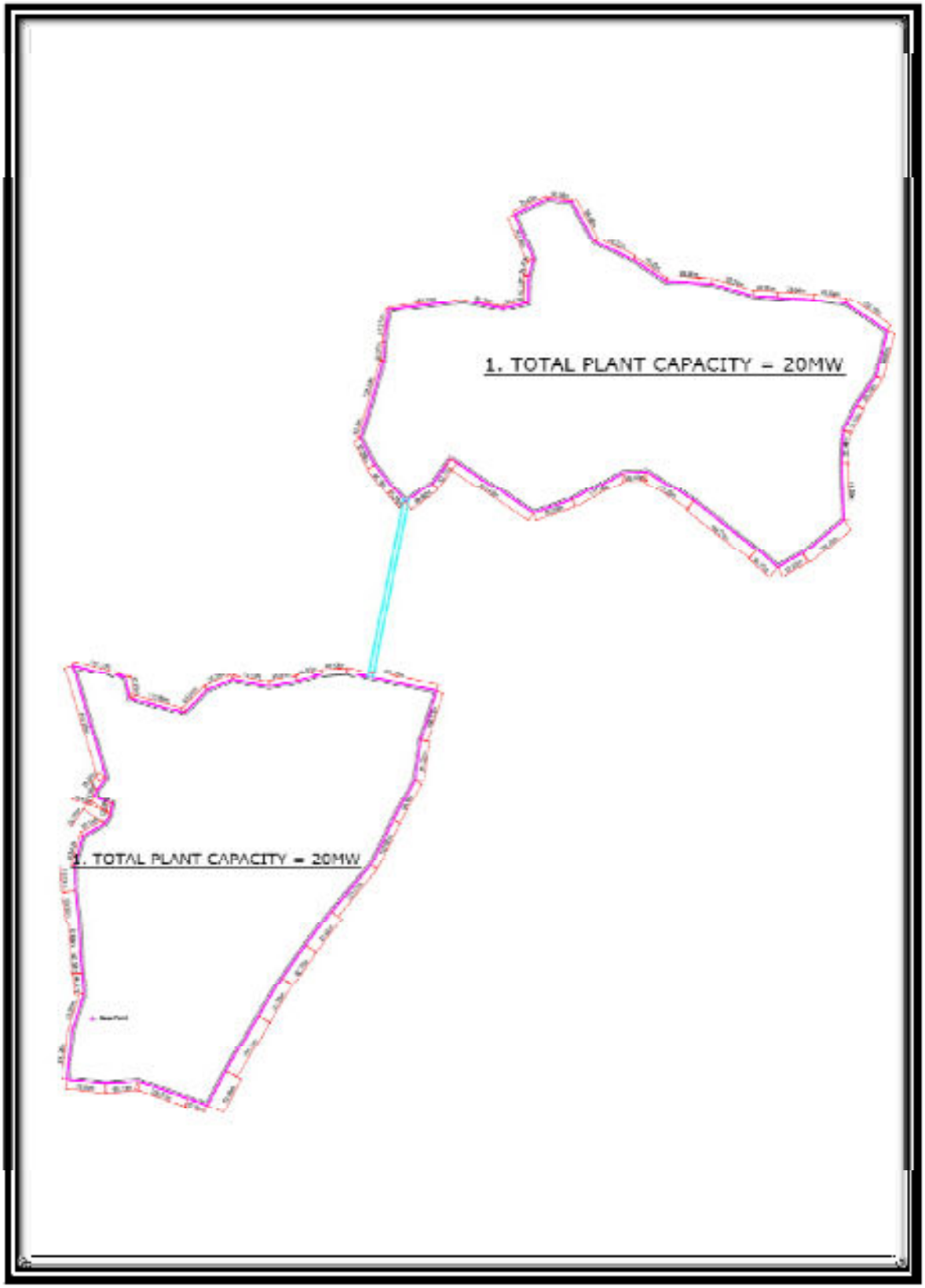
INVERTERS

- To convert DC solar power to AC and for linkage with the grid, special grid interactive outdoor inverters will have to be installed along with interfacing, protection and control mechanisms to operate in parallel with the grid. These will be housed on an outdoor inverter pad with canopy
- Inverters shall be rated 900 Kw having 1000V nominal DC input and 990V with 50Hz AC Output.
- Inverters shall be procured from global manufacturing leader SMA Solar Technology.
- The three-phase Grid Connected Inverter (GCI) system exports power generated from solar PV Array directly into the utility grid supply.
- Generally, the system operates and continues to feed available solar power into the grid when the control system detects that the solar radiation level is above a predetermined value and the grid

supply is within preset limits in voltage and frequency. The system will automatically disconnect from the grid if the grid voltage or frequency moves out of its operating range.

- The GCI system will switch over to a low power 'sleep' mode at night and during periods of low solar radiation and automatically 'wake up' when the insolation level rises above a preset point. Once the grid comes back into its operating range the inverter Module will synchronize and connect to the grid to export all the available solar energy.
- Typical Grid Connected Inverter System features are as follows:
    - High efficiency power conversion
    - Programmable simple control for flexible operation
    - Informative and concise textual fault alarms
    - Electronic over load and over current protection
    - AC and DC input isolation breakers
    - Control system 'self test' on initialization
    - True RMS metered voltage, power and current used in system control
    - On board local and remote SCADA facility
    - MOD-BUS

FIGURE 3.2 -PLANT LAYOUT



3.8 PLANT CONSTRUCTION & IMPLEMENTATION SCHEDULE

Project Implementation Schedule

An implementation schedule, outlining the sequence of major activities and the time required for engineering, construction, installation and commissioning of the 40MW solar PV power plant. The solar plant is expected to be commissioned and start exporting power to the grid before April 2015.

Figure 3-5: implementation schedule

S.NO	ACTIVITY	COMPLETION DATE
1	Award of EPC Contract	April – 2014
2	Site Mobilization	August – 2014
3	Basic Infrastructure Building	August – 2014
4	Detailed Engineering & Procurement	June – 2014
5	SPV module shipment	July – 2014
6	Shipment of BOP equipment	August – 2014
7	Commencement of erection	September – 2014
8	Construction of Evacuation system	August – 2014
9	Commissioning, Trial run & testing	April – 2015
10	Commercial Operation	April – 2015

3.9 POWER TRANSMISSION LINE

The power generated from the proposed solar power plant should be evacuated through 132/220KV transmission line to 132/220 KV Bhawad grid Sub-Station of RVPNL.

The power generated from the proposed solar PV power plant at LT level should be stepped up first to 11 kV level through suitably rated transformers & then to 132/220 kV level. The power from the Solar PV project should be evacuated through proposed 132/220 kV transmission line to Bhawad grid substation.

3.9.1 Power Evacuation

Azure has obtained the Grid Connectivity letter for SPV and will be getting grid connectivity at 132/220KV Bhawad Substation.

3.10 DETAILS OF TRANSMISSION LINES

The transmission shall have total length of approximately 6000 mts consisting of about 24 towers.
The land being mostly barren and the location being dry, it is expected that the transmission line RoW will not affect people`s livelihood. Although, the transmission line route is tentative in nature, Azure does not rule out the possibility of some minor changes till Azure obtains the RoW permission. During the finalization, Azure had selected the route in such a way that no land acquisition is needed.

3.10.1 Proposed Transmission System- Main features

The transmission towers are of self-supporting hot dip galvanized lattice steel type designed to carry the line conductors with necessary insulators, earth wires and all fittings under all loading conditions.

The tower shall be fully galvanized using mild steel or/and high tensile steel sections as specified. Bolts and nuts with spring washer are to be used for connections.

3.10.2 Route Alignment

The route alignment shall be carried out by the Government Approved contractor using satellite imageries of NRSA (PAN & LISS-III merged product) and Cartosat Imagery and Survey of India topographical maps (scale 1:50000) and in addition high resolution imagery will be required for developed areas as given in the Field Quality Plan. The alignment of the transmission line shall be optimal from the point of view of construction, maintenance, cost and minimizing damages.

3.10.3 Ground Clearance

The minimum ground clearance from the bottom conductor shall be according to the standard.

3.10.4 Clearance from Ground, Building, Trees etc.

Clearance from ground, buildings, trees and telephone lines shall be provided in conformity with the Indian Electricity Rules, 1956 as amended up to date.

3.10.5 Forest clearance

During detailed engineering the forest/non forest areas involved if any shall be identified and authenticated by concerned authorities. Forest clearance as per the requirements of the state/MoEF shall be obtained. However, preliminary survey shows that there is no forest land involved.

CHAPTER 4. EXISTING ENVIRONMENTAL & SOCIAL CONDITION

4.1 GENERAL

Rajasthan is located in the north-western part of the subcontinent. 40 MW Solar PV project is proposed in Hardhani village in Baori Tehsil of Jodhpur District, Rajasthan, is in western part of Rajasthan.

4.2 STUDY AREA

An area with in 2 km around the project can be considered as influence zone and hence it has been taken as study area to understand even setting in the vicinity of the proposed project. However, as the environmental setting is arrived based on secondary data, all available data has been used for the purpose of Environmental understanding.

4.3 DATA SOURCE

Secondary information collected from website:

1. http://Jodhpur.nic.in/,
2. http://www.rajasthan.gov.in/,
3. https://eosweb.larc.nasa.gov/,
4. http://www.census2011.co.in/news/384-Jodhpur-census-2011-highlights.html.
5. Survey of India toposheets no. 40N/B, 45B/1
6. Topographical map of Survey General of India,
7. Detailed Project Report
8. Site Social, Environmental, Health and Safety Assessment

4.4 TOPOGRAPHY

The project area is flat land with an average elevation of 990 feet above the main sea level. The area has a gentle slope towards the south direction. The drainage of the area is governed the subsurface drainage in the area is also very good owing to the presence of sandy soils. However, the contour survey will present exact picture of land which will be conducted after finalization of land.

4.5 GEOLOGY AND SOIL

The climate of the district is arid to semi-arid and the average annual rainfall is 1.26mm/day. The district forms a part of the Great Thar desert and is covered mainly by Aeolian sands masking the hard rocks. The various rock types of the district belong to the Delhi Super Group, the Erinpura, and Granite, the Malani igneous Suite and the Marwar Super Group and the palana formation. The rocks of the Alwar group are well exposed in the Eastern part of the district and comprise arkose, grit, and schist. The rocks of the Delhi Super Group have been intruded by the Sendra.

Mineral Resources: Thick gypseous beds of the district provide reserves of about 953 Million tones (Mt) from Dhankoria (270 20': 730 44') Bhadwasi (270 19': 730 40') and Jodhpur (270 12': 730 44') deposits. Extensive deposits of China clay are found in Khajwana area. Lignite occurrences have been reported from around metra road R.S.

Soil characteristics*:* Soil of the region falls within low rainfall zone with annual average of 1.26mm/day basis. The Soils are sandy loam, shallow depth red soils in depressions. **Table 6.9** shows nutrient level in the Jodhpur soil including area coverage of saline and sodic soil. The nutrient status of the Jodhpur soil is graded as medium to high level.

TABLE 4-1 FERTILITY STATUS- MAJOR NUTRIENTS & PROBLEMATIC SOILS OF JODHPUR DISTRICT – HARDHANI VILLAGE

S. No.	Panchayat Samiti	VILLAGE Name	% Soil having Normal pH	% Soil having Alkali pH	% Soil having Normal Ec	% Soil having Saline Ec	Nitrogen	Phosphate	Potashium
1	OSIAN	hardhani	30	70	100	0	L	L	M

4.6 SEISMIC HAZARD

Jodhpur town lies in low damage risk zone II. The area is less prone to earthquakes as it is located on comparatively stable geological plains based on evaluation of the available earthquake zone information. Figure 6.1 depicts the earthquake zones of India indicating Jodhpur in Zone II.

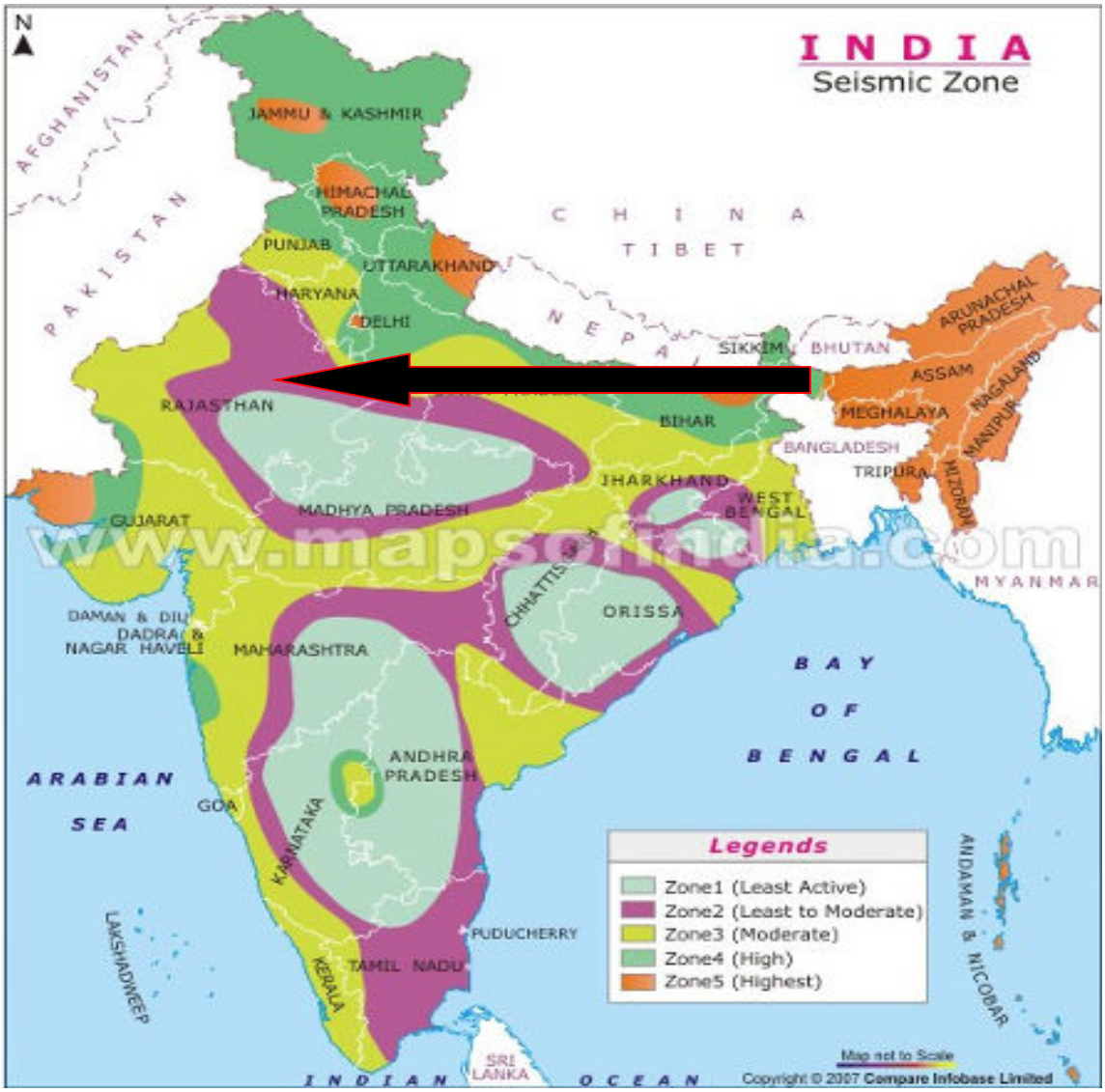


FIGURE 4-2: SEISMOLOGICAL MAP SHOWING PROJECT

4.7 WATER

The rainfall is low and as per PHED the entire Jodhpur city is considered dark zone from ground water exploitation point of view. Ground water analysis will be conducted during construction and compared with the standards (IS 10500:Indian Standards/Specifications for Drinking Water) reference values. The same will be communicated to Investors upon request.

4.8 LAND USE & CROPPING PATTERN

Land use of the Jodhpur district is shown in **Table below**

TABLE4-4: LAND USE & CROPPING PATTERN

Jodhpur	Area('000ha)	Percentage
1.Geographical Area	2256.4	37.51
2.Forest	6.996	0.12
3.Not Available for cultivation		
(A)Land put to non agriculture use	80.1	1.33
(B)Barren & uncultivated	145.3	2.42
Total(A+B)	225.4	
4.Other uncultivated and fallow land		
(C)Permanent pasture and other grazing land	121.9	2.03
(D)Land under misc. tree crops and groves not included in net area sown	0.08	0.001
(E)Culturable waste	40.6	0.67
Total(C+D+E)	162.58	
5.Fallow land		
(F)Old fallow land	322.7	5.36
(G)Current fallow land	283.7	4.72
Total(F+G)	606.4	
6.Net area sown	1254.6	20.86
7.Total cropped area	1378.6	22.92
8.Area sown more than once	124	2.06

(Source: Statistical Abstract Rajasthan 2009)

The primary land-use in the project area is non-agricultural and barren in nature with minimal industrial activity in the near vicinity of the site.

The major Kharif crops cultivated in the area include pearl millet, cluster bean, Moth Bean, green gram and Sesame. Wheat is an important Rabi crop and its productivity is highest in the cultivated area in the district. Mustard cultivation is also becoming popular in the district. Onions, chilies, isabgol, garlic, ber,

are the important horticultural crops in the district. In fact the area is the highest producer of onion and chilies. The study area is not populated and area under human settlements is very negligible.

4.9 CLIMATE AND METEROLOGY

Jodhpur has a dry climate with a hot summer. Sand storms are common in summer. The climate of the district is conspicuous by extreme dryness, large variations of temperature & highly variable rainfall. The mercury keeps on rising intensely from March till June. These are the hottest months. The maximum temperature recorded in district is 51^0 C with 9^0 C as the lowest recorded temperature. The average temperature of the district is 41.3^0 C. The winter season extends from mid November to till the beginning of March. Rainy season is of a short during from July to mid September. There are five rain gauge stations, namely - Jodhpur, Jaswant Sagar, Jailwara, Surpura, Birari Bund in the district. The climatic trend over the year for the for the project site, which has been provided in Table below.

Table4-5: CLIMATOLOGICAL SUMMARY

Month	Mean rainfall (in mm/day)	Monthly average wind direction at 50 metre above the surface of the earth (in degree)	Monthly average wind speed at 50 metre above the surface of the earth in m/s	Average Minimum, Maximum Of The Daily Mean Earth Temperature (°C)	
				Max (°C)	Min (°C)
January	0.18	44	3.97	32.4	9.08
February	0.28	41	4.24	37.5	11.3
March	0.16	34	4.17	46.4	16.9
April	0.21	18	4.63	51.4	21.7
May	0.44	331	5.25	49.2	24.9
June	1.81	280	5.51	44.4	26.2
July	5.15	260	4.55	39.4	25.6
August	4.55	253	3.89	37.6	24.9
September	1.67	248	4.04	40.9	23.5
October	0.46	243	3.7	43.7	19.6
November	0.03	242	3.79	39	14.8
December	0.09	241	3.9	33.6	10.7
Annual Average	1.26	186.25	4.3	41.3	19.1

4.9.1 RAINFALL

Rainy season is of a short during from July to mid September. There are five rain gauge stations, namely - Jodhpur, Jaswant Sagar, Jailwara, Surpura, Birari Bund in the district. The average rainfall in the district is 1.26 mm/day on annual basis.

4.9.2 TEMPERATURE:

The mercury keeps on rising intensely from March till June. These are the hottest months. The maximum temperature recorded in district is 51.4^0 C with as the 9.08^0C lowest recorded temperatures. The average temperature of the district is 41.3 ^{0}C. The winter season extends from mid November to till the beginning of March.

4.9.3 WIND SPEED:

The average wind speed over the year is 4.3 m/sec, with a varying range of 3.7 m/sec in the month of October to 5.51 m/sec in June.

4.10 WATER BODIES

There is no perennial river, spring, stream, rivulet near project area.

4.11 ECOLOGY:

FLORA: The flora of the district is not rich owing to its geographical situation and scanty Rainfall. The south-eastern areas including a part of the northern tehsils of Ladnun and Didwana are much greener than the north –west region of district. The leaves of the khejri (*Prosopis cineraria*) are used as fodder. It exudes gum. The tree is considered holy by some people and is, therefore, worshipped.

FAUNA: Wild Animals: Chinkaras *(Gazella benetti)* and black bucks (*Antilope cervicapra*) which are rarely seen in this area are protected species under the Rajasthan Wild Animals and Birds Protection Act (1951). The small game only titars are found. Other fauna of the district consists of deer, hare, jackal (*Canis aureus)*, Pig and wild cat and birds. The common birds fluttering in the district include peencha, bulbul (*Labivanellus indicus),* sugan, chiri and mor *(Pavo cristatus)*

The district of Jodhpur is poor in forest resources. The total area under including hills is reported to be 69.96 Sq.km. which is 0.01 percent of total geographical area of the district. Scanty rainfall & other geographical constraints account for this. Most commonly found tree species are the ubiquitous khejri (Prosopis cineraria) and various types of acacia. Forest cover, just over 9% of the state, has dry teak forest, dry mixed deciduous forest, bamboo brakes and subtropical hill forests. Another tree that dots the arid desert land is the rohira (Tecoma undulata). Its pods have medicinal value that provides relief to abscesses while its wood is used to make furniture. Several types of grasses include the sewan (Lasiurus

sindicus), dhaman (Cenchhrus ciliaris), boor (Cenchrus jwarancusa) and bharut (Cenchrus catharticus). The bharut also serves as food for the poor at times of drought. The shrub Calligonum polygonoides, locally known as phog serves several purposes. It stabilises sand dunes, its wood is used for construction, the branches make camel fodder and its pods known as lasson are eaten as vegetables. Other shrubs like the leafless khair (Capparis decidua), ak (Calotropis procera) and thor (Euphorbia caduca) also have various uses. Khair provides strong and durable wood that is resistant to white ants and lastly also produces a fruit that is edible both fresh and preserved. The other two – ak and thor secretes a juice that is taken as a cough balm while the leaves of thor known as papri is eaten as a vegetable.

4.12 BASELINE SOCIO-ECONOMIC STATUS

General

The study was undertaken with respect to demography, occupational pattern, land holding, literacy rate and other important socio-economic indicators of each District to decipher the socioeconomic structure of the entire project area. This chapter elaborates the socio-economic profile of the Jodhpur district.

Approach Adopted

Secondary Data: Socio-economic profile has been compiled from latest census data (Primary Census Abstract, 2011).

Demographic Features

General

The district has total area of 22850sq.km. There are 7 sub-divisions, 339 inhabitated villages. Project site is located in Baori tehsil.

Highlights of Census as per 2011:

An official Census 2012 detail of Jodhpur, a district of Rajasthan has been released by director of Census operation in Rajasthan. Enumeration of key person was also done by census officials in Jodhpur District of Rajasthan.

In 2011, Jodhpur had population of 3685681 of which male and female are, 1924326 and 1761355 respectively. There was change of 6.08 percent in the population compared to population as per 2001.In the previous census of India 2001, Jodhpur District recorded decrease of 6.08 percent to its population compared to 2001.

The initial provisional data suggest a density of 161 in 2011 compared to 126 of 2001.Total area under Jodhpur district is about 22850sq.km.

Average literacy rate of Jodhpur in 2011 were 67.09 compared to 56.67 of 2001. If things are looked out at gender wise, male and female literacy rates were 80.46 and 52.57 respectively. For 2001 census, same figure stood at 72.96 and 38.64 in Jodhpur District. Total literate in Jodhpur District were 2075029 of which male and female were 1295900 and 779129 respectively.

With regard to the Sex ratio in Jodhpur as per 2011, it stood at 915 per 1000 male compared to 2001 census figure 907.The average national sex ratio in India is 940 as per latest reports of census 2011 Directorate.

CHAPTER 5. ANALYSIS OF ALTERNATIVES

Setting up of a solar power project involves selection of environmentally and techno economically suitable site, land characteristics, meteorology, infrastructure, grid availability, water availability, rail and road connectivity, accessibility and shading aspects etc. Before selecting the database the comprehensive review of the measured data of Indian meteorological Department (IMD) for similar and nearby locations of Hardhani village have been studied and compared.

With or Without Project

Electricity consumption in India steadily increased from 1995 to 2010, driven by high economic growth. Although India's generation and distribution capacity has grown significantly over the last decade, many parts of the country continue to suffer power shortages both in terms of unmet demand during peak periods and an overall energy shortage. Also, under the Electricity Act,
2003, the State Electricity Regulatory Commissions (SERCs) set targets for distribution companies to purchase certain percentage of their total power requirement from renewable energy sources. This target is termed as Renewable Purchase Obligation (RPO). This project will help on achieving both the demand-supply gap in energy requirement and RPO requirement.

Alternative Fuel

The only viable generating options for energy production to meet the supply-demand gap in the region are fossil fuel energy. India is already facing huge short fall in fulfilling the coal requirement for already existing thermal power plant. So, it is imperative to look for alternatives to fossil fuel based power generation to achieve long term power solution of the country.

Alternative Project Location

Before selecting the site location at Hardhani, Rajasthan, Azure had analyzed a set of probable locations on various parameters, important for success of any Solar PV plant. Azure found that each site location has its own unique advantage to offer. After completing the process, Azure come to the conclusion that Hardhani village site has many advantages Vis-a Vis other site locations considered for the selection process. On the basis of this process, Azure has shortlisted Hardhani as the site location for its upcoming Solar PV plant. This site is preferred as the land is barren and no community nearby.

CHAPTER 6. ANTICIPATED ENVIROMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

6.1 INTRODUCTION

The proposed project may have impact on the environment during construction & operation phases. During the construction phase, the impacts may be regarded as temporary or short-term; while long term impacts may be observed during the operation stage. Spatially the impacts have been assessed over the study area of 2 km radius of the project site.

The project has overall positive impacts by providing a competitive, cost-effective, pollution free reliable mode of Solar PV power. It will certainly meet the ever increasing Demand of Power and to bridge the Gap between Demand and Supply of Power.

6.2 POTENTIAL IMPACT GENERATION ACTIVITES

The construction and operation phase of the proposed project comprises various activities each of which may have an impact on environmental parameters.

During the construction phase, the following activities may have impacts on environment:

- Site Preparation
- Minor Excavation and Levelling
- Hauling of earth materials and wastes
- Cutting and Drilling
- Erection of Concrete and Steel Structures
- Road Construction
- Clean Up Operation
- Landscaping and afforestation

6.3 IMPACT DURING CONSTRUCTION PHASE

The environmental impact during construction phase is localized and of short term magnitude. However, as this project land shall be govt. barren land, the change in land use will be minimum. Impact is primarily related to the civil works and due to erection of the equipment. The details of the activities and probable impact are brought out in table below:

TABLE 6.1: IDENTIFICATION OF ACTIVITIES &PROBABLE IMPACTS (CONSTRUCTION PHASE)		
CONSTRUCTION ACTIVITIES	**ENVIRONMENT ATTRIBUTE**	**PROBABLE IMPACTS**
Land Acquisition	Land	❖ No significant impact on land-use is expected
	Socio-Economic	❖ No Impact due to Rehabilitation & Resettlement Issues is expected as govt. wasteland is being acquired for the project.
Site clearing and Levelling (cutting, stripping, excavation, earth movement, compaction)	Air	❖ Fugitive Dust Emissions ❖ Air Emissions from construction equipment and machinery
	Water	❖ Run-off from construction area
	Land	❖ Loss of top soil
	Ecology	❖ Minimal loss of vegetation as the site is has barren land with almost no vegetation.
Transportation and Storage of Construction Material/ Equipment	Air	❖ Air Emissions from vehicles ❖ Fugitive Dust Emissions due to traffic movement
	Water	❖ Run-off from Storage Areas of construction Material
	Public utilities	❖ Increased flow of traffic
Civil Construction Activities	Air	❖ Air Emissions from construction machinery ❖ Fugitive Dust Emissions
	Water	❖ Run-off from Construction Areas
Mechanical and Electrical Erection Activities	Air	❖ Air Emissions from Machines / activities
Transportation and Disposal of Construction Debris	Air	❖ Air Emissions from Transport Vehicles ❖ Fugitive Dust Emissions due to Movement of Traffic
	Water	❖ Run-off from Disposal Areas
	Soil	❖ No Conversion of land into waste land as already barren land.

6.4 IMPACT ON LAND USE

The land required for the proposed expansion project is about 250 acres. The construction activities attract a sizeable population and the influx of population is likely to be associated with construction of temporary hutments for construction work force, having an effect on land use pattern of the areas surrounding the project. However, this impact is envisaged to be insignificant due to following reasons.

- Temporary labour colonies/camps shall be situated in the areas already acquired for the project.
- It will be only a temporary change (restricted to construction period). After construction phase, the areas acquired by labour colonies shall be reverted back similar to preconstruction stage

6.5 IMPACT ON SOIL COVER

As the construction activities for the Proposed Plant would be confined in the wasteland, the impact on soil will be minimal and confined. Only excavation and filling is required during construction. The construction activities result in loss of vegetation cover (grass and shrubs) and topsoil in the plant area. No adverse impact on soil in the surrounding area is anticipated.

6.6 IMPACT ON SOLID WASTE

Solid waste during the construction phase consists primarily of scrapped building materials, excess concrete and cement, rejected components and materials, packing and shipping materials (pallets, plastics etc.) and human waste. During the construction there will be generation of garbage, for which designated practices of solid waste disposal shall be followed as per Azure SHES-Management System.

6.7 AIR IMPACT

As the proposed project is Solar PV Project, the impact during construction of is expected to be minimal as a Greenfield Project plant.

Particulate matter in the form of dust would be the predominant pollutant affecting the air quality during the construction phase. Dust will be generated mainly during excavation, back filling and hauling operations along with transportation activities. However, Water Sprinkling will prevent the dust generated due to construction activities going outside the project area.

6.8 NOISE IMPACT

The major noise generating sources during the construction phase are vehicular traffic, construction equipment like dozer, scrapers, concrete mixers, cranes, generators, pumps, compressors, rock drills, pneumatic tools, vibrators etc. The operation of this equipment will generate noise ranging between 75 – 90 dB (A).

As there are no nearby communities, within 5km of the Study are. Also the noise level is substantially lower near the plant boundary due to attenuation caused over the distance. Overall, the impact of generated noise on the environment during construction period is insignificant, reversible and localized in nature.

6.9 IMPACT ON WATER ENVIRONMENT

The construction personnel would be housed in temporary settlements. These settlements would discharge considerable amount of domestic wastewater. Stagnant pools of water would increase breeding of mosquitoes and generally create insanitary conditions. Azure Contractor will provide Soak pit with a depth of 2 meter to dispose liquid waste so that such waters do not form stagnant pools nor aggravate soil erosion.

Construction processes include fabrication of concrete and related water usage. Wastewater from construction activities would mostly contain suspended impurities. The waste water will be arrested before discharge.

6.10 ECOLOGICAL IMPACT

The project site is mainly barren land and there are no settlements near the site. The impact of the construction activities would be primarily confined to the project site. Since, the entire land is barren land with some xerophytic plants, shrubs. Thus, the site development works would not lead to any significant loss of important species.

6.11 SOCIAL IMPACT

6.11.1 Traffic Congestion

No overburden on the local transportation system is envisaged due to the proposed Project.

6.11.2 Labour Influence

Construction Phase

During construction activities, there will be a sizeable influx of population and labour colony will be constructed with basic amenities for the labours working on the project. This will have an effect on social fabrics of the areas surrounding the project. However, this impact is envisaged to be insignificant due to the following reasons:

- Temporary labour colonies shall be situated in the areas already acquired for the project.
- It will be only a temporary change (restricted to construction period). After construction phase, the areas acquired by labour colonies shall be reverted back similar to preconstruction stage

CHAPTER 7. ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN

7.1 INTRODUCTION

Environmental & Social Management Plan is an implementation plan to mitigate and offset the potential adverse environmental & social impacts of the project and enhance the positive impacts. Based on the environmental baseline conditions, planned project activities and impacts assessed, this section enumerates the set of measures to be adopted to minimize the adverse impacts. Process of implementing mitigation measures, execution, agencies responsible for their implementation and has been discussed in this chapter.

The project has overall positive impacts by providing a competitive, cost-effective, pollution free reliable mode of Solar PV power. It will certainly meet the ever increasing Demand of Power and to bridge the Gap between Demand and Supply of Power.

7.2 ENVIRONMENTAL & SOCIAL MANAGEMENT PROCESS

The ESMP has been designed within the framework of requirement under Indian legislation and IFC PS on environmental and socio-economic aspects.

The mitigation measures to be adopted for the implementation of the proposed project include the following:

- Environmental Management Plan;
- Occupational Health and Safety;
- Labour Working Conditions;
- Construction Labour Management;
- Environmental Action and Monitoring Plan;
- Public Consultation and Information Disclosure Plan;
- Grievance Redressal Mechanism;

The ESMP has been prepared considering life cycle approach of the project that Azure Green Tech Private Limited will own and operate.

The Project will develop and implement following management action plans under the ESMP:

a) *During Design Phase*

- Design of Clean Development Mechanism

b) ***During construction phase***

- Construction Labour Management Plan;
- Health and Safety Management Plan (Construction Phase);

c) ***For implementation during the Project life cycle***

Environment & Social Management Cell

Azure has established an Environment & Social Management Cell at Corporate and Site level, headed by Vice President to be responsible for day-today implementation of the Project. The Environment & Social Management Cell is responsible for coordinating and implementing all environmental and social activities. During project implementation, the ESMC will be responsible for reflecting the occurrence of new and significant impacts resulting from project activities and integrating sound mitigation measures into the EMP. The ESMC includes Social, Environmental, Health and Safety specialist and supporting staff, together forming the Environmental and Social Unit, appointed by Azure to look at right of way, environmental, social and safety issues. The ESMC will be empowered to implement safeguards planning and monitor implementation.

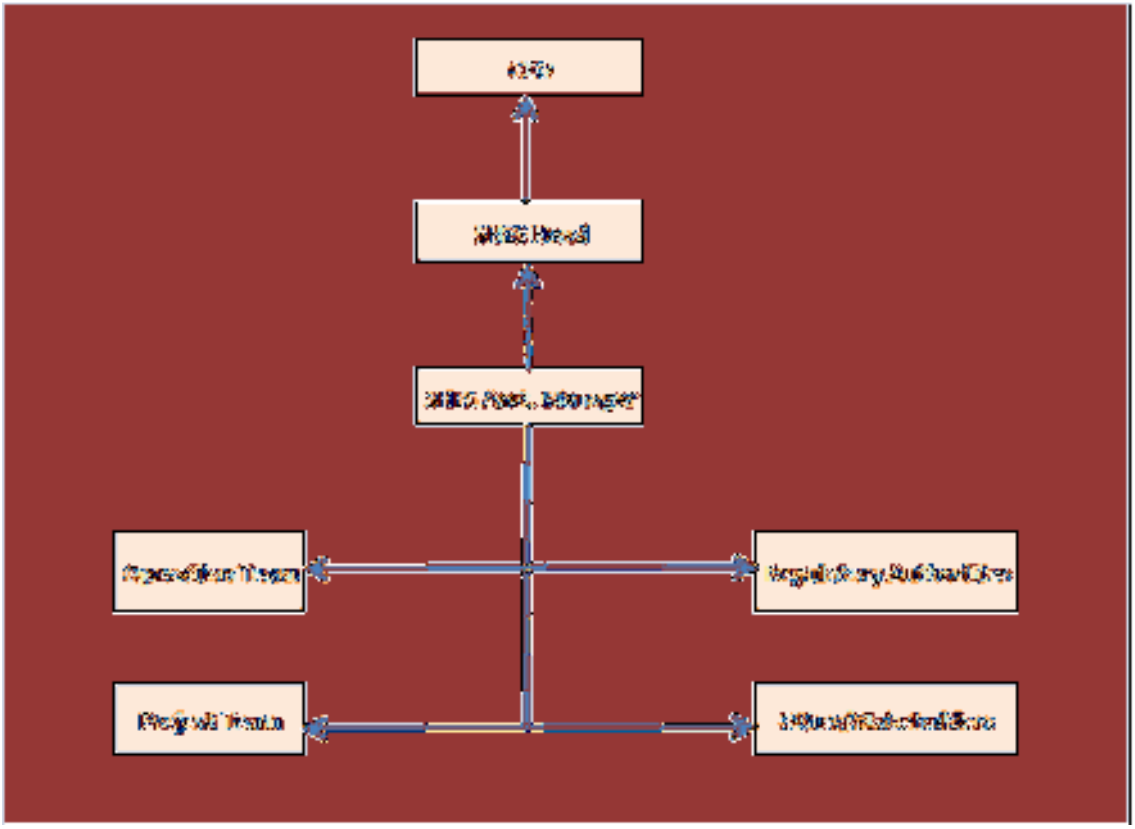
The Social, Environmental, Health and Safety specialist gives guidance to the Project Manager and his staff to adopt the environmental good practice while implementing the project. The Social, Environmental, Health and Safety specialist is responsible for implementing safeguard issues associated with the project through a site team composed of Azure site staff and contractor's staff. The duties of the Environmental and Social Unit of the ESMC at corporate level are to:

Monitor the implementation of mitigation measures during construction and operation phases of the project.

- Prepare suitable environmental management reports at various sites.
- Advice and coordinating field units' activity towards effective environment management.
- Advice during project planning/design cells on environmental and social issues while route selection of the alignment at the planning/design stage to avoid negative environmental impact.
- Provide training and awareness raising on environmental and social issues to the project/contract staff. The duties of the Environmental and Social Unit at site level are to:
- Implement the environment policy guidelines and environmental good practices at the sites.
- Advise and coordinate the contractor(s) activity towards effective environment management.
- Implement Social, environment, Health and safety manual.
- Carry out environmental and social Assessment in conjunction with project planning cell while route selection of the alignment at the planning stage to avoid negative environmental impact.

- Make the contractor staff aware of environmental and social issues so that EMP could be managed effectively.

The Organogram and the internal and external reporting lines of the SHES Management Team are presented in Figure 8-1.



7.3 ESMP DURING CONSTRUCTION AND OPERATION

The project activities will be executed in phased manner, Construction Phase and Operation phase. The major activities to be undertaken are described below.

7.3.1 CONSTRUCTION PHASE

The environmental issues during construction stage generally involve safety and public health issue. The Contractor is required to comply with the laws with respect to environment protection, pollution prevention, safety and other applicable law. Environmental pollution during the construction phase will be less but control of pollution during this phase is of considerable importance. The EMP is an executable part of Project, and the activities are to be guided, controlled, monitored and managed as per the provision provided. Following activities require attention during construction phase.

Construction/Labour Camp Management

- The labour camp construction, upkeep and maintenance at the 40 MW Solar PV project site is under the scope of the Azure contractors.

-500 labourers are likely to cause influx in the project area. A proper Construction Camp Development Plan has to be formulated to control degradation of the surrounding landscape due to the location of the proposed construction camp. Although, it is the responsibility of contractor to implement, Azure shall ensure that it is strictly followed as per the SHES-MS plan and procedure.

- Sufficient supply of potable water will be provided at camps and working sites. If the drinking water is obtained from the intermittent public water supply then storage tanks will be provided. All water supply storage may be at least 15m away from the toilets or drains. It is the responsibility of contractor to fulfil the water requirement during construction period. Azure will ensure that water will be supplied through water tanker from nearby area, where sufficient water is available.

- Adequate sanitation facility, Septic tank, will be provided.

- Health check-up will be conducted. These activities may be provided by the construction contractor.

- At every Camp first aid facility will be provided. Suitable transport will be provided to take injured or ill person to the nearest hospital.

- Adequate supply of fuel in the form of kerosene or LPG will be provided by the contractor to construction labours to avoid cutting of trees for cooking and other household activities.

- All the construction workers will be provided with proper training to handle potential occupational hazards and on safety and health, which include the following:

- Environmental Awareness program
- Engineering controls, work practices and protective equipment
- Handling of raw and processed material
- Emergency response

7.4 LABOUR AND WORKING CONDITIONS

Through a constructive employee-management relationship, and by treating the employees fairly and providing them with safe and healthy conditions, tangible benefits may be created, such as enhancement of the efficiency and productivity of their operations. The basic objectives is to ensure following.

- To establish, maintain and improve the employee-management relationship
- To promote fair treatment, non-discrimination and equal opportunity of employee, and compliance with national labour and employment laws
- To protect the employee by addressing child labour and forced labour
- To promote safe and healthy working conditions, and to protect and promote the health of workers by evolving safe working practices.
- To respect the worker's rights to freedom of association and the effective recognition of the right to collective bargaining, as per the relevant conventions of the International Labour Organization

The organization shall work to achieve these objectives; all relevant provisions of employee laws will be complied.

Working Relationship

All employees and workers directly engaged by the contracting agencies will be communicated their working conditions and terms of employment, including their entitlement to wages and any other benefits.

Workers Organizations

The company will not discourage workers from collective bargaining in a positive manner for mutual benefit.

Equal Opportunities

The company will base the employment relationship on the principle of equal opportunities and fair treatment and will not discriminate with respect to aspects of the employment relationship including recruitments and hiring, compensation, working conditions and terms of employment, access to training, promotion, termination of employment or retirement and discipline except on the basis of merit.

Equal Opportunities for Women

The Company will base the employment relationship on the principle of equal opportunities and fair treatment and will not discriminate on gender. Instead, the company will encourage the women participation and will frame appropriate policies to achieve the same.

Child Labour

The company will not employ children in any manner i.e. economically exploitative or is likely to be hazardous or to interfere with the child education or to be harmful to the child's health or physical, mental, spiritual, moral or social development. Children below the age of 18 years will not be employed.

Occupational Health and Safety

The company will provide the employees with a safe and healthy work environment taking into account inherent risks in its particular sector and specific classes of hazards in the works premises, including physical, chemical and biological hazards. The company will take steps to prevent accidents, injuries and disease arising from, associated with or occurring in the course of work by minimizing as far as reasonably practicable the causes of hazards.

TABLE 7.2: Major Environmental Mitigation Measures during Construction Phase

Mitigation Measure	Purpose	Failure consequence	Responsible Organization
Water sprinkling	Control of fugitive dust during construction and transportation activity	Increment in ambient SPM concentration	Contractors
Transportation of construction material in covered trucks	Control of fugitive dust	Increase in dust Emission	Contractors
Regular maintenance of transport vehicle and provision of acoustic cover on construction machinery	Control of Noise	Increase the noise level of surrounding area	Contractors
Provision of environmentally safe camping area for labourers	To provide a clean and healthy living condition for labours	Unhealthy living condition and spread of disease	Contractors

7.5 OPERATION PHASE

During operation phase of the proposed project pollution impacts are minimum. However, in order to limit within predicted impact levels and to further mitigate the impacts wherever possible on individual environment components, the following mitigation measures are recommended:

Environment Impact and Mitigation Measure

Possible Impact	Mitigation during planning and design	Mitigation during operation
Air Impact		• No Air Pollution
Safety of workers		• Workers would be provided with hand gloves ear muffs, safety boots, safety Goggles, helmets etc. • Workers should be trained to follow safe working practices
Transmission line	Avoid, as far as practicable, operations in environmentally Sensitive Areas, Eco-Sensitive Zones, Wetlands, Wildlife Sanctuaries, National Parks and Biosphere Reserves. If it is inevitable, Azure should obtain approvals as required under the relevant laws.	• Abate pollution in all its activities and operations. It should adopt the good practices of the sector. • Take due precautions to avoid Disturbance to human habitations, tribal areas and places of cultural significance and minimize the same wherever inevitable.

7.6 IMPACT DURING DE-COMMISSIONING OF THE PROJECT

This project involves a huge investment. While in Operation, the plant management will employ the best maintenance techniques and systems. These efforts result in extended life of the plant. Similarly efforts and investment for renovation and Modernization will result in further life extension of the plant. From the present trends, the life of the plant would not be less than 35 to 40 years. However when the plant becomes unviable due to major technological changes or due to regulations, decommissioning of the plant will be undertaken. This involves a series of steps to be planned and executed. The total operation can be broadly categorized in to De-operationalization and Dismantling phases. When modules are taken out service, they shall be recycled or environmental protective measures shall be undertaken as per the advice of module suppliers.

7.6.1 CONSTRUCTION AND ERECTION PHASE

The problems envisaged during construction and erection phase can mainly be due to accident. To overcome these problems, the contractors in charge of construction and erection activities have to provide with personal protective equipment to their workforce at their own cost. Azure site SHES team will monitor and advice them on regular basic for implementation of the same.

7.6.1.1 Air Environment

Dust generated as a result of clearing, levelling and site grading operations should be suppressed Using water sprinklers.

7.6.1.2 Noise Environment

All noise generating equipment used during the construction phase should be provided with noise control devices and properly maintained. Wherever required, personal protective equipment such as ear plugs, earmuffs etc. should be provided by the contractors to the persons working theirin:

7.6.1.3 Storage of Hazardous Materials

The only hazardous material which will be stored at site is transformer oil, but in low volumes not exceeding 4 litres. Storage will be done on paved and bunded surface within the control room building, thereby eliminating any risks of storm water, soil or groundwater pollution. Moreover, the company will ensure that transformer oil should be free of Polychlorinated Biphenyls. Hazardous wastes such as empty paint containers, empty transformer oil containers will be generated in very nominal quantities. Risk of soil contamination from accidental spillage of the above materials during storage and handling is very low, if general spill prevention measures are taken. Secondary containers shall be used for the same.

7.6.1.4 Safety Measures

The site should have necessary security arrangements to prevent entry of unauthorized personnel and proper control of hazardous materials on site. All the employees as well as contractor's labour should be trained in safety aspects related to their job, with a special emphasis on safe handling of material, safety in welding and fabrication, etc. All the personnel should be provided with safety equipments such as face shields, helmets, safety Goggles, safety shoes, hand gloves etc., as per the job requirement.

To ensure that the local inhabitants are not exposed to these hazards, the site should be secured by fencing and manned at entry points.

7.6.1.5 Labour Deployment and Labour Camp Management Plan

Azure shall draw a Labour Deployment & Welfare Management Plan for the proposed Solar PV project. The Contractor and the sub contractor shall ensure the compliance of the labour welfare arrangement plan:

Accommodation for Labour – Provision of Tents for accommodating labours:

- Accommodation for Women Labour- Separate provision of Tents for accommodating women labours
- Prevention from Insects/Snakes – Carbolic Acid bottles will be buried under the ground surrounding the perimeter of the Labour accommodation area to prevent them from the risk of Snakes/Insects

- Sanitation for Labour – Portable Toilets/WC will be provided for Labour. Waste water will be disposed in septic tanks/ soak pits.
- Sanitation for Women Labour- Separate Toilets/ WC will be provided for women labour. Waste water will be disposed in septic tanks/ soak pits.
- Water Arrangements – Treated Water will be made available at Site for Labour drinking purpose.
- Health arrangements - Tying up with Local Doctor for any exigencies at site. Also the doctor will make occasional visits to site for Health check-up of labour.

7.7 OPERATION AND MAINTENANCE PHASE

The problems envisaged during the operation and maintenance phase are accident, exposure to heat, noise, arc lights, chemicals etc. Suitable personnel protective equipments should be provided to all employees, likely to be exposed to these situations. The working personnel should be given the following personnel protective equipments:

- Industrial safety helmet.
- Zero power plain Goggles with cut type filters on both ends.
- Ear Plugs.
- Earmuffs.
- Safety belt/line man's safety belt.
- Leather hand gloves.
- Safety shoes.
- Gum boots.

7.8 WASTE MANAGEMENT PLAN

Scope & Purpose of the Plan

This Waste Management Plan identifies the wastes that are likely to be generated during the construction and operation of the proposed Plant and documents cradle to grave waste management practices to be employed for their collection, storage, treatment and/or disposal as Per Azure SHES-MS plan and Procedure.

Specifically, the waste covered by this WMP includes the following sources:

- Construction and commissioning of plant and the associated facilities
- Operation of plant and the associated facilities throughout the project life-cycle.
- Temporary accommodation during construction phase for the workers.

- Other operations like equipment maintenance, road construction, site preparation etc.
- Operation and maintenance of infrastructures both during construction and operation phase.

Waste management plan (WMP) is intended to serve as a guideline for the project proponent & the contractor(s) to manage wastes effectively during construction and operation phase. The contractor(s) should strictly followed the Waste management Plan of Azure and will be made as per the site conditions.

Solid and Hazardous Waste Management

The mitigation measures with respect to waste treatment, storage, handling and disposal during both phases of the project have been discussed below:

Construction Phase

- A waste inventory of various waste generated will be prepared and periodically updated.
- The excavated material generated will be reused for site filling and levelling operation to the maximum extent possible.
- The scrap metal waste generated from erection of structures and related construction activities will be collected and stored separately in a stack yard and sold to local recyclers.
- Food waste and recyclables viz. paper, plastic, glass etc will be properly segregated and stored in designated waste bins/containers. The recyclables will be periodically sold to local recyclers while food waste will be disposed through waste handling agency.
- Hazardous waste viz. waste oil etc will be collected and stored in paved and bunded area and subsequently sold to authorized recyclers. Necessary manifest for the same will be maintained.

Operational Phase

There should be no solid wastes likely to be generated during operation phase

Road Safety & Traffic Management Plan

The plan encompasses the addresses of community safety related impacts that may arise from the increased vehicular traffic due to movement of equipment/machineries and vehicles along the site access and approach roads particularly during construction phase. The plan will be regularly reviewed and as vehicle movement requirements are identified in detail

During Construction Phase

The following mitigation measures will be implemented during this phase:

- Project vehicular movement will be restricted to defined access routes.
- Proper signage will be displayed at important traffic junctions along the vehicular access routes to be used by construction phase traffic. The signage will serve to prevent any diversion from designated routes and ensure proper speed limits are maintained near residential areas.
- Any road diversions and closures will be informed in advance to the project vehicles accessing the above route. Usage of horns by project vehicles will be restricted near sensitive receptors viz. schools, settlements etc.
- Traffic flows will be timed wherever practicable during period of increased commuter movement in the day.
- Temporary parking facilities should be provided within the work areas and the construction sites to avoid road congestion.
- Vehicular movement to be controlled near sensitive locations viz. schools, colleges, hospitals identified along designated vehicular transportation routes.
- Routine maintenance of project vehicles will be ensured to prevent any abnormal emissions and high noise generation.
- Adequate training on traffic and road safety operations will be imparted to the drivers of project vehicles. Road safety awareness programs will be organized in coordination with local authorities to sensitize target groups viz. school children, commuters on traffic safety rules and signages.

During Operational Phase

Since limited vehicular movement is anticipated during operational phase considering only the daily movement of project personnel any impacts arising from the same can be effectively addressed through implementation of mitigation measures as discussed during the construction phase.

7.9 ENVIRONMENTAL MONITORING PROGRAMME

Regular monitoring of critical environmental parameters is of immense importance to assess the status of environment during plant operation. The monitored data can serve as an indicator for any change in environmental quality due to operation of the plant with respect to baseline environmental conditions, so that suitable mitigatory steps could be taken in time to safeguard the environment.

Monitoring indicators have been developed for each of the activity considering the mitigation measures proposed. Indicators have been developed for ascertaining the environmental quality and the

performance of the EMP implementation through Environmental Quality Indicators (EQI's) and Environmental Performance Indicators (EPI's) respectively which focus not only on quantifying or indexing activity-environment interactions that may potentially impact the environment but at the same time also help in comparing different components of environmental quality against previously established baseline values. Monitoring results would be documented, analyzed and reported internally to Head - HSE. Monitoring requirements (including monitoring frequency) have been presented in the following **Table 7.3**.

Table 7.3: Proposed Monitoring Requirements for the Proposed Project

A. Environmental Performance Monitoring

EPI No	Environmental Performance Indicator (EPI)	Monitoring Parameter	Location	Period & Frequency
A.	CONSTRUCTION PHASE			
	Air emissions from vehicles and machineries	• CO, HC based on emission factors • % of vehicles possessing valid PUCC Certificates	• Exhausts	Quarterly during construction phase
	Dust generated from site clearance/levelling	• Visual observation of dust generation	• Site & approach road	Daily during site preparation
	Noise emissions from vehicles and machines	• Noise pressure level in dB(A)	• Near noise sources (5m)	Quarterly during construction phase
	Sourcing of water	• Volume of water sourced and consumed	• Sourcing and usage areas	Daily during construction phase
	Community health and safety	• Complaints registered by the local communities • No. of. Accidents	• Grievance Records • Safety Records	Monthly during construction phase
	Occupational health and safety	• Health surveillance of workers Sanitation status of labour camps and canteen • Potable nature of drinking water viz. coliform, pH, TSS, Residual chlorine • Usage of proper PPEs • Safety performance Indicators viz. LTIs. Near misses, fatalities etc.	• Medical records • Labour camp maintenance records • Drinking water storage tanks • Construction site	Monthly during construction phase

EPI No	Environmental Performance Indicator (EPI)	Monitoring Parameter	Location	Period & Frequency
	Disposal of Sewage	-Visual observation of leaks, overflows etc -Odour	-Septic tank and soak pits	Daily during construction phase
	Surface run-off discharge	-Visual observation of water logging due to drainage disruption -CPCB Inland Water Discharge Parameters	-Areas abutting Construction site -Discharge point	One representative storm event every year
	Domestic waste generation, storage, handling and disposal	-Quantity of waste generated and recycled -Visual observation of waste segregation and storage conditions viz. usage of labelled and covered bins, Insect repellents etc. Awareness level of onsite workers	-Waste generating areas viz. canteen, labour camps etc	Weekly during construction phase
B	OPERATIONAL PHASE			
	Water sourcing and consumption	-Volume of water sourced and consumed	-Water usage Areas	Daily during operational phase
	Community	-Complaints registered by the local communities -No. of. Accidents	-Grievance Records -Safety Records	Monthly during operational phase
	Occupational health and safety	-Health surveillance of workers -Sanitation status of onsite office building and canteen -Potable nature of drinking water viz. coliform, pH, TSS, Residual chlorine -Usage of proper PPEs -Safety performance Indicators viz. LTIs. Near misses, fatalities etc	-Medical Records -Office building Maintenance records -Drinking water storage tank -Operational sites	Monthly during operational phase Daily during operational phase

B) Environmental Quality Monitoring

EQ I No	Environmental Quality Indicator (EQI)	Monitoring Parameter	Location	Period & Frequency
	CONSTRUCTION PHASE			
	Ground water quality	IS 10500 parameters		Once in a Life cycle of the Project
	OPERATIONAL PHASE			
	Ambient Noise quality	Measurement of Noise Pressure Level in dB(A)	Nearest receptor viz. villages, schools, ecological habitat	Yearly during Operational phase

7.10 SOCIAL MANAGEMENT PLAN

Since the land is barren in nature with no settlement, the scope of social management plan is negligible. However, once the land is finalized and human settlements evaluated, a proper social management plan with adherence to IFC Performance standard, Indian Legislation and Azure SHES-Management System will be incorporated in ESIA.

7.11 RESETTLEMENT BUDGET AND FINANCING PLAN

Azure will obtain land on lease for 250 acres from Government which is barren and optimum land for the project. The project would not result in physical and displacement as these lands are all barren and vacant.

7.12 MONITORING AND REPORTING

Environmental and social key performance indicators will be developed in accordance to IFC guidelines and will be monitored at regular interval to identify changes in conditions, new issues, mitigation, successes and opportunities for improvement in consultation and disclosure. The monitoring results will be reported as required, and will be available to the public.

CHAPTER 8. GRIEVANCE REDRESSAL MECHANISM

Environmental and social grievances will be handled in accordance to the project grievance redress mechanism incorporated in Azure SHES-MS plan and procedure. Open and transparent dialogue will be maintained, in compliance with IFC safeguard policy requirements. The Grievance Redress Mechanism for the project provides an effective approach for complaints and resolution of issues made by the affected community in reliable way. This mechanism will remain active throughout the life cycle of the project.

8.1 GRIVENCE REDRESSAL PROCEDURE

8.1.1 Source of grievance

The Company may receive the complaint/grievance from any of the following sources.

- Employees
- Stake holders
- Local Communities
- By register kept at Local Gram Panchayat

8.1.2 Lodging of grievance

The Complainant can lodge his Grievance with any of the following:

- Complaint/Grievance received from the above said sources will be maintained under the responsibility of Azure and logged out in the grievance form/register available on demand from the security room at the entire project site. Project staff shall assist community members who are not able to fill out the form by themselves.
- Compliant/Grievance Shall not be disclosed to the external environment if the party desired to do so.
- A properly completed Grievance must be submitted in order to register a grievance. As outlined above, Project personnel will assist community members where required to complete a Grievance Form. The Grievant will be given a copy of the completed Grievant Form for his/her records.
- Telephone Numbers:(Working hours:10 am to 6pm)
  011-49409803 (Accessible from any Mobile and Landline within India)

8.2 PROCESS

8.2.1 Complaint and Grievance Cell

The committee will be responsible for handling, management and redressal of all Grievance received which will be formed. Any Grievance received in any mode (Grievance form, letters, phone calls, etc.) shall be referred to the committee within 24 hours from the time of the receipt of the Complaint. The committee shall follow the procedures for resolving the complaint as given below.

8.2.2 Intimation of Grievance

On receipt of a complaint the committee shall take the following steps:

- A written acknowledgement shall be sent to the Complainant within three (3) working days from the date of receipt of any Complaint/Grievance.
- The committee shall communicate the acceptance along with the acknowledgement.
- All complaints received by the committee shall be forwarded to the manager responsible immediately.
- In case of additional requirements raised, the project staff shall interact with the Complainant for the document requirements and upon receipt shall forward the documents to committee.

8.3 GRIVENCE RESOLUTION

The Committee shall endeavor to resolve the Complaint/Grievance within (ten) 10 working days from the date of receipt of the Complaint/Grievance. The committee shall communicate the Company's decision and the same would inter-alia contain the following:

- Resolution and the details of the resolution offered or reasons of rejection.
- Process to pursue further, if the customer is dissatisfied with the resolution.

The committee shall treat the Complaint/Grievance as closed if there is no response from the Complainant to the communication sent by the Company, within 10 from the date of receipt of the said communication.

8.4 CLOSURE OF GRIEVENCE

The Committee shall consider the Complaint as disposed of and closed when.

- The Committee has resolved to the request of the Complainant fully.
- Where the Complainant has indicated in writing, acceptance of the response of the Company.

- Where the Complainant has not responded to the Company within 8 weeks of the Company's written response.
- Where the Grievance Redressal Officer or management has certified that the Committee has discharged its contractual, statutory and regulatory obligations and therefore closes the complaint.

CHAPTER 9. CONCLUSION AND RECOMMENDATIONS

Impacts are manageable and can be managed cost effectively. Careful mitigation and monitoring, specific selection criteria and review/assessment procedures for projects have been specified to ensure that minimal impacts take place. The detailed design would ensure inclusion of any such environmental impacts that could not be specified or identified at this stage are taken into account and mitigated where necessary. Those impacts can be reduced through the use of mitigation measures such as correction in work practices at the construction sites, or through the careful selection of sites and access routes.

The selected land is located within the government land. Thus acquisition of land will not be required from the surrounding communities. Since proposed land is covered with shrubs and weed plants, thus there is no need for removal of trees for the construction of the Solar PV project.

The proposed project will have number of positive impacts and negative impacts to the existing environment as follows:

- Significantly improvement in the economic activities of the surrounding areas due to generation of both direct and indirect employment opportunities.
- There will be no removal of trees for the transmission line, which is the main positive impact to the proposed project area. Compensatory afforestation will take place where tree removal is unavoidable.
- Environment pollution due to cut and fill operations, transportation of construction material, disposal of debris, nuisance from dust,noise,vibration are the short term negative impact due to proposed project.

Based on the environmental and social assessment conducted for the Project, the Potential adverse environmental impacts can be mitigated to an acceptable level by adequate Implementation of the mitigation measures identified in the EMP.

CONCLUSIONS

An environment and social analysis has been carried out looking at various criteria such as topology, air, water, ecology, demography of the area, climate and natural habitat, community and employee health and safety etc. The impact analysis, found that due to careful consideration of environmental and social aspects during route and site selection by Azure, no major adverse impacts are expected. There is no adverse impact on the migration of habitat, any natural existing land resources and effect in the regular life of people. The environment and social impact associated with transmission line project is limited to the extent of construction phase and can be mitigated through a set of recommended measures and adequate provision for environment and social impacts which cover monitoring, measuring and mitigation.

From this perspective, the project is expected to have a small "environmental footprint". No endangered or protected species of flora or fauna are reported at any of the subproject sites. Adequate provisions have been made for the environmental mitigation and monitoring of Predicted impacts, along with their associated costs. Adverse impacts if noticed during Implementation will be mitigated using appropriate design and management measures.

Hence, proposed Azure project have no any adverse environmental and social impact & shall be Pollution free Renewable source of Power.

Annexure 9

ADB Prohibited List of Activities

ATTACHMENT 1: ADB PROHIBITED INVESTMENT ACTIVITIES LIST (PIAL)

The following do not qualify for Asian Development Bank financing:

(i) production or activities involving harmful or exploitative forms of forced labor[10] or child labor;[11]

(ii) production of or trade in any product or activity deemed illegal under host country laws or regulations or international conventions and agreements or subject to international phaseouts or bans, such as (a) pharmaceuticals,[12] pesticides, and herbicides,[13] (b) ozone-depleting substances,[14] (c) polychlorinated biphenyls[15] and other hazardous chemicals,[16] (d) wildlife or wildlife products regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora,[17] and (e) transboundary trade in waste or waste products;[18]

(iii) production of or trade in weapons and munitions, including paramilitary materials;

(iv) production of or trade in alcoholic beverages, excluding beer and wine;[19]

(v) production of or trade in tobacco;[19]

(vi) gambling, casinos, and equivalent enterprises;[19]

(vii) production of or trade in radioactive materials,[20] including nuclear reactors and components thereof;

(viii) production of, trade in, or use of unbonded asbestos fibers;[21]

(ix) commercial logging operations or the purchase of logging equipment for use in primary tropical moist forests or old-growth forests; and

(x) marine and coastal fishing practices, such as large-scale pelagic drift net fishing and fine mesh net fishing, harmful to vulnerable and protected species in large numbers and damaging to marine biodiversity and habitats.

---

[10] Forced labor means all work or services not voluntarily performed, that is, extracted from individuals under threat of force or penalty.

[11] Child labor means the employment of children whose age is below the host country's statutory minimum age of employment or employment of children in contravention of International Labor Organization Convention No. 138 "Minimum Age Convention" (www.ilo.org).

[12] A list of pharmaceutical products subject to phaseouts or bans is available at http://www.who.int.

[13] A list of pesticides and herbicides subject to phaseouts or bans is available at http://www.pic.int.

[14] A list of the chemical compounds that react with and deplete stratospheric ozone resulting in the widely publicized ozone holes is listed in the Montreal Protocol, together with target reduction and phaseout dates. Information is available at http://www.unep.org/ozone/montreal.shtml.

[15] A group of highly toxic chemicals, polychlorinated biphenyls are likely to be found in oil-filled electrical transformers, capacitors, and switchgear dating from 1950 to 1985.

[16] A list of hazardous chemicals is available at http://www.pic.int.

[17] A list is available at http://www.cites.org.

[18] As defined by the Basel Convention; see http://www.basel.int.

[19] This does not apply to subproject sponsors who are not substantially involved in these activities. Not substantially involved means that the activity concerned is ancillary to a subproject sponsor's primary operations.

[20] This does not apply to the purchase of medical equipment, quality control (measurement) equipment, and any equipment for which ADB considers the radioactive source to be trivial and adequately shielded.

[21] This does not apply to the purchase and use of bonded asbestos cement sheeting where the asbestos content is less than 20%.

Annexure 10

The filled-in Rapid Environmental & Social Assessment Checklist and Environmental & Social Categorization form

SOLAR ENERGY

Rapid Environmental Assessment (REA) Checklist

Country: LOAN 3186-IND: CLEAN ENERGY FINANCE INVESTMENT PROGRAM-TRANCHE I

Subproject Title: 40 MW Capacity Solar Power (PV Technology) Project Proposed by M/s Azure Green Tech Private Limited near Nandiyakalan and Hardhani Village Jodhpur District , Rajasthan under funding assistance of IREDA,

DATE:: November - 2014

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?		√	The Project site spread over an area of 101 hectares of barren State Government located near NandiyaKalan & Hardani Village, Jodhpur District, Rajasthan
Physical cultural heritage site		√	The Project site has no cultural heritage site, special habitats for biodiversity, ecologically sensitive areas, legally protected areas, special habitat areas, wetlands, mangroves or estuaries or coastal areas within a radius of 10 km **(Refer Exhibit 1)**
Located in or near to legally protected area		√	Not Applicable
Located in or near to special habitats for biodiversity (modified or natural habitats)		√	Not Applicable
Wetland		√	Not Applicable
Mangrove		√	Not Applicable
Estuarine		√	Not Applicable
Offshore (marine)		√	Not Applicable
B. Potential Environmental Impacts Will the Project cause…			
large scale land disturbance and land use impacts specially due to diversion of productive lands?		√	The site identified for the Project is a barren, uncultivated land and therefore does not involve diversion of productive lands and associated land use impacts thereof. (**Refer Exhibit 2 for Photographs of Site**).
Involuntary resettlement of people? (physical displacement and/or economic displacement)		√	The Project will not involve physical displacement of people and free of any human habitations. However, this aspect is being separately assessed by Social Safeguards Specialist.
Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	The Project will not involve disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups. However, this aspect is being separately assessed by Social Safeguards Specialist.

Screening Questions	Yes	No	Remarks
noise, vibration and dust from construction activities?	√		The project will not involve any major construction activities. The limited noise and dust levels at project site during the construction phase site can be controlled through site specific mitigation measures. Vibration is not anticipated. There are no human settlements within 1 Km radius of project site.
an increase in local traffic during construction?	√		This will be limited to construction phase for the transportation of construction materials, plant and machinery required for erection of the Plant. The project site has a frontage to an all weather bituminous road, which at present has minimal traffic. Therefore, movement of vehicles during the project construction phase will not have any significant disruptions or diversions of local traffic. **(Refer Exhibit 3)**
Environmental disturbances such as soil erosion, land contamination, water quality deterioration, air pollution, noise and vibrations during construction phase?	√		The environmental disturbances will be almost insignificant as the construction and erection of proposed solar power project will not involve any major civil works and all construction related impacts can be mitigated/controlled through site specific management measures through an EMP. Moreover, there are no human settlements within 1 Km radius of project site.
Aesthetic degradation and property value loss due to establishment of plant and ancillary facilities?		√	Project site is in a remote location, and the nearest human settlement is 1 Km away. Therefore aesthetic degradation/visual impacts are not anticipated. On the contrary, the property/value of land in the surroundings may probable increase around the Project.
Changes in flow regimes of the water intake from surface water or underground wells due to abstraction for cooling purposes?		√	The Project will not require cooling water requirements. The freshwater requirements of the Project will be limited to meet the periodic cleaning /washing of PV panels. A typical Photograph showing cleaning of PV panels is shown in **Exhibit 4**. There are no surface water bodies in and around the project site within a radius of 10 km. The project region also falls within a Critical category and therefore tapping of the ground water resources is restricted. Therefore, the **fresh water will have to be brought to the project site through tankers. (Refer Exhibits 5)**

SOLAR ENERGY

Screening Questions	Yes	No	Remarks
Pollution of water bodies and aquatic ecosystem from wastewater treatment plant, from cooling towers, and wash-water during operation?		√	The Project operations will not involve any cooling towers and surface discharges of waste water. The cleaning of the PV panels also does not involve any surface discharges, resulting in water/soil pollution. The project operations do not involve usage of any chemical or hazardous materials and hence associated impacts are anticipated.
A threat to bird or bat life from colliding with the project facilities and/or being burned by concentrated solar rays?		√	The Project is based on Photovoltaic technology and therefore does not involve any threats to bird or bat life and/or threat being burned by concentrated solar rays. In any case, the Project region does not have any Important Bird Areas (IBAs)/ Bird Sanctuaries, Wild life Sanctuaries or National Parks or densely forested areas, within a radius of 10 Km. The project site as well as the entire region, support only stunted growth of Acasia Sp., which are not known to be nesting area of bats.(**Refer Exhibit 6**)
Industrial liquid (dielectric fluids, cleaning agents, and solvents) and solid wastes (lubricating oils, compressor oils, and hydraulic fluids) generated during construction and operations likely to pollute land and water resources?		√	Both construction and operation phases of Project will not involve use of any industrial liquids such as dielectric fluids, cleaning agents, and solvents and contaminant wastes like lubricating oils, compressor oils, and hydraulic fluids etc. which has likely potential to pollute land and water resources. In any case, there are no surface water bodies in and around the project site within a radius of 10 km. The construction phase impacts on the land within the project site can be prevented /mitigated by implementation of suitable site specific measures.
Soil/water contamination due to use of hazardous materials or disposal of broken or damaged solar cells (photovoltaic technologies contain small amounts of cadmium, selenium and arsenic) during installation, operation and decommissioning?		√	The impacts due to the broken or damaged PV solar cells can be prevented or mitigated through site specific measures like collection of all such broken and damaged PV cells for storing in an earmarked covered storage area with impermeable surfaces, prior to returning it to manufacturers or periodic disposal in an authorized hazardous waste disposal facilities approved by the State Pollution Control Board.(**Refer Exhibit 7** for such SPCB approved common hazardous waste facilities in Rajasthan)

Screening Questions	Yes	No	Remarks
Noise disturbance during operation due to the proximity of settlements or other features?		√	The Project operation phase will not have any major plant & machinery, causing significant noise and vibrations. The construction phase also will not involve any major construction activities. The limited noise and dust levels at project site during the construction phase site can be controlled through site specific mitigation measures. No settlements are located within a radius of 1 Km from the Project site.
Visual impacts due to reflection from solar collector arrays resulting in glint or glare?		√	Not significant as there are no human settlements in and around the proposed site within a radius of 2 km.
Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	Construction phase will require only a peak work force of 100-150 spread over 6 months period out of the total 8-9 months of construction period. The work force shall comprise a combination of both local labour and skilled force from outside. All the work force from outside will be provided accommodation with all facilities at the project site itself and the local labour is expected to return to their places of residence after work hours. The local labour may be provided with transportation facilities for commuting to the project from the project contractor.
Social conflicts between local laborers and those from outside the area?		√	This issue is not anticipated as all labour will be sourced locally and this project, in any case will not require labour in large numbers.
Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during construction, installation, operation, and decommission?		√	Not anticipated since the both construction and operation phases of the project will not involve any such major activities.
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials and wastes such as explosives, fuel and other chemicals during construction, and operation?		√	Not anticipated. However, the project will have an EHS plan to cover construction, operation and decommission phases of the Project to handle all risks to community health and safety issues, if any.
Community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		√	Not anticipated. All the structural components, plant and machinery of the project will be transported to the project site in a well packaged and dismantled condition and will be assembled within the project site. During the operation or de-commissioning stages, local community will have not unauthorized access to project site, which will be totally under watch and ward fenced asset. In any case, no human settlements are located within a radius of 1 km from the project site.

SOLAR ENERGY

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: LOAN 3186-IND:CLEAN ENERGY FINANCE INVESTMENT PROGRAM -TRANCHE I

Sector: Energy Division, South Asia Department

Subsector:

Division/Department:

Screening Questions		Score	Remarks[1]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	0	Not applicable to this Project. The site is not located in a flood prone or land slide area. Although, the project region, reportedly will experience a few dust storms, every year. However, no losses to civil structures or property loss or natural calamity has occurred as a result of dust storms.
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	All Civil Structures within the Project site will be designed for Wind load/speed and Earthquake resistant design. There are no rivers and sea in the project region within a radius of 10 km or even beyond.
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	1	The variations in the climatic conditions like extent of cloud cover, or sun shine, dust storms will have bearing on capacity utilization factor (CUF) of the Project. However, the Project design considers all such data and variations (based on historical database) as well as actual measurements at project site and therefore any such changes/variations are deemed to be already considered in the project.
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	1	Not likely all the known historical variations /extreme conditions will be considered in scheduling sand costing of the project
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s)	1	The variations in the climatic conditions like extent of cloud cover, or sun shine, dust storms will have bearing on capacity utilization factor (CUF) of the Project. However, the

[1] If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

	(e.g. hydro-power generation facilities) throughout their design life time?		Project design considers all such data and variations (based on historical database) as well as actual measurements at project site and therefore any such changes/variations are deemed to be already considered in the project. Not likely for the reasons mentioned above

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): √ **LOW**

Other Comments: A brief write up on the observations made during the visit to Project site along is given in Annexure-1.

Prepared by: **HARI PRAKASH**,
Environmental Specialist
ADB TA Consultant

ENVIRONMENTAL / SOCIAL CATEGORIZATION FORM

A. Instructions

The project team completes and submits this form to the Environment and Social Safeguard Unit (ESSU) for endorsement and for approval by the Chief Compliance Officer (CCO).
The classification of a project is a continuing process. If there is a change in the project components or/and site that may result in category change, the concerned unit must submit a new form and requests for recategorization, and endorsement by ESSU. The old form is attached for reference.
The project team indicates if the project requires broad community support (BCS) of tribal peoples communities. BCS is required when project activities involve (a) commercial development of the cultural resources and knowledge of indigenous peoples, (b) physical displacement from traditional or customary lands; and (c) commercial development of natural resources within customary lands under use that would impact the livelihoods or the cultural, ceremonial, or spiritual use that define the identity and community of indigenous peoples.

B. Project Data

Borrower: Indian Renewable Energy Development Agency Ltd , MNRE, Govt. of India	Financing Amount:
Technology: Photovoltaic Technology	Address/Contact:

C. Subject

☐ Environment	☐ Involuntary Resettlement	☐ Indigenous (Tribal) People

C. Categorization

☐ New ☐ Re-categorization — Previous Category

☐ Category A	☐ Category B	☐ Category C

D. Basis for Categorization/ Recategorization (pls. attach documents):

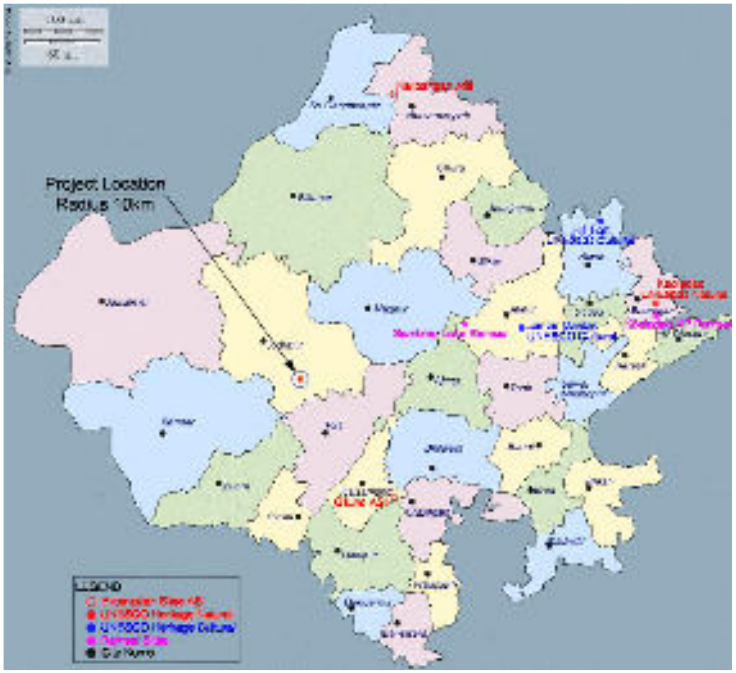
[√] Checklist and Type of Check List: Filled in REA Checklist
[√] Project and/or Site Description: Brief **write up on the observations made during the visit to Project site along with applicable Country Regulatory required materials are given in Annexure-1.**
[ ] Other (e.g., due diligence): Environmental Due Diligence Report on the Project Proposal is attached

E. Comments

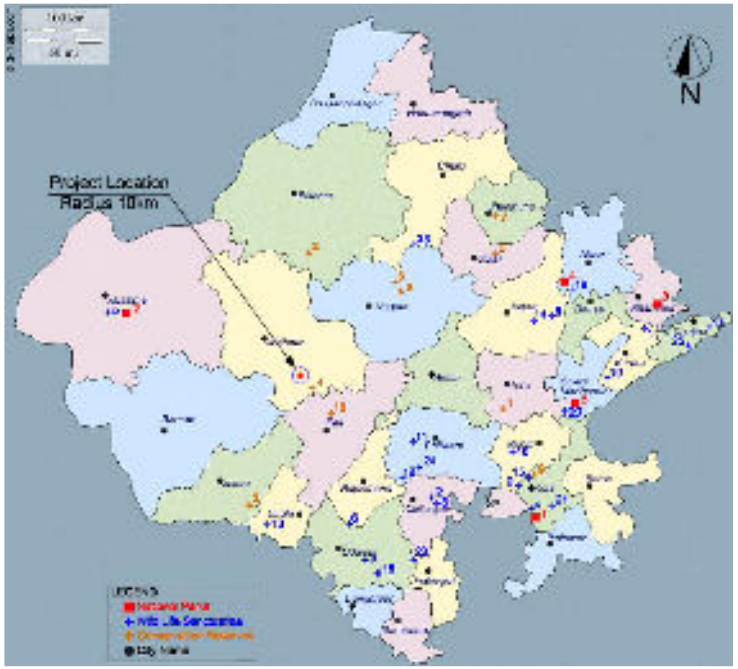
Technical Team: HARI PRAKASH	ESSU Comments

F. Approval

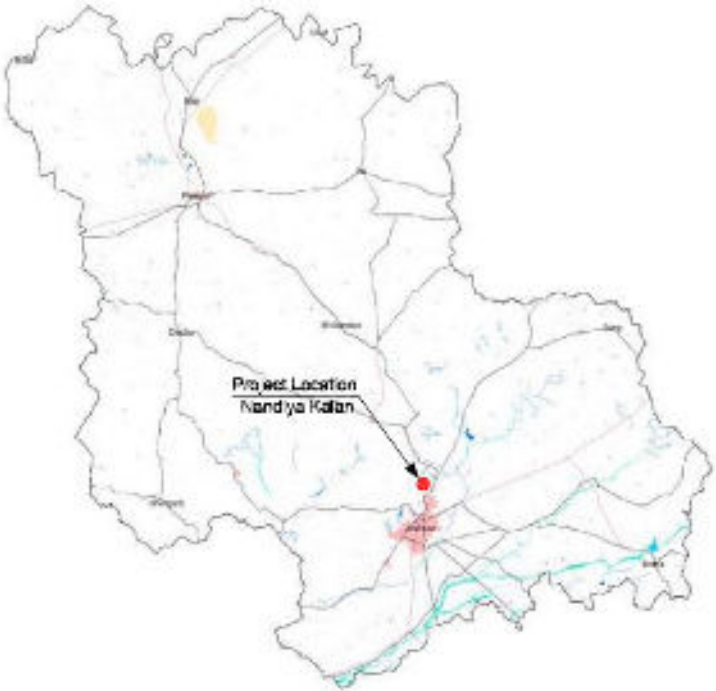
Proposed by:		**Endorsed by**:	
Technical Team Leader: HARI PRAKASH Date:  **Endorsed by**:		Head, ESSU: KHEKIHO YEPTHO Date: 	
		Approved by (Optional):	**ADB Concurrence**
Director of Technical Date:		Compliance Officer (if different) Date:	



Archaeological/Historical Monuments/Sites of National Importance in Rajasthan



Ecological Sensitive and Protected Areas of Rajasthan



Surface Water Bodies of Jodhpur District

Exhibit 1

Site View 1

Site View 2

Exhibit 2: Photographs Showing Different Views of the Proposed Project Site for 40 MW Capacity Solar Power (PV Technology) Project Proposed by M/s Azure Green Tech Private Limited near Nandiya kalan and Hardhani Village Jodhpur District , Rajasthan under funding assistance of IREDA

Exhibit 3: Photographs showing frontage of Project site having 2 lane Bituminous Road

Exhibit 4: Photograph showing cleaning of PV panels

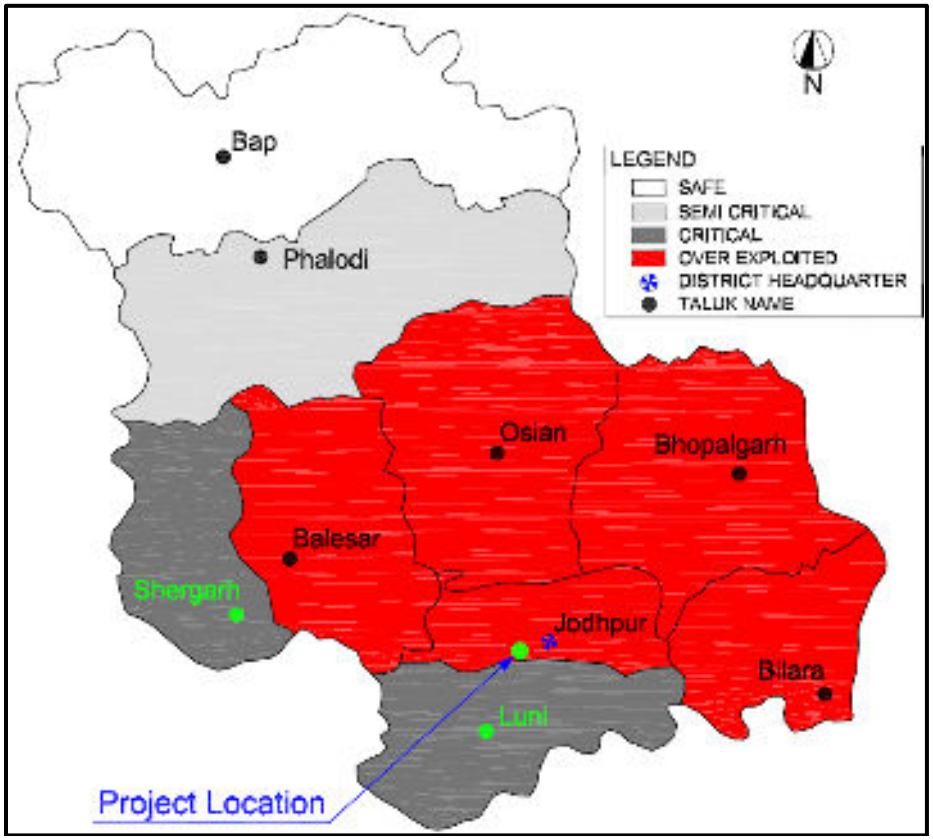


Exhibit 5: Zones of Jodhpur District, based on Ground Water availability

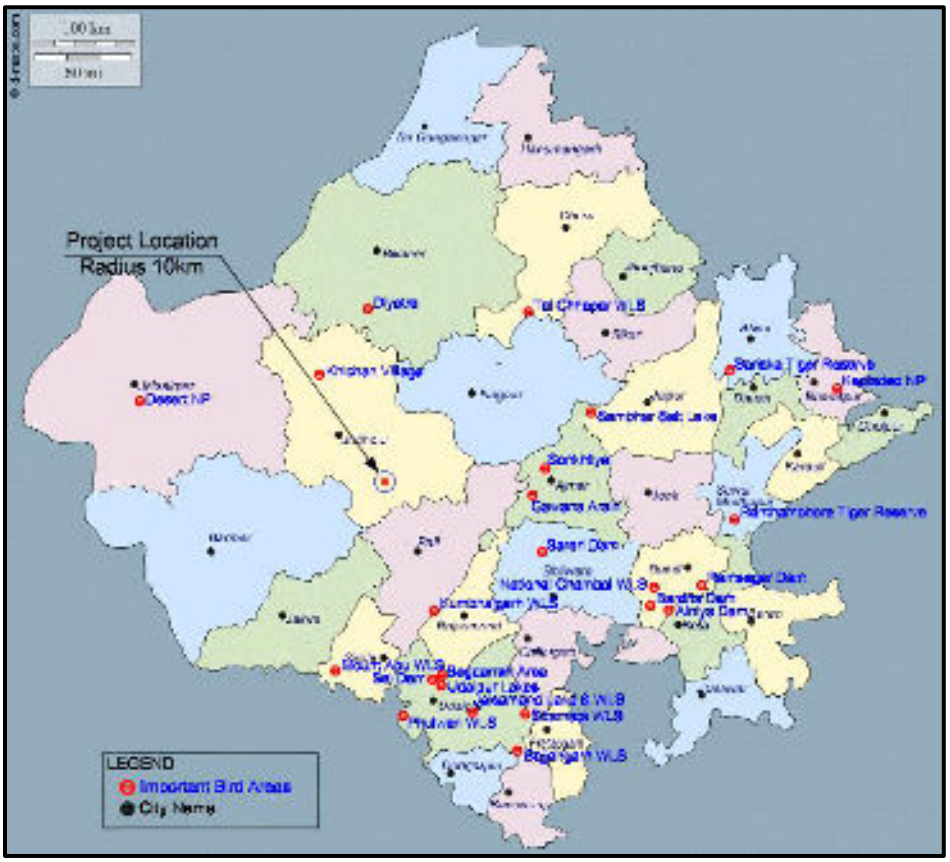


Exhibit 6: IBAs of Rajasthan

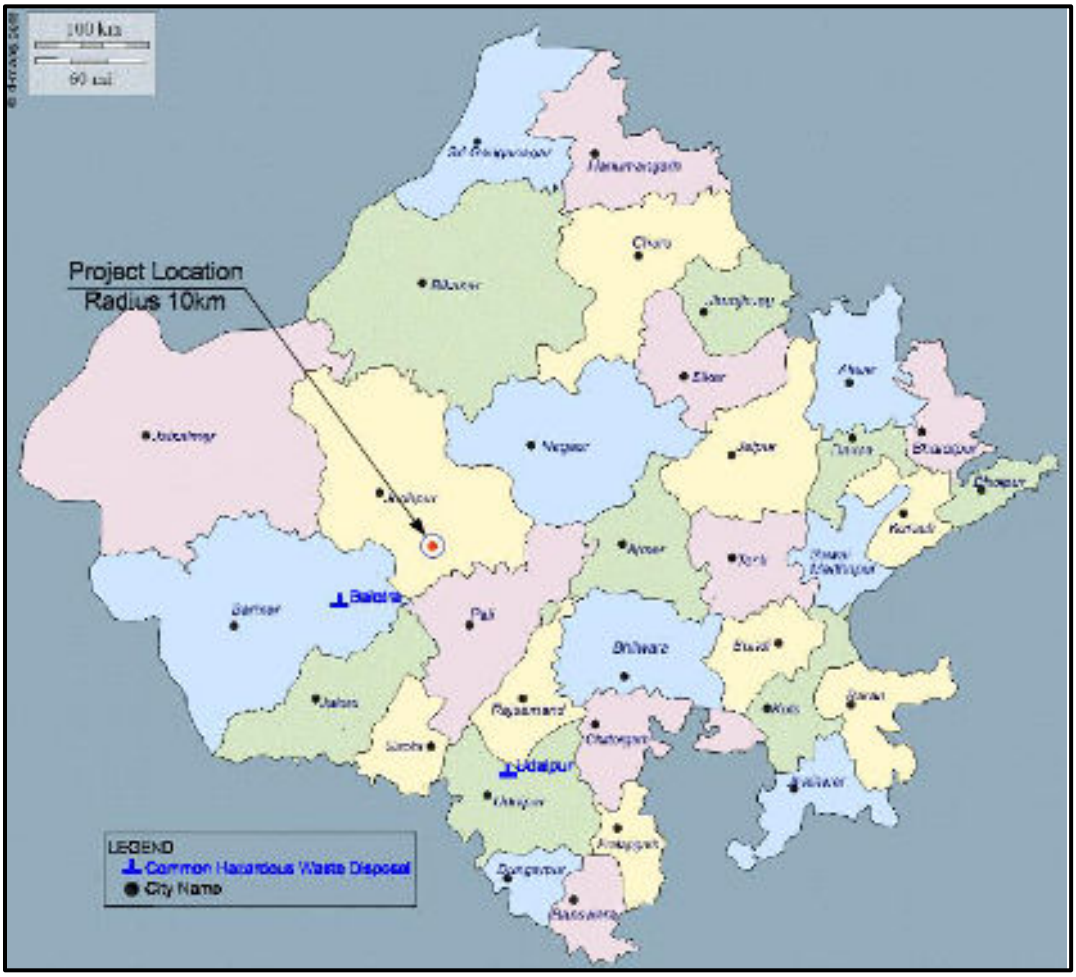


Exhibit 7: Common Hazardous Waste Disposal Facilities in Rajasthan

SOCIAL SAFEGUARDS SCREENING CHECKLIST

Subproject: 40 MW Solar Photovoltaic Power Plant at Nandiya Kalan & Hardhani Village in Baori Tehsils of Jodhpur District in the State Of Rajasthan developed by Azure Clean Energy Private Limited.

I. Involuntary Resettlement Impact Checklist

Probable Involuntary Resettlement Effects	**Yes**	**No**	**Not Known**	**Remarks**
Involuntary Acquisition of Land				
1. Will there be land acquisition?		√		The power plant is planned on existing government land. For the tower locations falling on private land the proponent has signed lease agreement by paying negotiated amount to the owners.
2. Is the site for land acquisition known?		√		
3. Is the ownership status and current usage of land to be acquired known?		√		
4. Will easement be utilized within an existing Right of Way (ROW)?		√		
5. Will there be loss of shelter and residential land due to land acquisition?		√		
6. Will there be loss of agricultural and other productive assets due to land acquisition?		√		
7. Will there be losses of crops, trees, and fixed assets due to land acquisition?		√		
8. Will there be loss of businesses or enterprises due to land acquisition?		√		
9. Will there be loss of income sources and means of livelihoods due to land acquisition?		√		
Involuntary restrictions on land use or on access to legally designated parks and protected areas				
10. Will people lose access to natural resources, communal facilities and services?		√		
11. If land use is changed, will it have an adverse impact on social and economic activities?		√		
12. Will access to land and resources owned communally or by the state be restricted?		√		
Information on Displaced Persons:				
Any estimate of the likely number of persons that will be displaced by the Subproject? [√] No [ ] Yes If yes, approximately how many? _____				

Are any of them poor, female-heads of households, or vulnerable to poverty risks?	**[ ] No [ ] Yes**
Are any displaced persons from indigenous or ethnic minority groups?	**[√] No [ ] Yes**

2. Indigenous Peoples Impact Screening Checklist

KEY CONCERNS (Please provide elaborations on the Remarks column)	**YES**	**NO**	**NOT KNOWN**	**Remarks**
Indigenous Peoples Identification				
1. Are there socio-cultural groups present in or use the subproject area who may be considered as "tribes" (hill tribes, schedules tribes, tribal peoples), "minorities" (ethnic or national minorities), or "indigenous communities" in the subproject area?		√		
2. Are there national or local laws or policies as well as anthropological researches/studies that consider these groups present in or using the subproject area as belonging to "ethnic minorities", scheduled tribes, tribal peoples, national minorities, or cultural communities?				Not Applicable
3. Do such groups self-identify as being part of a distinct social and cultural group?				Not Applicable
4. Do such groups maintain collective attachments to distinct habitats or ancestral territories and/or to the natural resources in these habitats and territories?				Not Applicable
5. Do such groups maintain cultural, economic, social, and political institutions distinct from the dominant society and culture?				Not Applicable
6. Do such groups speak a distinct language or dialect?				Not Applicable
7. Has such groups been historically, socially and economically marginalized, disempowered, excluded, and/or discriminated against?				Not Applicable
8. Are such groups represented as "Indigenous Peoples" or as "ethnic minorities" or "scheduled tribes" or "tribal populations" in any formal decision-making bodies at the national or local levels?				Not Applicable
B. Identification of Potential Impacts				
9. Will the subproject directly or indirectly benefit or target Indigenous Peoples?				Not Applicable
10. Will the subproject directly or indirectly affect Indigenous Peoples' traditional socio-cultural and belief practices? (e.g. child-rearing, health, education, arts, and governance)		√		
11. Will the subproject affect the livelihood systems of Indigenous Peoples? (e.g., food production system, natural resource management, crafts and trade, employment status)		√		

KEY CONCERNS (Please provide elaborations on the Remarks column)	YES	NO	NOT KNOWN	Remarks
12. Will the subproject be in an area (land or territory) occupied, owned, or used by Indigenous Peoples, and/or claimed as ancestral domain?		√		
C. Identification of Special Requirements *Will the subproject activities include:*				
13. Commercial development of the cultural resources and knowledge of Indigenous Peoples?		√		
14. Physical displacement from traditional or customary lands?		√		
15. Commercial development of natural resources (such as minerals, hydrocarbons, forests, water, hunting or fishing grounds) within customary lands under use that would impact the livelihoods or the cultural, ceremonial, spiritual uses that define the identity and community of Indigenous Peoples?		√		
16. Establishing legal recognition of rights to lands and territories that are traditionally owned or customarily used, occupied or claimed by indigenous peoples ?		√		
17. Acquisition of lands that are traditionally owned or customarily used, occupied or claimed by indigenous peoples ?		√		

D. Anticipated subproject impacts on Indigenous Peoples

Subproject component/ activity/ output	Anticipated positive effect	Anticipated negative effect
1.		
2.		
3.		
4.		
5.		

INVOLUNTARY RESETTLEMENT (IR) CATEGORIZATION FORM

A. Instructions

The project team completes and submits this form to the Environment and Social Safeguard Unit (ESSU) for endorsement and for approval by the Chief Compliance Officer (CCO).

The classification of a project is a continuing process. If there is a change in the project components or/and site that may result in category change, the concerned unit must submit a new form and requests for re-categorization, and endorsement by ESSU. The old form is attached for reference.

The project team indicates if the project requires broad community support (BCS) of tribal peoples communities. BCS is required when project activities involve (a) commercial development of the cultural resources and knowledge of indigenous peoples, (b) physical displacement from traditional or customary lands; and (c) commercial development of natural resources within customary lands under use that would impact the livelihoods or the cultural, ceremonial, or spiritual use that define the identity and community of indigenous peoples.

B. Project Data

Borrower: Azure Clean Energy Private Limited	Financing Amount:
Technology: Solar photovoltaic technology using Thin Film Cadmium Telluride (CdTe) PV modules for power generation	Address/Contact: M/s. Azure Clean Energy Pvt. Ltd. 8, LSC, Madangir, Pushp Vihar, New Delhi- 110062 Telephone : 011-49409800 Fax: : 011-49409807

C. Subject

☐ Environment	☒ Involuntary Resettlement	☐ Indigenous People

C. Categorization

☐ New ☐ Re-categorization — Previous Category

☐ Category A	☐ Category B	☒ Category C

D. Basis for Categorization/ Re-categorization (pls. attach documents):

[√] Checklist and Type of Check List: Social Safeguard Screening

[ ] Project and/or Site Description: _____

[ ] Other (e.g., due diligence): _____

E. Comments

Social Team: M. K. MOHANTY	ESSU Comments No private land acquisition for the plant and proposed government land is unused land. Private land required for transmission line will be procured through lease by paying negotiated lease amount to landowners. No involuntary resettlement arises in the project.

F. Approval

Proposed by:	**Endorsed by**:	
Social Team Leader: M. K. Mohanty Date: **Endorsed by**:	Head, ESSU: Khekiho Yeptho Date:	
	Approved by (Optional):	**ADB Concurrence**
Director of Technical Date:	Compliance Officer (if different) Date:	

SOCIAL CATEGORIZATION FORM

A. Instructions

The project team completes and submits this form to the Environment and Social Safeguard Unit (ESSU) for endorsement and for approval by the Chief Compliance Officer (CCO).

The classification of a project is a continuing process. If there is a change in the project components or/and site that may result in category change, the concerned unit must submit a new form and requests for re-categorization, and endorsement by ESSU. The old form is attached for reference.

The project team indicates if the project requires broad community support (BCS) of tribal peoples communities. BCS is required when project activities involve (a) commercial development of the cultural resources and knowledge of indigenous peoples, (b) physical displacement from traditional or customary lands; and (c) commercial development of natural resources within customary lands under use that would impact the livelihoods or the cultural, ceremonial, or spiritual use that define the identity and community of indigenous peoples.

B. Project Data

Borrower: Azure Clean Energy Private Limited	Financing Amount:
Technology: Solar photovoltaic technology using Thin Film Cadmium Telluride (CdTe) PV modules for power generation	Address/Contact: M/s. Clean Energy Pvt. Ltd. 8, LSC, Madangir, Pushp Vihar, New Delhi- 110062 Telephone : 011-49409800 Fax: 011-49409807

C. Subject

☐ Environment	☐ Involuntary Resettlement	☒ Indigenous (Tribal) People

C. Categorization

☒ New ☐ Re-categorization — Previous Category

☐ Category A	☐ Category B	☒ Category C

D. Basis for Categorization/ Re-categorization (pls. attach documents):

[√] Checklist and Type of Check List: Social Safeguard Screening Checklist

[ ] Project and/or Site Description: _____

[ ] Other (e.g., due diligence): _____

E. Comments

Social Team: M. K. MOHANTY	ESSU Comments No impact on indigenous people

F. Approval

Proposed by:	**Endorsed by**:	
Social Team Leader: M. K. Mohanty Date: **Endorsed by**:	Head, ESSU: Khekiho Yeptho Date:	
	Approved by (Optional):	**ADB Concurrence**
Director of Technical Date:	Compliance Officer (if different) Date:	

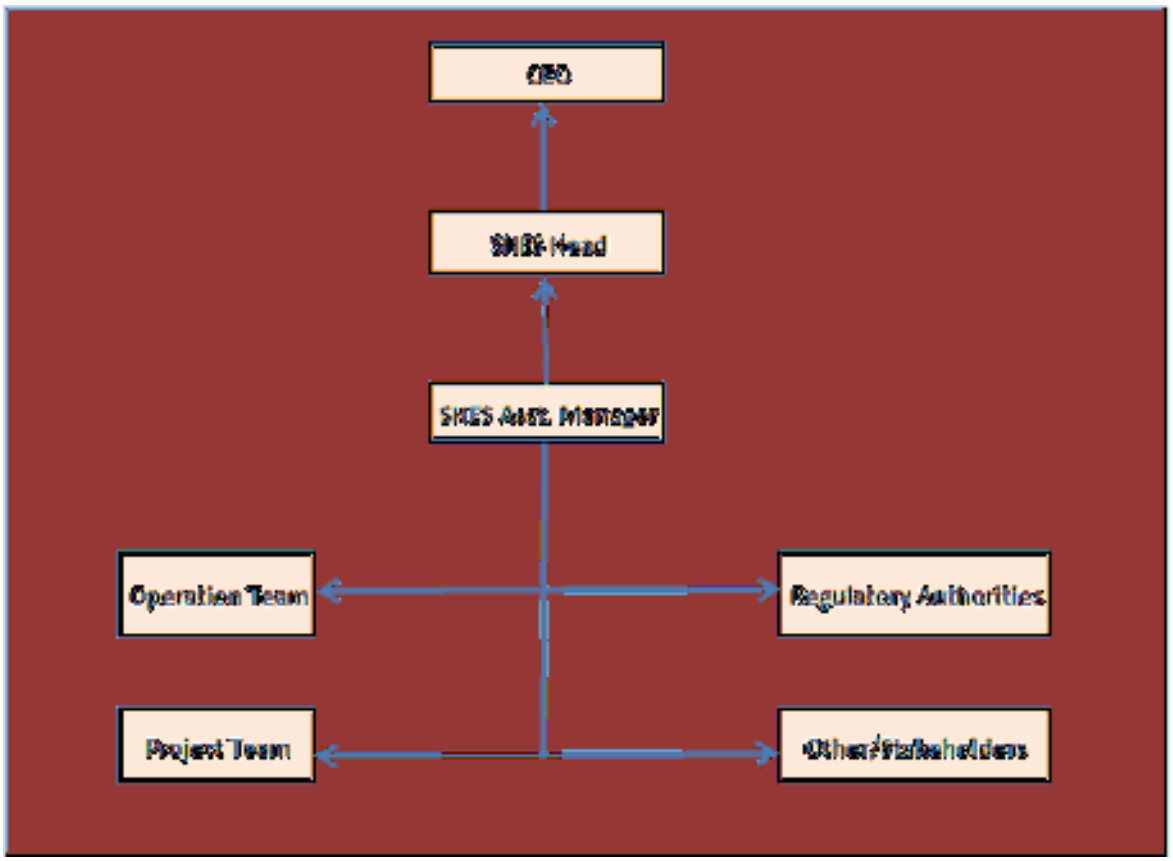
Annexure 11

Developer’s Corporate Organogram

- Co-ordinate with the local communities and the local authorities to identify and implement developmental initiatives;
- Facilitate external reporting to the funding agency; and
- Conduct and facilitate training of the project and operations teams.

The organogram and the internal and external reporting lines of the SEHS Management Team is presented in ***Figure 8-1***.

FIGURE 8-1 ORGANOGRAM OF SEHS MANAGEMENT TEAM



8.4 BUDGET FOR ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN IMPLEMENTATION

The total budgetary allocation is INR 21 lakhs with break up cost provided in **Table 8.3** below. However, the budgetary allocations are indicative of the current assessment and are subjected to revisions while carrying out actual implementation onsite based on the recommendations to be made by RPCB, if any.

Annexure 12

Site Specific Environmental Management Plan, Safety, Health & Environment Plan and Emergency Preparedness Plan prepared by developer for the subproject

Site Specific Environmental Management Plan prepared by developer for the subproject

Environment and Social Management System

Sl.No	Aspects	Potential Impact	Mitigation Measure	Monitoring and Supervision	Responsibility/ Remarks
1	Acquiring of Land	Loss of land, livelihood, assets etc.	The Company shall conduct meaningful consultations with affected people in the issues of land acquisition, or loss of livelihood, if any	Land is taken on Lease (Government Land) During land acquisition process	Land Acquisition team and HRteam
			Compensation for land and any existing assets shall be negotiated on the basis of current government norms		
			Avoid farming season wherever possible for the acquisition		
			Giving priority in jobs to the local people with first priority given to the project affected family		
2	Use of Project Land for storage of material, equipment etc	Impact on water and Soil	The equipments and construction material shall be placed at least 500m away from water bodies (if any), natural flow paths and residential areas	During Construction Phase	Project Execution and SHES Team
			Equipments and materials shall be stored at designated areas with concrete flooring to avoid any spillages which may lead to soil or ground water contamination		
3	Clearing of Land	Soil Erosion	It shall be ensured that the construction activity follows the clearing of land directly to avoid soil erosion	Before Construction	Project Execution and SHES Team
4	Levelling	Soil Erosion	During leveling, gradation across the land shall be reduced by dividing the land in patches having lower gradation	Before Construction	Contractor
		Air Pollution	Water sprinkling shall be practiced	During Construction Phase	Contractor & SHES Team
			Construction machinery shall be properly maintained to minimize exhaust emissions of CO, SPM and Hydrocarbons		
5	Establishment of Labour Camps	Health Risks	Provision of separate mobile toilet facilities for men and women shall be made	During Construction Phase	SHES & Contractor
			The domestic effluent shall be properly disposed off in soak pits		
			Contractor shall provide garbage bins to all workers' accommodation for dumping wastes regularly in a hygienic manner in the area		
		Chances of Sexually Transmitted Diseases	Awareness programmes to be conducted regularly for workers on AIDS, and other health related issues	During Construction Phase	Medical Representative at Site/ SHES
			Health checkup facilities for employees and contract workers		
		Water Pollution	Separate Mobile Toilet facilities shall be made available for male and female	During Construction	Contractor

Sl.No	Aspects	Potential Impact	Mitigation Measure	Monitoring and Supervision	Responsibility/ Remarks
			workers. The domestic effluent shall be properly disposed off in soak pits	Phase	
		Land Contamination	Basic sanitary facilities shall be provided for the workers staying at the labour camp and at the project site	During Construction Phase	Contractor
			Dustbins shall be provided at the camp by the contractor		
6	Construction Phase	Air Pollution	Activities like digging and filling are to be avoided in conditions of very high wind and covers to be provided for loose construction material at construction site	During Construction Phase	Project Execution and SHES Team
			Construction equipments are to be properly maintained to minimize exhaust emissions	During Construction Phase	Contractor
			Water sprinkling shall be practiced	During Construction Phase	
		Reduction in Water Quality	Culverts are to be constructed along the pits dug to collect wash water	During Construction Phase	SHES and Construction team
7	Movement of Vehicles	Air Pollution	All the vehicles entering the site to be asked to have updated PUC (Pollution under control) certificate	During Construction Phase	Contractor & SHES Team
			Vehicle speed is to be restricted to 15km/hour at site		
			Trucks/dumpers are to be covered by tarpaulin sheets during off site transportation of friable construction materials and spoil		
			Maintenance of vehicles shall be carried out regularly		
			Sprinkling of water shall be practiced at the site		
		Soil Contamination	Proper maintenance of vehicle shall be carried out to avoid any leakage of oil or grease	Shall be Checked before Entering Site	Contractor and Security Team
		Water Contamination	Proper maintenance of vehicle shall be carried out to avoid any leakage of oil or grease	Shall be Checked before Entering Site	Contractor and Security Team
		Safety Risks	Vehicle speed is to be restricted to 15km/hour at site	During Work	Contractor & SHES Team
			Necessary safety trainings shall be provided to the drivers of construction vehicles for speed restrictions and do's and don'ts to be followed during movement of construction vehicles		
8	Excavation	Occupational	Provision of adequate personal protective equipment like safety helmets, face	During Construction	SHES / Contractor

Sl.No	Aspects	Potential Impact	Mitigation Measure	Monitoring and Supervision	Responsibility/ Remarks
	and Drilling	Health Hazards	masks, safety shoes, safety goggles etc. for the safety of workers	Phase	& Construction Team
			Training shall be imparted to workers on occupational safety and technical aspects of job undertaken by them		
		Air Pollution	Water sprinkling at regular intervals during excavation and drilling activities shall be practiced to avoid generation of dust	During Construction Phase	Contractor
		Noise Pollution	Regular maintenance of plant equipment shall be carried out	As and When Required	Contractor & SHES Team
			Noise prone activities are to be restricted to the extent possible during night time	During Work	
			Personal protective equipments shall be provided for workers performing drilling at site		
9	Use of D.G. Sets	Air Pollution	D.G set to be optimally used with proper orientation and adequate stack height	At Time of Installation	Contractor & SHES Team
			Stack monitoring carried out on regular basis	Annually	
			Proper maintenance of the DG Set carried out on regular basis		
		Noise Pollution	Acoustic enclosures are to be provided with the D.G sets to minimize the noise levels	Installation Period	SHES / Contractor
10	Storage of Diesel	Soil Contamination	A covered area shall be defined for storage of HSD with concrete flooring	Planning Stage	Store in-Charge & SHES
		Safety Risks	The diesel storage area shall not be proximity of the labour camps	During Construction Phase	Security Guard and SHES
			Inflammable substance shall not be allowed at the project site.		
11	Handling of Broken Solar Panels	Land Contamination	Broken or damaged solar panels shall be immediately shifted to a designated area in scrap yard to avoid any type of land contamination. A photograph is to be taken of the broken panel at the site to cater to Insurance settlement claims	Continuous	Site In-Charge and SHES
			The storage area shall be identified and properly barricaded		
		Health Risks	PPE shall be provided to the workers handling the broken solar panels	Continuous	Site In-Charge and SHES
			The workers at site shall be apprised about the potential health risks associated with handling of solar panels		
12	Handling of Wastes	Land Contamination And Water	Waste shall be stored at designated place after segregation on the basis of category (hazardous and non-hazardous)	Continuous	SHES Team and Scrap Committee

Sl.No	Aspects	Potential Impact	Mitigation Measure	Monitoring and Supervision	Responsibility/ Remarks
		Contamination	Disposal of waste shall be conducted as and when required.	During Construction Phase (To follow Waste Management Handling Procedure)	
		Safety Risks	Adequate PPE's shall be identified and provided to the workers at site	Continuous	SHES
13	Operation of Concrete Mixture Machines	Noise Pollution	Noise shielding to be used where practicable and fixed noise sources to be acoustically treated for example with silencers, acoustic louvers and enclosures	At Time of Installation	Technical Team
			Provision of make shift noise barriers near high noise generating equipment to minimize horizontal propagation of noise		
14	Labour Camp Construction	Child Labour	Provision of clause in contractor's agreement that bans child labour and forced labour at project site	During Construction Phase	SHES & HR (As per Procedure for Child Deployment)
			Adequate procedures to avoid or prevent hiring/entry of child labour at the project site		
		Health and Safety Risk	Temporary crèche facility may be provided in case of migrant laborers children residing in the camps to ensure safety	As per Requirement	SHES & HR
		Water Wastage	Emphasis shall be given on optimization of water usage and supply of potable drinking water for labour camps	Weekly during Construction Phase	Contractor
		Pressure on forest produce	Fuel shall be made available to construction workers so as to reduce pressure on forest produce or local fuel wood resources	Weekly during Construction Phase	Contractor
15	SwitchYard Operation	Safety Risks	Regular safety training shall be imparted to employee on electrical safety	Continuous	Technical and SHES Team
			Rubber mats to be provided near all high voltage areas	At Time of Installation	
			Cardiopulmonary resuscitation (CPR) charts to be displayed in the switchyard area		
		Soil Contamination	Regular maintenance and monitoring of the transformers shall be carried out to avoid leakage of transformer oil	During O&M Phase	
16	Local Community	Grievances	All local issues will be handled locally from Site and their records will be kept in Register.	Entire Lifecycle	SHES/Admin Team (As per Grievance Handling Mechanism

Sl.No	Aspects	Potential Impact	Mitigation Measure	Monitoring and Supervision	Responsibility/ Remarks
					Procedure)
17	Cultural Heritage	Destruction of Cultural Heritage	For any cultural heritage, pass way will be kept open if the pass way is from project site and all care will be taken to ensure the same.	During land acquisition process	Project Execution and SHES Team

Emergency Preparedness Plan prepared by developer for the subproject

On Site Emergency Preparedness Response Procedure

DOC. NO: EHS - EPR

Prepared By:

Anubhav Ranjan
A.M. – SHES

Approved By:

Dr. Manoj Misra
Head Corporate - SHES

AZURE CLEAN ENERGY PRIVATE LIMITED, BAORI, JODHPUR, RAJASTHAN

1.0 PURPOSE

This plan outlines a series of emergency actions that will be executed by the Azure to ensure preparedness and response to emergency situations throughout the life-cycle of the project so that the loss of life and damage to the properties & natural resources are minimized.

2.0 DEFINITION

Emergency - Any unplanned situation, which presents a threat to the safety of workers and/or damage to the properties and other natural resources deemed valuable at the project site

3.0 PROCESS OWNER

Project / O&M AND SHES Team

4.0 EMERGENCIES

The emergency situations that are probable to occur at the solar power site and the probable causes are listed below:

- Fire resulting from electrical short circuit at the plant and equipment during both construction & operation phase.
- Outbreak of endemic disease among construction workers due to contaminated drinking water, unhygienic conditions that have developed at workplace etc;
- Protests by the local community or other stakeholders at any point of the project lifecycle due to conflict with project activities;
- Flood and earthquake in the region; and
- Serious injury or death of employee or sub-contracted worker at work, due to non-work related illness or work-related accident.

5.0 EMERGENCY MANAGEMENT

The following steps shall be taken to ensure proper management of emergency or crisis situations:

- An Emergency Management team of 2-3 professionals from Azure during operation phase of the proposed Solar PV Power Plant; shall be formed to combat any emergency situation arising at site and ensure safety of the life and property at site. The group will be headed by SHE head/ emergency coordinator.
- An emergency communication system will be prepared and informed to all concerned. The nearest civil hospitals, private health care centers or practitioner clinic shall be identified and a agreements shall be made with the aforesaid medical centers/practitioners to provide prompt health care services (including ambulance services) in the event of an emergency situation at site.
- A list of important telephone numbers such as fire brigade, health care facility/practitioner, police station, EHS and Social Coordinator, project office, head offices etc. shall be displayed at all the prime locations at site

- Regular liaising with the police, Gram Panchayat, district administration shall be carried out to ensure that prompt assistance is readily available in the event of an emergency.

- Azure has a grievance redressal mechanism already incorporated in the Azure SHES-MS plan and procedures to deal with village level issues/concerns at preliminary stage to prevent fall out of any major emergencies.

- Emergency Response Team (ERT) to be trained on Emergency scenarios and their management measures including their roles and responsibilities in case of an emergency situation.

- Emergency evacuation plan to be developed and keep for ready reference

6.0 EMERGENCY TEAM

In case of emergency, following team will be active to handle the emergency situation on project site. Also, communication line which is proposed here will be followed during emergency. Every workers and contractors has been made aware about the emergency team and communication line. Further, emergency contact number has also been made available at the site.

Primary Contact person on contractor side – 9825228030 Venu Bhai (Monarch), 9814081626 Pawan (Pacific), 09662082843 Himanshu (Schneider)

Primary Contact person from Azure (on project site) – 09549052959 (Shravan Kumar)

Site In-charge (construction Phase) – 09549052959 (Shravan Kumar During Construction);

EHS Person (at Project Site) – 08107031922 (Satendra Tiwari)

EHS Manger (at Corporate Level) – 09868425907 (Anubhav Ranjan)

Weekly SHE monitoring report prepared by

developer for the subproject

AZURE POWER INDIA PVT. LIMITED										
CAPACITY OF 100 MW SOLAR POWER PROJECT JODHPUR(RAJSTHAN)										
AZURE CLEAN ENERGY 40 MW										
Weekly SHE Monitoring Report (02-04-2015 to 08-04-2015)										
Sr.	**Particulars**						**Qty. in REPORT PERIOD**			**CUMULATIVE**
1.0 ACCIDENT DETAILS	**02-04-2015 to 08-04-2015**						**06-12-2014 to 01-04-2015**			
First aid Incident	NIL						NIL			0
Outside Referral Case	NIL						NIL			0
Loss Time Injury (LTI)	NIL						NIL			0
Near Miss Incidents	NIL						NIL			0
Total Incidents	NIL						NIL			0
Total Man Hrs Worked	11,200						181,262			192,462
Accident rate (FR)	NIL						NIL			0
Days with out LTI till date	7						117			124
Minor/Major	NIL									0
3.0 PROPERTY DAMAGE DETAILS (Without Injury)										
Minor/Major	NIL									0
4.0 NEARMISS INCIDENT (Without Injury)										
Inside/Outside	NIL									0
1.1 ACCIDENT DETAILS										
Type	**Name (Mr./Ms.)**	**Designation**	**Age (Yrs)**	**Roll Emp/ Contractor**	**Date**	**Time**	**Dept**	**Location**	**Injury**	**Body Part**
2.1 FIRE INCIDENT DETAILS										
Type	Description						Date	Time	Dept	Location
	NIL									
3.1 PROPERTY DAMAGE DETAILS (Without Injury)										
	Description						Date	Time	Dept	Location
	NIL									
4.1 NEARMISS INCIDENT (Without Injury)										
	Description						Date	Time	Dept	Location
	NIL									

4.2 FIRST-AID INCIDENT					
	Description	Date	Time	Dept	Location
	NIL				

5.0 Training			
Sr. No. & Date	**Name of Program**	**No. of Prog**	**Participant**
4/7/2015	Material handling and shifting	1	25 Nos
4/8/2015	TBT (before starting the job house keeping is most	1	20 nos

6.0 Daily EHS Observation and Safety Violation Observed						
	Description	**Time (Hrs)**	**contractor**	**Location**	**Reported by**	**Status**
4/2/2015	Poor housekeeping near Inverter Pad no 8		Vijal	40 MW open	Mr. Amresh	open
4/2/2015	Non compliance of safety harness during work at height by an associate		Schenider	40MW Open	Mr. Shravan	Closed
4/7/2015	Non compliance of PPE's (3 Workers are found working near control room)		Pacific	40MW Open	Mr. Amresh	open
	No. of Observations	**Closed Observations**				
	03 nos	**01 nos**				

7.0 Other Activities Like SA 8000 and CSR						
Sr.	**Description**					
	NIL					

8.0 Daily Water Consumption Record			
	Water Consumption for Operational /Cleaning Activities	50000*7=350000 ltr	4,900,000
	Water Consumption for Domestic & Drinking Purpose	28000*7=196000 ltr	1,603,000

9.0 Other Informations										
EHS Legal compliance monitoring	Regular									

10.0 Non-serviceable Fire Extinguishers			
Types of Fire Extinguisher	Quantity	Cause	
	NIL		
	NIL		

11.0 SVT issued			
Name of person	**ID**	**Violation of system**	**Remark**
(SATENDRA TIWARI)			Mr sharwan kumar singh
Prepared BY: SHES Coordinator of the site			**Checked By: Site Head / In charge**

Annexure 13

Photographs showing cleaning of panels in an operational solar project

Photograph showing cleaning of PV panels

Annexure 14

Transmission Line Approval

Government of Rajasthan
Energy Department

No.F.20(21)Energy/2014/Azure Dated: 24/11/2014

NOTIFICATION

M/s Azure Green Tech Pvt. Ltd., is laying 132 KV D/C overhead transmission line with panther conductor of approx. 23.4 kms to connect power evacuated from their 3 projects for 40 MW (M/s Azure Green Tech Pvt. Ltd.), 40 MW (M/s Azure Clean Energy Pvt. Ltd.) and 20 MW (M/s Azure Sun Shine Pvt. Ltd.) Solar Power Projects at Village Hardani & Nadiyan Kalan, Tehsil Boari, District Jodhpur to their common pooling station to be developed at Village Hardani & Nadiyan Kalan, Tehsil Boari, District Jodhpur to 220/132 KV GSS of RVPN at Bhawad, District Jodhpur. The approval of State Government for laying 132 KV D/C overhead transmission line has been issued under Section 68 of the Electricity Act, 2003.

Now the company has requested the State Government to issue notification for right of way in respect of 132 KV D/C overhead transmission line of 23.4 kms to connect power evacuated from their 3 projects for 40 MW (M/s Azure Green Tech Pvt. Ltd.), 40 MW (M/s Azure Clean Energy Pvt. Ltd.) and 20 MW (M/s Azure Sun Shine Pvt. Ltd.) Solar Power Projects at Village Hardani & Nadiyan Kalan, Tehsil Boari, District Jodhpur to their common pooling station to be developed at Village Hardani & Nadiyan Kalan, Tehsil Boari, District Jodhpur to 220/132 KV GSS of RVPN at Bhawad, District Jodhpur. The matter has been considered at the State Government level and in exercise of powers conferred by Section 164 of Electricity Act, 2003 (Central Act No. 36 of 2003), the State Government for the purpose of placing electric lines or electric plants for the transmission of electricity or for the purpose of telephonic or telegraphic communications necessary for the proper coordination of works or for the purpose of construction of 132 KV D/C overhead transmission line of 23.4 kms to connect power evacuated from their 3 projects for 40 MW (M/s Azure Green Tech Pvt. Ltd.), 40 MW (M/s Azure Clean Energy Pvt. Ltd.) and 20 MW (M/s Azure Sun Shine Pvt. Ltd.) Solar Power Projects at Village Hardani & Nadiyan Kalan, Tehsil Boari, District Jodhpur to their common pooling station to be developed at Village Hardani & Nadiyan Kalan, Tehsil Boari, District Jodhpur to 220/132 KV GSS of RVPN at Bhawad, District Jodhpur, is hereby authorized M/s Azure Green Tech Pvt. Ltd., No.8, LSC, Madangir, Pushp Vihar, New Delhi – 110062, subject to the Indian Telegraph Act, 1885 (Central Act 13 of 1885) hereinafter referred to as the said Act. The said lines will pass within the boundary of the following revenue villages:-

SN	Name of village/ kasba in English	Name of village/ kasba in Hindi	Tehsil	Name of District
1	Bhawad	भवाद	Boari	Jodhpur
2	Jabar Singh Ki Dhani	जबर सिंह की ढाणी	Boari	Jodhpur
3	Khari	खारी	Boari	Jodhpur
4	Kailawa Ki Dhani	केलवा की ढाणी	Boari	Jodhpur
5	Kailawa Kalan	केलवा कलां	Boari	Jodhpur
6	Kailawa Khurd	केलवा खुर्द	Boari	Jodhpur
7	Anwana	अनवाना	Boari	Jodhpur
8	Basni	बासनी	Boari	Jodhpur
9	Mangliyon Ki Dhani	मांगलियों की ढाणी	Boari	Jodhpur
10	Dhandhion Ki Dhani	ढांढीयों की ढाणी	Boari	Jodhpur
11	Har Dhani	हरढाणी	Boari	Jodhpur
12	Nandiya Jajira	नांदिया जजीरा	Boari	Jodhpur
13	Nandiya Kalan	नांदिया कलां	Boari	Jodhpur

By order,

Sd/-
(Sanjay Malhotra)
Secretary to Government

Copy to :-
1. CMD RVPN
2. MD RREC
3. Collector Jodhpur
4. Director, Printing & Stationery with the request to please get the notification published in the next Rajasthan Extraordinary Gazette.
5. M/s Azure Green Tech Pvt. Ltd., No.8, LSC, Madangir, Pushp Vihar, New Delhi – 110062
6. Guard File.

Secretary to Government

Annexure 15

Details of Lease Amount

NAVDURGA ELECTROCONSTRUCTION PVT LTD

266-A PASCHIM VIHAR SIRSI ROAD VAISHALI NAGAR JAIPUR

ROW DETAIL PAYMENT OF AZURE POWER LINE

DATE	NAME	BANK	CH NO.	AMOUNT	CASH	TOWER NO.	REMARK
21.03.2015	SEEMA DEVI W/O MOHAN RAM	HDFC BANK	000985	125000	300000	52	
21.03.2015	SWAI SINGH	CASH			300000	53	
21.03.2015	MANOHAR	HDFC BANK	000986	125000	300000	51	
24.03.2015	NATHU SINGH	HDFC BANK	000991	235000	300000	50	
24.03.2015	RANVEER SINGH	INDUSIND BANK	210594	240000		64	
25.03.2015	PINTU KANWAR	INDUSIND BANK	210596	185000	250000	53	
25.03.2015	SHARWAN SINGH	INDUSIND BANK	210597	125000		51-52	
26.03.2015	BALVEER SINGH	INDUSIND BANK	210600	55000		53-54	
06.04.2015	DEVI SINGH	HDFC BANK	001017	60000	30000	23	
15.10.2014	RIDDMAL SINGH	HDFC BANK	000833	110000	195000		FOR THE PANCHYAT AND MANDIR LAND OF KAILAWA
11.12.2014	NIWAS RAM JAT	INDUSIND BANK	500493	150000		LOC NO 36 TO 48	
29.12.14	NIWAS RAM JAT	INDUSIND BANK	811524	150000			
31.12.14	NIWAS RAM JAT	INDUSIND BANK	811528	150000			
17.01.15	NIWAS RAM JAT	INDUSIND BANK	210508	150000			
09.02.15	NIWAS RAM JAT	HDFC BANK	940	440000			
18.02.15	NIWAS RAM JAT	INDUSIND BANK	210545	330000			
13.01.15	SHYAMLA SHARMA	INDUSIND BANK	811567		150000	52-53	
20.02.15	SURESH KUMAR	INDUSIND BANK	210553	150000	100000	68 & 71	
	CHEL SINGH BHATI				1100000	58,65,67,69-70	
	BHERU SINGH	INDUSIND & HDFC VARIOUS CH		4956815		LOC NO 7 - 48 & 54 - 98	
	THROUGH RRVPNL				700000	FROM LOC NO. 1-7	
					200000	FOR LOC. NO. 2	
					70000		
				7736815	3995000		

Navdurga Electroconstruction Pvt. Ltd. JAIPUR

Annexure 16

CSR Plan

Corporate Social Responsibility Plan

DOC. NO: EHS - CSR

Prepared By:

Anubhav Ranjan
A.M. – SHES

Approved By:

Dr. Manoj Misra
Head Corporate – SHES

1.0 PHILOSOPHY

Azure Power strives to meet a variety of stakeholder expectations by implementing Our Core Value of being Socially Responsible. In line with other Legal Requirements and international standards, we implement CSR while listening to what stakeholders say.

2.0 SCOPE

This covers all requirements of stakeholders as identified during Project Execution. Further it also covers the local villages, land owners, investors, Gram Panchayat etc.

3.0 STAKEHOLDER ENGAGEMENT

Stakeholder engagement is an essential part of CSR management. We listen carefully to our customers, suppliers and all other stakeholders, take their feedback seriously and incorporate their input into our internal reform efforts.

Customers	Increase customer value by offering products and services that embody the Azure brand benefits
	Offer affordable and good quality of Power.
Shareholders and investors	Increase corporate value by achieving sustained business growth
	Timely and appropriate information disclosure and communication
Business partners	Build partnerships based on mutual trust and fair trade
	Promote socially responsible activities across the value chain
Society	Contribute to solving social issues through social contributions and business activities
	Respect the cultures and customs of the countries and regions in which we operate, and contribute to their development
Employees	Promote workplace health and safety and develop human resources
	Promote respect for employee diversity and work-life balance

Global environment	Conduct business activities in an environmentally friendly manner and contribute to the reduction of environmental impact
	Contribute to the maintenance and restoration of the Earth's self-recovery capabilities

4.0 PROCESS OWNER

Construction / O&M and SHES Team

5.0 HOW DO WE VIEW CSR AT AZURE POWER

- Azure Power believes in giving back to the community. We constantly work with the communities in different areas for the betterment of the masses.
- Infrastructure development in villages around Azure Power's project sites including street lightning, construction of permanent structures and other developmental activities.
- Azure Power's plants are a source of employment generation for the local community.
- Azure Power recognizes that we have a responsibility beyond our usual business and hence we are making our contribution towards corporate social responsibility.

6.0 ACTION GUIDELINES

- Ensure that all Stakeholders are engaged and their requirements are understood.
- Ensure that all Requirements are given a priority and set-up a long term CSR Plan.
- Ensure that further monitoring are conducted for CSR and their further requirements are understood, analysed and set new targets for CSR.
- We encourage that the CSR Activities start from local area and from the stage of Construction of our Power Plants.

7.0 Needs Identified on the basis of Social Consultation with the Stakeholders

Health:
Facilities in Primary Health Centre are not adequate enough near the Nandiya Kalan and Hardhani viz., vaccination, pregnant women checkup and tests, medical camp etc.

Education:
Primary facilities in primary and middle Govt. School is not satisfactory. Sitting benches in class room are not adequate.

Infrastructure:
Access road to Temple and Crematorium place shall be repaired.

8.0 Based on the above Needs as Identified, the following measures are suggested as a part of Community Development Plan

- Road shall be repaired and proper access shall be given. This will be used jointly with Azure and local Villagers
- Basic Education Amenities (school bags, Note Books, Geometry box etc) shall be given to School Children for their education upliftment.
- Sitting benches should be provided in the nearby school. These benches can be prepared from the wooden material used for solar module packaging and will be considered during Operation and Maintenance Phase.
- Medical Facilities to be planned during Operation and Maintenance Phase if required.

9.0 Monitoring of CSR

Azure always like to monitor their CSR initiative on yearly basis to identify new needs, requirements of stakeholders and continue to do so to have sustainable management.