

Dated: 24-11-2023 File No.: VIS(2023-24)-PL296-246-353

#### LENDER'S INDEPENDENT ENGINEER'S REPORT

OF

#### 3.87 (± 10%) MWp GRID CONNECTED 11 OOF-TOP SOLAR POWER PLANT

PROPOSED TO BE SET-UP AT 11 NOS. OF LOCATIONS IN RAJASTHAN

#### DEVELOPER:

M/S SOLAR QUEST ASHLYN PROJECTS PVT. LTD.

- Corporate Valuers
- Business/ Enterprise/ Equity Valuations
- Lender's Independent Engineers (LIE)

#### REPORT PREPARED FOR

- Techno Economic Viobility Cossulants TBANK OF INDIA, MAKHUPURA BRANCH, AJMER
- ery/ issue or escalation you may please contact Incident Manager Agency for Specialized Account Monitoring (ASM) appreciate your feedback in order to improve our services.
- Project Techno-Financial Advisors
- your feedback on the report within 15 days of its submission after which epora will be considered to be correct.
- Chartered Engineers
- Industry/ Trade Rehabilitation Consultants
- NPA Management
- Panel Valuer & Techno Economic Consultants for PSU

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3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



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3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



PART A REPORT SUMMARY

1.	Name of the Project	3.87 (±10%) MWp Grid Connected 11 Solar Power Plant					
		CattleFeed Plant- Ajmer					
		CattleFeed Plant- Bhilwara					
		CattleFeed Plant-Bikaner					
		Metro Dairy Govindgarh					
		CattleFeed Plant-Jodhpur					
2.	Project Location	CattleFeed Plant- Nadbai					
		CattleFeed Plant- Pali					
		Pollution Control Board Jaipur					
		<ul> <li>5<sup>TH</sup> RAC Battalion Jaipur</li> </ul>					
		Satellite Hospital, Ajmer					
		State Disaster Relief Force					
3.	Seller Company	M/s Solar Quest Ashlyn Projects Private Limited					
4.	Prepared for Organization	State Bank Of India, Makhupura Branch, Ajmer					
_	LIE Consultant Firm	M/s. R.K. Associates Valuers & Techno Engineering					
5.	LIE Consultant Firm	Consultants (P) Ltd					
6.	Date of Survey	23-10-2023 (Cattle Feed Plant- Ajmer & Nadbai only)					
7.	Date of Report	24-11-2023					
8.	Details & documents provided by	Mr. Pranjal Dhariwal, Managing Director M/s Solar Quest Ashlyn Projects Pvt. Ltd.					
9.	Report Type	Lender's Independent Engineering Report					
		Review of Project cost, CUF and Irradiation Data, current					
10.	Purpose of the Report	status to facilitate bankers to take business decision on the					
		Project.					
11	Scope of the Report	To review Project cost and examine the current status of					
	Scope of the Report	installation/ Commissioning of the Project.					
		a. Copy of Power Purchase Agreements (PPAs)					
12.	Documents produced for Perusal	b. Copy of Plant Layout					
		c. Copy of PV Syst reports					
		Benchmark Cost by MNRE					
13.	Annexure with the Report	Market Comparables					
		Global Solar Atlas by World Bank Group					





**PART B** 

#### INTRODUCTION

- NAME OF THE PROJECT: 3.87 (± 10%) MWp Grid Connected Solar Power Plant in RESCO Model to be installed at 11 locations which are described in Part A.2 above by M/s Solar Quest Ashlyn Projects Private Limited.
- PROJECT OVERVIEW: M/s Solar Quest Ashlyn Projects Private Limited (SQAPPL) is an SPV of M/s Solar Quest LLP which is into Manufacturing, supplying, installing and distribution of electric power generation using solar energy.

M/s Solar Quest Ashlyn Projects Private Limited (hereinafter referred to as "Power Producer") had signed 11 nos. of Power Purchase Agreement (PPAs) with different purchaser for Design, Manufacture, Supply, Erection, Testing and Commissioning including Warranty, Operation & Maintenance of 6 roof-top & 5 ground mounted solar power plants at their respective locations having a total DC capacity of 3.87 (± 10%) MWp for 25 years of plant operation/ PPA tenure.

As per details shared by the company, the total project cost is estimated at a price of Rs.17.99 Cr. including duties and taxes.

M/s Solar Quest Ashlyn Projects Private Limited has approached SBI for credit facility to construct these plants who have in turned appointed M/s R.K Associates Valuers & Techno Engineering Consultants Pvt. Ltd. as Lenders Independent Engineer for a specific scope of work.

As per information shared by the company, presently physical work has begun only on Ajmer & Nadbai Site. Thus, we have physically inspected only these 2 locations and more so our scope of work includes only review & comment on total Project cost, CUF and Irradiation Data.

#### **RESCO Model: -**

MNRE had introduced the PPP/RESCO model policy setting tariff rates for solar to be arrived on transparent competitive bidding model through PPP route.

The RESCO model is one of the methods of implementing rooftop solar installations. Under the RESCO model, a renewable energy service company ("RESCO"), (i.e., an energy service company that provides energy to consumers from renewable energy sources), develops, installs, finances, operates and owns the rooftop solar power project ("Project"), and supplies

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#### 3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



power generated from the Project to the consumer on whose premises the Project is set up ("**Customer**") or to the grid through net-metering.

'Build, Own, Operate and Transfer' (BOOT) is a special kind of RESCO model in which the RESCO constructs, owns, operates, and transfers the ownership of the Project to the Customer after the expiry of a predefined period. The RESCO and the Customer enter into a long-term power purchase agreement ("PPA") for an agreed tenure, which sets out, among others, the terms at which the power generated from the Project will be sold to the Customer and the tariff at which the power will be sold. Excess power from the Project (if any) could be sold by the Customer to the distribution utility through net metering system – the net metering regulations differ from state to state.

Under the PPA, the RESCO owns the Project and is responsible for its installation as well as its operation and maintenance of the Project throughout the tenure of the Project, and at the end of the PPA term, the ownership of the Project is transferred to the Customer. Thereafter, the Customer may either choose to retain the RESCO for operation and maintenance services or engage a third-party operator.

If the entity on whose premises the Project is located does not intend to buy the power generated from the Project and does not entered into a PPA with the RESCO, that entity can either lease the rooftop premises to the RESCO by means of a lease agreement or enter into a license agreement granting the RESCO the right to use the premises for the limited purpose of setting up and operating the Project. The RESCO then operates the Project and exports the energy generated to the local distribution utility at a predetermined feed-intariff (FiT) approved by the State Electricity Regulator under relevant schemes issued by the relevant state.

- 3. SCOPE OF THE REPORT: To verify and review the Project cost, CUF and Irradiation Data of the Solar Power Plants set-up/ being set-up by M/s Solar Quest Ashlyn Projects Pvt. Ltd.
  - Industry/ sector research and demand & supply trend is out of scope of the report.
  - Financial feasibility study of the Project is out of scope of the report.
  - Providing any kind of design report or map is out-of-scope of the report.
  - Scrutiny of contracts, Agreements and arrangement between the parties from legal perspective is out-of-scope of this report.
  - Location feasibility is ascertained based on the PVSyst Report provided by the client.
  - Any kind of technical & economic feasibility of the Project is out-of-scope of this Report.

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#### 3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



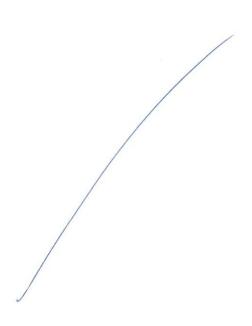
All the assessment carried out for the Project is done based on the documents and information provided to us and various other discussions with the Project proponents and thus forming an opinion out of it.

Component wise verification is not carried out.

4. PURPOSE OF THE REPORT: To provide fair detailed analysis report to the Bank based on the "in-scope points" mentioned above for facilitating them to take appropriate business decision on the Project.

#### 5. METHADOLOGY ADOPTED:

- To gather relevant data/ information/ documents related to Project planning, execution, current status.
- b. Study of copy of Project Planning documents/ Agreements to know the scope of work of the company.
- c. To procure, study and analysis of any additional information, data, and documents required/ provided by the company.
- d. Research about the Project/ sector from the sources in the public domain.
- e. Correlation of the provided information against Industry/ sector benchmarks/ trend.
- f. Information compilation, analysis and reporting.



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#### PART C

#### PROJECT DETAILS AND KEY TECHNICAL PARAMETERS

As per the information and copy of documents shared by the management of the company, details of the subject plants has been tabulated below:

S. No.	Offtaker	Capacity DC Power (kWp)	Capacity AC Power (kWp)	Roof Type
1	Cattle Feed Plant- Ajmer	600	500	Sheet
2	Cattle Feed Plant- Bhilwara	460	450	Ground
3	Cattle Feed Plant-Bikaner	600	400	Ground
4	Metro Dairy Govindgarh	120	100	Ground
5	Cattle Feed Plant-Jodhpur	580	400	Sheet
6	Cattle Feed Plant- Nadbai	600	500	Sheet
7	Cattle Feed Plant- Pali	450	360	Ground
8	Pollution Control Board Jaipur	117	110	RCC
9	5th RAC Battalion Jaipur	100	100	RCC
10	Satellite Hospital, Ajmer	100	80	RCC
11	State Disaster Relief Force	150	150	Ground
	Total	3,877	3,150	

#### Location Maps(for physicially inspected site): -

Out of total 11 nos. of locations, as per information provided physical work at site is in progress at only 2 locations i.e. Cattle Feed Plant, Ajmer & Nadbai. Location Maps of the same is as follows:-



Location: Cattle Feed Plant- Ajmer

GPS: 26°22'35.0"N 74°36'14.0"E

3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT





Location: CattleFeed Plant- Ajmer GPS: 27°12'47.6"N 77°12'41.6"E

#### Technical details as mentioned in proposal

As per copy of proposal shared by the company, the technical details of major component which shall be used for installation of solar plant, are as follows:-

S. No.	Particulars	Rating
1	Solar Panels	
	Credence	650 Wp
	Navitas	540 Wp
	Waaree	540Wp
2	Inverters	
	Sungrow	50 kW- 125 kW
	Growatt	30 KVV- 123 KVV
	Deye	
3	Structures	Al Rails / GI
4	Cables	Polycab
5	Switchgear	Schnider / ABB / Eq
6	Energy Meters	Secure / HPL
7	Earthing	Reputed

The above-mentioned installations/parts are provided as per best industrial practice and can be verified after commissioning of the project.

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3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### PART D

#### **ENERGY YIELD ASSESSMENT**

Company has used PVSyst V7.3.1 to assess energy yield calculation which is the standard Industry practice. The yearly average of main results of irradiation and energy yield from the provided PVSyst is as under:

S. Plant Location		Annual production probability (MWh)		Specific Production (kWh/kWp/year)		Perfor mance Ratio	CUF
No.		P50	P90	As per PPA	As per PVsyst	(%)	(%)
1	Cattle Feed Plant- Ajmer	902.7	834.6	1500	1506	82.93%	17.12%
2	Cattle Feed Plant- Bhilwara	770.3	700.9	1500	1678	82.78%	18.26%
3	Cattle Feed Plant-Bikaner	987.2	912.7	1500	1647	82.76%	18.26%
4	Metro Dairy Govindgarh	197.4	182.5	1500	1654	83.53%	18.26%
5	Cattle Feed Plant-Jodhpur	892.0	811.5	1500	1529	81.77%	18.26%
6	Cattle Feed Plant- Nadbai	839.8	776.4	1500	1401	85.46%	17.12%
7	Cattle Feed Plant- Pali	774.8	704.9	1500	1722	82.75%	18.26%
8	Pollution Control Board Jaipur	189.1	174.8	1500	1621	83.18%	17.12%
9	5th RAC Battalion Jaipur	163.7	151.3	1500	1621	83.17%	17.12%
10	Satellite Hospital, Ajmer	153.2	141.6	1500	1603	80.72%	16.55%
11	State Disaster Relief Force	250.0	231.1	1500	1653	83.20%	17.12%

Analysis of Irridiation & PV Output data: In respect to Irridiation & PV Output data, company has provided to us PVSyst Report V7.3.1 in which key Irrdidation components and PV Output data is given as enumerated in table below. We have analysed and compared it with other data source points also such as Solar Resource by Global Solar Atlas of World Bank and ISRO Solar Calculator to confirm its legitimacy as mentioned in table below:

	Cattle Feed Pla	Cattle Feed Plant- Ajmer		Cattle Feed Plant- Bhilwara		Cattle Feed Plant- Bikaner	
Particulars	As per Global Solar Atlas	As per PVSyst	As per Global Solar Atlas	As per PVSyst	As per Global Solar Atlas	As per PVSyst	
Global horizontal Irradiation (kWh/m²)	1970.1	1846.1	1979.2	1840.9	1937.8	1810.8	
Diffuse horizontal Irradiation (kWh/m²)	850.7	809.9	850.2	809.9	884.5	870.5	
Direct Normal Irradiation (kWh/m²)	1690.8	-	1700.1	-	1592.3	-	
Specific Photovoltaic Power Output	1696.7	1506.0	1700.2	1678.0	1678.2	1647.0	
Annual Global Insolation (ISRO Solar Calculator) (kWh/m2/year)	1676		1707		1641		



#### 3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



	Metro Dairy Go	Metro Dairy Govindgarh		Cattle Feed Plant-Jodhpur		Cattle Feed Plant- Nadbai	
Particulars	As per Global Solar Atlas	As per PVSyst	As per Global Solar Atlas	As per PVSyst	As per Global Solar Atlas	As per PVSyst	
Global horizontal Irradiation (kWh/m²)	1862.9	1802.3	2023.7	1901.1	1808.7	1668.2	
Diffuse horizontal Irradiation (kWh/m²)	923.1	831.8	822.6	832.5	935.8	894.8	
Direct Normal Irradiation (kWh/m²)	1378.8	-	1826.0	_	1290.8	-	
Specific Photovoltaic Power Output	1581.7	1654.0	1747.5	1529.0	1547.7	1401	
Annual Global Insolation (ISRO Solar Calculator) (kWh/m2/year)	1616		1782		1501		

	Cattle Feed Plant- Pali		Pollution Control Board Jaipur		5 <sup>th</sup> RAC Battalion Jaipur	
Particulars	As per Global Solar Atlas	As per PVSyst	As per Global Solar Atlas	As per PVSyst	As per Global Solar Atlas	As per PVSyst
Global horizontal Irradiation (kWh/m²)	2037.0	1892.1	1892.6	1785.5	1892.6	1785.5
Diffuse horizontal Irradiation (kWh/m²)	809.7	821.5	881.8	847.6	881.8	847.6
Direct Normal Irradiation (kWh/m²)	1868.3	-	1524.7	-	1524.7	-
Specific Photovoltaic Power Output	1752.8	1722.0	1638.1	1621.0	1638.1	1621.0
Annual Global Insolation (ISRO Solar Calculator) (kWh/m2/year)	1807		1617		1617	

	Satellite Hospit	al, Ajmer	State Disaster Relief Force		
Particulars	As per Global Solar Atlas	As per PVSyst	As per Global Solar Atlas	As per PVSyst	
Global horizontal Irradiation (kWh/m²)	1970.1	1846.1	1892.6	1804.9	
Diffuse horizontal Irradiation (kWh/m²)	850.7	809.9	881.8	834.0	
Direct Normal Irradiation (kWh/m²)	1690.8	-	1524.7	-	
Specific Photovoltaic Power Output	1696.7	1603.0	1638.1	1653.0	
Annual Global Insolation (ISRO Solar Calculator) (kWh/m2/year)	1676		1617		

#### Observations and Remarks:

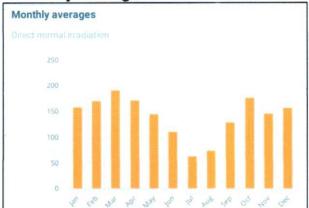
- As per the PVsyst Simulation reports dated 25<sup>th</sup> October 2023, the estimated energy that
  can be produced by the subject plants and their respective performance ratio is almost equal
  as agreed in the PPA.
- 2. As per comparative analysis, PVSyst Irrdiation and PV Output data is in line to our analysis from Global Solar Atlas of World Bank and ISRO Solar Calculator.
- As per the information provided by the management of the company, the estimated average Capacity Utilization Factor (CUF) is about 17.76% for all locations (refer table above for locationwise CUF).
- 4. As per details shared by the company for all projects, the expected Net Energy generation is about 60,43,202 KWh/year (± 5%). However, actual generation would be effected by weather and maintenance of the plant.

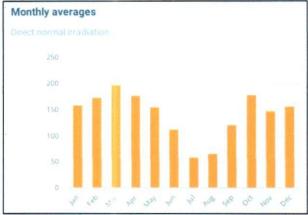
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3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT

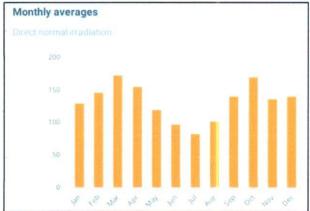


Monthly averages- Direct Normal Irradiation (kWh/m²)

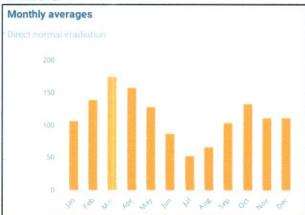




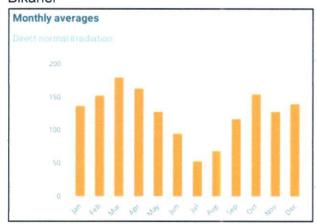
#### Ajmer



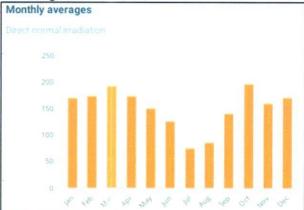
#### Bhilwara



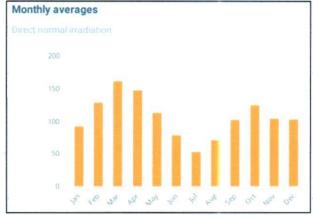
#### Bikaner



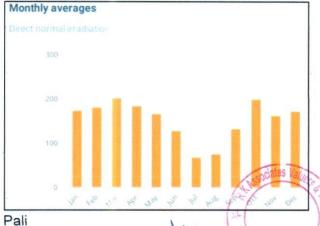
Govindgarh



#### Jaipur



Jodhpur

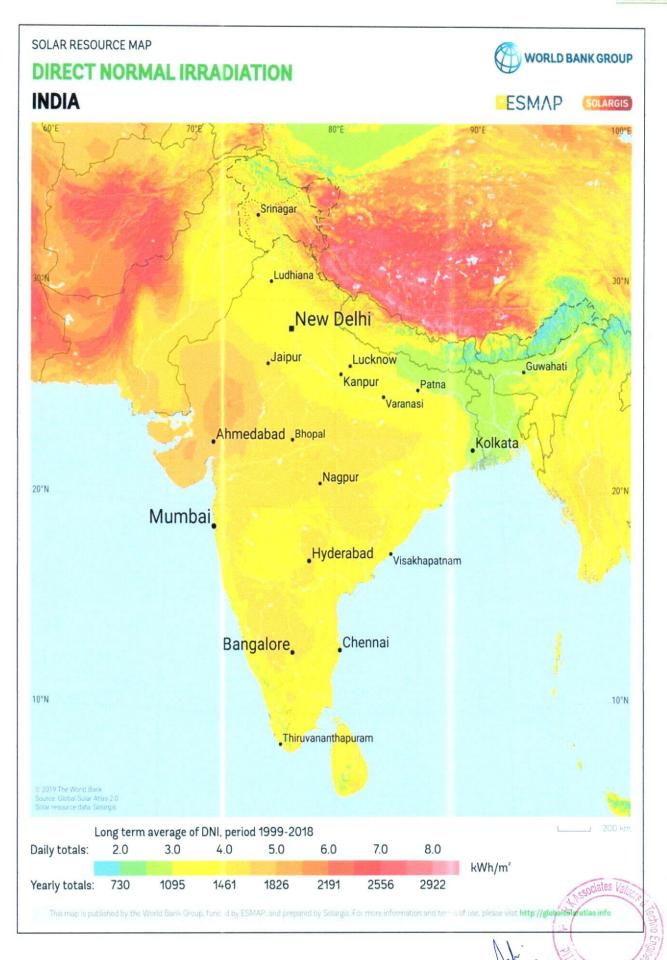


Nadbai

Source: Global Solar Atlas

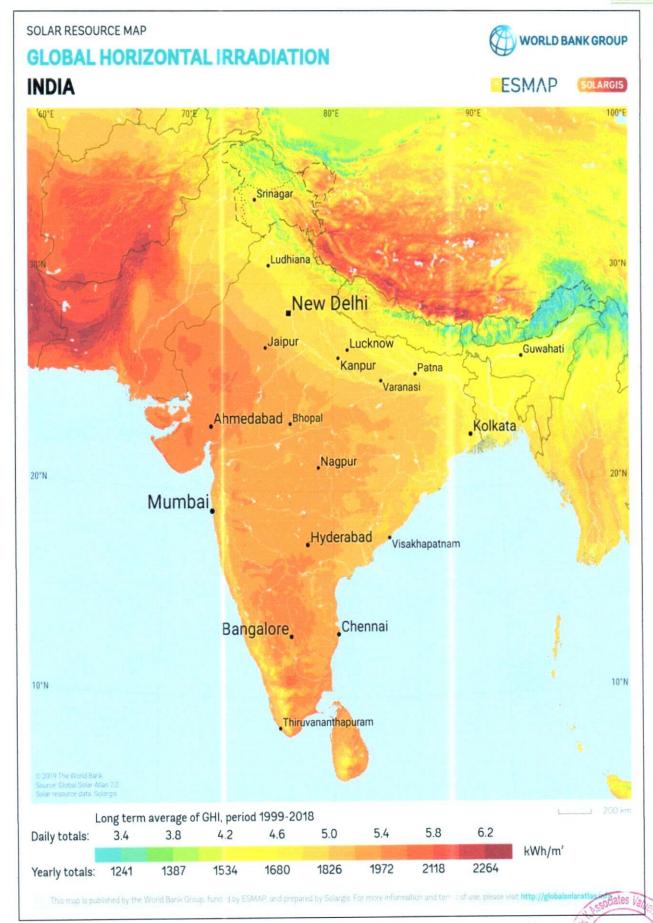
3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT





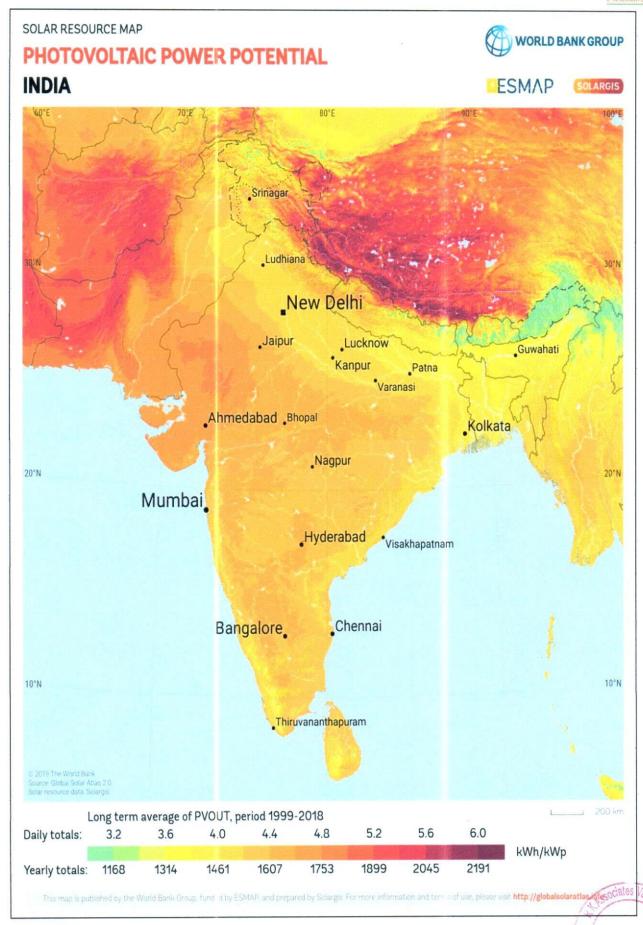
 $3.87 (\pm 10\%)$  MWp GRID CONNECTED SOLAR POWER PLANT





3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT





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3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



PART E

#### **POWER PURCHASE AGREEMENT**

As per the information provided by the company, the total proposed capacity of the solar power plant is 3.87 MWp (± 10%). As on date, company has signed 11 no. of PPAs to install the power plant and supply power at both the project sites. The PPA had been signed between all the 11 parties and Solar Quest Ashlyn Projects Pvt. Ltd. Details of the same are tabulated below:

S. No.	Offtaker	DC Capacity (kWp)	Tariff (Rs./kWh)	PPA Date
1	Cattle Feed Plant- Ajmer	600	4.05	27-09-2022
2	Cattle Feed Plant- Bhilwara	460	4.05	29-09-2022
3	Cattle Feed Plant-Bikaner	600	4.05	29-09-2022
4	Metro Dairy Govindgarh	120	4.05	11-09-2022
5	Cattle Feed Plant-Jodhpur	580	4.05	27-09-2022
6	Cattle Feed Plant- Nadbai	600	4.05	03-11-2022
7	Cattle Feed Plant- Pali	450	4.05	27-09-2022
8	Pollution Control Board Jaipur	117	4.05	25-08-2022
9	5th RAC Battalion Jaipur	100	4.05	20-09-2022
10	Satellite Hospital, Ajmer	100	4.05	07-05-2022
11	State Disaster Relief Force	150	4.05	15-07-2022
	Total	3877		

Source: PPAs





3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### PART F

#### **CURRENT STATUS OF WORK**

As per information shared by the client, the installation of solar plant is in progress at Cattle Feed Plant, Ajmer & Nadbai. Thus, Out of total 11 nos. of projects, we have physically inspected only 2 nos. of locations i.e. Cattle Feed Plant, Ajmer & Nadbai. The current status of project is as follows:-

#### Cattle Feed Plant, Ajmer:

- The physical inspection of site was done on 23-10-2023.
- The project was started in May 2023. The DC capapcity of the plant is 600KW.
- All the material have been supplied at site.
- There are total 923 panels to be installed. Out of the same 770 panels have been installed as on date of site visit.
- As on date of site visit, about 85% of total work was completed.
- The was supposed to completed at the First Week of November 2023.

#### Cattle Feed Plant, Nadbai:

- The physical inspection of site was done on 23-10-2023.
- The project was started in April 2023. The DC capapity of the plant is 600KW.
- As on date of site visit, the 100% of work was completed in June 2023.
- · As as on date of site, the plant was operational.

As per information shared by the company officials, rest of the locations were not inspected from our end, as Solar Plant installation work has not been started yet. We have analysized the plant location area via Google Map. No major shadow or obstruction has been found on roof/ground to block the Direct Sunlight.

Specific Google/ location Map of sites which were not physically inspected, has been attached from Page- No. 42A to 42D after Page No. 42. of this report.



3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



PART G

#### PROJECT COST & EXPENDITURE

1. PROJECT COST: As per details shared by the company, the total project cost for installation of 3.87 MW solar projects in all 11 nos. of location is Rs. 17.99 Cr. Project wise cost break-up shared by the company is as follows:-

S. No	Plant Name	DC Capacity (KWP)	Project Cost (In Rs. Cr.)	Cost (in Rs. Per KW)	
1	Cattel Feed Plant- Ajmer	600	2.17	36,100	
2	Cattel Feed Plant- Bhilwara	460	1.59	34,600	
3	Cattel Feed Plant-Bikaner	600	2.32	38,600	
4	Metro Dairy Govindgarh	120	0.42	34,600	
5	Cattel Feed Plant-Jodhpur	580	1.95	33,650	
6	Cattel Feed Plant- Nadbai	600	2.35	39,150	
7	Cattel Feed Plant- Pali	450	1.71	38,100	
8	Pollution Control Board Jaipur	117	0.49	42,150	
9	5th RAC Battalion Jaipur	100	0.37	36,600	
10	Satellite Hospital, Ajmer	100	0.33	32,600	
11	State Disaster Relief Force	150	0.49	32,600	
	Total	3877	14.18		
	EPC Margin 1.63				
	GST (13.8%) 2.18				
		<b>Grand Total</b>	17.99		

#### Observations and Remarks:

a. Project cost calculated on the basis of the Benchmark Cost provided by the MNRE has been tabulated below:

S. No.	Particulars	Benchmark Cost (In Rs./kW)	Project Capacity (In MW)	Total Project Cost (Excluding GST) (In Rs.)	Total Project Cost (Including ~14% GST) (In Rs.)
1	As per Ministry of New & Renewable Energy	35,886*	3,877	13,91,30,022	15,86,08,225
	0,		3.87 MWp		~Rs. 15.86 Cr.

\*Benchmark cost for 2021-22 Excludes GST



#### $3.87 (\pm 10\%)$ MWp GRID CONNECTED SOLAR POWER PLANT



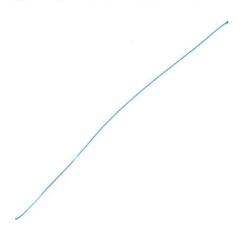
b. Project cost calculated on the basis of market comparable:

S. No.	Particulars	Excluding GST Per KW Cost (In Rs.)	Including GST Per KW Cost (In Rs.)	Remark
1	Subject project installation cost	-	46,402	As per Compnay
	Mar	ket Research Details		
2	MNRE Benchmark Cost	35,886	-	Refer Annexure-1
Marke	et Research			
3	Quotation-1 (250 KW)	37,740	42,500	
4	Quotation-2 (150 KW)	39,037	44,000	
5	Quotation-3 (150 KW)	-	55,000	Refer Annexure-2
6	Quotation-4 (150 KW)	50,000	56,900	The state of the s
7	Quotation-5 (243 KW)	-	46,480	

- c. As per our analysis and market research, the installation cost of Solar Power Plant varies from Rs. 42,500/- per KW to Rs. 56,900/- per KW. For the smaller setups the price is higher and for large set-up, price is less.
- d. The project cost is solely depends upon the project location, contractors profit, type of module and its supporting structures, etc.
- e. Based upon the above mentioned details, the project cost amounting to Rs. 17.99 Cr. inclusive of GST for the installation of subject solar power plant seems to be reasonable.
- f. As per the verbal information received from the management of the subject company, installation work on some location is yet to be started.

#### Note:

- Project cost is analyzed based on lump sum cost only and not item wise.
- Project cost is assessed for the date of this report only and due to price fluctuations it may vary from time to time.
- 2. EXPENDITURE: Details of expenses incurred till date are not shared with us. Thus, we cannot comment upon expenditure incurred till date on the project.



3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### PART H

#### **PHOTOGRAPHS**

Cattle Feed Plant, Ajmer:-

















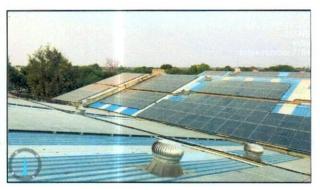


3.87 ( $\pm$  10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### Cattle Feed Plant, Nadbai:-



















3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



PARTI

#### OTHER DOCUMENTS & REFERENCES

#### Annexure-1: Benchmark Cost by MNRE:

No. 32/24/2020-SPV Division Government of India Ministry of New & Renewable Energy

> Block No. 14, CGO Complex, Lodhi Road, New Delhi, Dated 27th October 2021

#### ORDER

Subject: Amendment in Benchmark costs for Grid-connected Rooftop Solar PV systems for the financial year 2021-22 -reg.

Vide Order no.318/38/2018-GCRT dated 18.08.2021 dated 18.08.2021, benchmark costs including taxes, were issued for FY 2021-22 by the Ministry. Subsequently, applicable Goods & Services Tax (GST) rates have been revised by GST Council for identified renewable energy equipment. In order to address the recent changes in GST rates and also any further changes in GST rates in future, it has been decided to issue benchmark costs excluding GST. For the purpose of calculating CFA available under MNRE Scheme, applicable GST rates may be added to these benchmark costs. Accordingly, undersigned is directed to convey the approval of competent authority for issuing the benchmark costs, excluding GST, for Grid-connected Rooftop Solar PV systems applicable for MNRE Scheme for the year 2021-22. Rooftop solar system capacity-wise benchmark costs are given below:

#### (A) For General Category States/ UTs:

RTS System Capacity range		> 1 kW upto 2 kW		> 3kW upto 10 kW	>10 kW upto 100 kW	>100 kW upto 500 kW
Benchmark cost (Rs./kW) excluding GST	46923	43140	42020	40991	38236	35886



3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### **Market Comparables:**

#### Annexure-2

S. No.	Description	On Tin Roof
1.	Turnkey EPC prices for Design, Supply, Erection, Testing & Commissioning of 250 KW Solar Power Generating System	94,35,000
2.	GST	11,90,000
	Total (GST Included)	1,06,25,000 /-

Discom Legal & Liasioning Fees included above.

S. No.	Description	On Tin Roof
1.	Turnkey EPC prices for Design, Supply, Erection, Testing & Commissioning of 150 KW Solar Power Generating System	58,55,520
2.	GST On Project	7,44,480
	Total (GST Included)	66,00,000 /-

#### **TATA POWER SOLAR**



#### 3. Commercial Offer:

3.1 Price for design, supply, installation, testing and commissioning

Commercial Proposal for Design, Engineering, Supply, Transportation, Installation, Testing & Commissioning of various Solar Rooftop Power Plants as per bill of material above:

Commercials for 150 KWp Solar Rooftop Project				
Description	Total			
Basic Project Cost for Design, Supply, Installation, Transportation, Testing and Commissioning of equipment for 150 KWp Rooftop Solar Power Plant	55,000/- Rs.			
Total Project Cost for Design, Supply, Installation, Transportation, Testing and Commissioning of equipment for 150 kWp Rooftop Solar Power Plant (Including GST of the Project Cost)	82,50,000/- Rs.			

#### Note:

- Discom legal Charges will be extra as per actual.
- Cleaning Pipes if required by customer will be charged extra.
- 3.2 General Terms & Conditions



3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



Sno.	Description	CODE	RATE	QTY	Amount	TAX RATE	Tax	Total
1.	SOLAR POWER PLANT (ITEMS)	85414090	52,50,000.00	150 KW	52,50,000	12%	6,30,000	58,80,000
2.	SOLAR POWER PLANT (ERECTION AND COMMISSIONING)	995441	22,50,000.00		22,50,000	18%	4,05,000	26,55,000
					75,00,000		10,35,000	85,35,000

SR. NO.	PARTICULARS	RATE
1	COMPLETE EPC OF 243 KW SOLAR PV POWER PLANT	89,42,400 /-
2	TOTAL COST OF 70% UP 12% GST IS INCLUDE. AND THE REST 30% UP 18% GST IS INCLUDE	12,34,051/-
3 E1	METER & CONNECTIVITY CHARGE - SOLAR GENERATION METER, BI- DIRECTIONAL METER, CT-PT COST, MODERN & MCB COST IF EXTRA DEMANDED BY DISCOMS	INCLUDED  IDLESS SOLUTION
4	TOTAL PAYABLE (W/O STRUCTURE)	1,01,76,451/-
5	FEBRICATION (WITH SUPPORT)	9,47,700+1,70,586(GST)= 11,18,286/-
6	TOTAL FINAL COST	1,12,94,737/-





3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### Data by Global Solar Atlas by World Bank Group

#### 1. Ajmer

#### **GLOBAL SOLAR ATLAS**

BY WORLD BANK GROUP

#### Ajmer

26.4691°, 074.639° unnamed road, Ajmer, Rajasthan, India Time zone: UTC+05:30, Asia/Kolkata [IST]

Report generated: 28 Nov 2023

#### SITE INFO Map data Per year Map PVOUT Specific photovoltaic 1696.7 power output 1690.8 DNI Direct normal irradiation Global horizontal 1970.1 irradiation Diffuse horizontal DIF 850.7 irradiation Global tilted irradiation at GTI opta 2181.8 optimum angle Optimum tilt of PV modules OPTA 29 / 180 Air temperature TEMP Terrain elevation FLE 479 **PVOUT** map Horizon and sunpath Solar azimuth [\*] Solar elevation [\*] -- IST (UTC+05:30) Terrain horizon Active area · · Solar time -- December solstice --- Equinox

3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### **GLOBAL SOLAR ATLAS**

BY WORLD BANK GROUP



3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### 2. Bhilwara

#### **GLOBAL SOLAR ATLAS**

BY WORLD BANK GROUP

#### Rajasthan

25.5°, 074.75° Rajasthan, India Time zone: UTC+05:30, Asia/Kolkata [IST]

Report generated: 28 Nov 2023

#### SITE INFO Per year Мар Map data Specific photovoltaic **PVOUT** 1700.2 KAN KWG power output specific Direct normal irradiation DNI 1700.1 AVAILED Global horizontal GHI 1979.2 irradiation Diffuse horizontal DIF 850.2 irradiation Global tifted irradiation at GTI opta 2186.9 optimum angle Optimum tilt of PV modules OPTA 28 / 180 TEMP Air temperature 25.7 Terrain elevation ELE 402 **PVOUT** map Horizon and sunpath Solar azimuth [\*] 12 11h Solar elevation [\*] 15h 16h 17h Terrain horizon ---- IST (UTC+05:30) Active area · · Solar time June solstice - December solstice - - Equinox

3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### **GLOBAL SOLAR ATLAS**

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3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT

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#### 3. Bikaner

#### **GLOBAL SOLAR ATLAS**

BY WORLD BANK GROUP

#### Bikaner

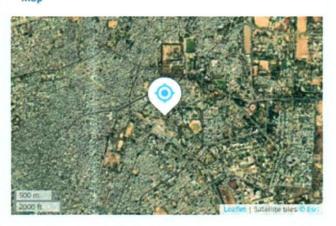
28.015929\*, 073.317137\* unnamed road, 8#kaner, Rajasthan, India Time zone: UTC+05:30, Asia/Kolkata [IST

Report generated: 28 Nov 2023

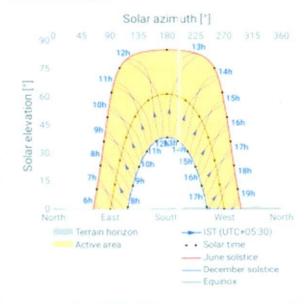
#### SITE INFO

Map data			Per year
Specific photovoltaic power output	PVOUT specific	1678.2	
Direct normal readiation	DNI	1592.3	
Global horizontal irradiation	GHI	1937.8	
Diffuse horizontal irradiation	DIF	884.5	
Global tilted irradiation at optimum angle	GTI opta	2156.6	
Optimum tilt of PV modules	OPTA	29 / 180	
Air temperature	TEMP	27.0	
Terrain elevation	ELE	227	

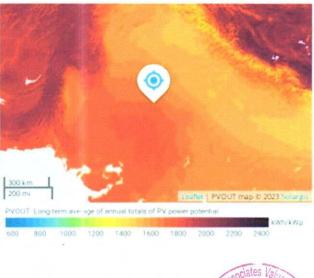
#### Map



#### Horizon and sunpath



#### **PVOUT** map



3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### **GLOBAL SOLAR ATLAS**

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3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### 4. Govindgarh

#### **GLOBAL SOLAR ATLAS**

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#### Govindgarh

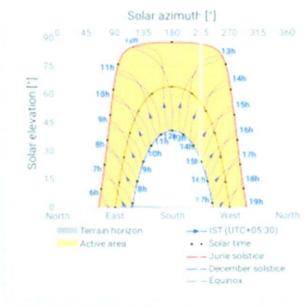
25.652719\*, 078.55116\* Govindgarh, Madhya Pradesh, India Time zone, UTC+05.30, Asia/Kolkata [IST]

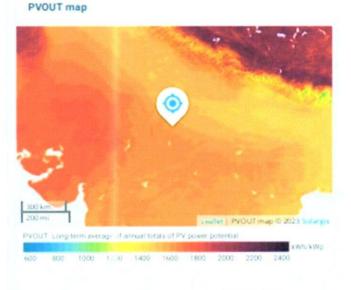
#### Report generated: 28 Nov 2023

#### SITE INFO Per year Map data Specific photovoltaic **PVOUT** 1581.7 power output specific Direct normalirradiation 1378.8 Global horizontal GHI 1862.9 Diffuse horizontal DIF 923.1 Global tilted gradiation at GTI opta 2024.3 optimum angle Optimum tilt of PV modules OPTA 26 / 180 TEMP 25.8 Air temperature ELE 239 Terrain elevation Horizon and sunpath

# SOUGH Satellas Bles City

Map



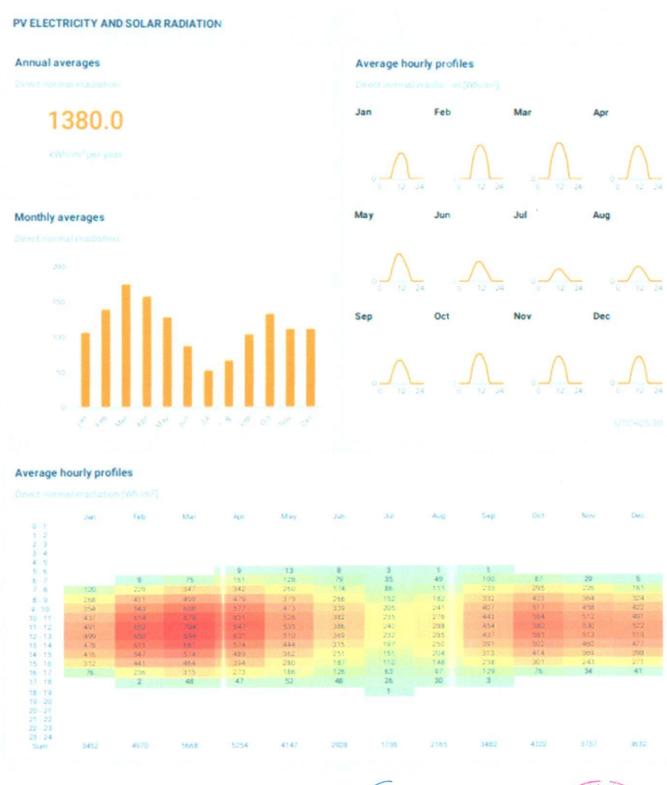


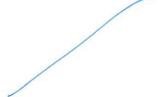
3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### **GLOBAL SOLAR ATLAS**

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3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### 5. Jaipur

#### **GLOBAL SOLAR ATLAS**

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#### Jaipur

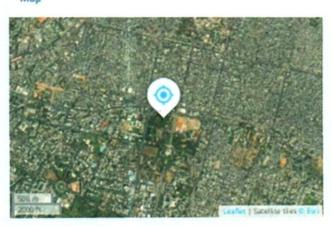
26.915458°, 075.818982° Mirza Ismail Road, Jaipur, Rajasthan, India Time zone: UTC+05:30, Asia/Kolkata [IST]

Report generated: 28 Nov 2023

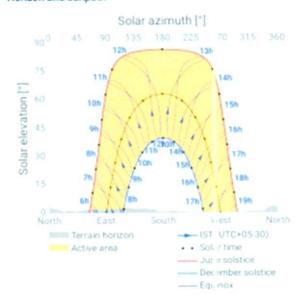
#### SITE INFO

Map data			Per year
Specific photovoltaic power output	PVOUT specific	1638.1	esti veri
Direct normal irradiation	DNI	1524.7	
Global horizontal irradiation	GHI	1892.6	
Diffuse horizontal irradiation	DIF	881.8	
Global titled irradiation at optimum angle	GTI opta	2090.7	
Optimum tilt of PV modules	OPTA	28 / 180	
Air temperature	TEMP	24.9	
Terrain elevation	ELE	442	

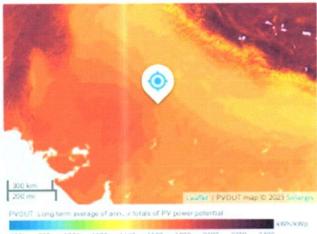
#### Map



#### Horizon and sunpath



#### **PVOUT** map





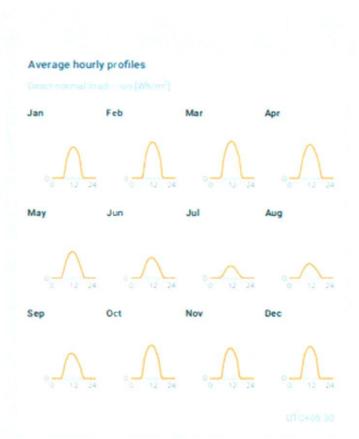
3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



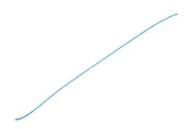
#### **GLOBAL SOLAR ATLAS**

BY WORLD BANK GROUP

# Annual averages Deced normal uradiation 1523.7 Extract per year Monthly averages Direct normal gradiation 250



## 



3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### 6. Jodhpur

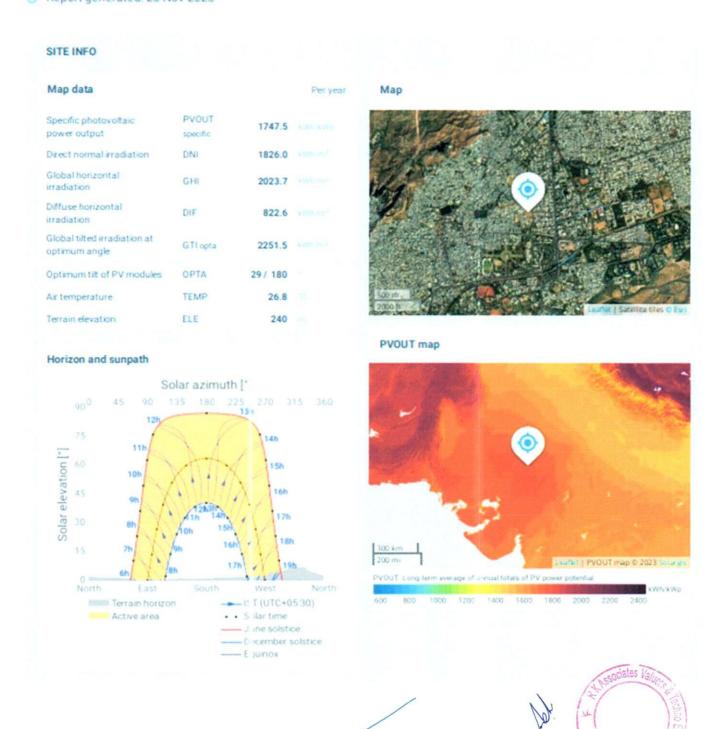
#### **GLOBAL SOLAR ATLAS**

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#### Jodhpur

26.296772°, 073.035143° unnamed road, Jodhpur, Rajasthan, India Tane zone, UTC+05.30, Asia/Kolkata [IST]

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3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### **GLOBAL SOLAR ATLAS**

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#### PV ELECTRICITY AND SOLAR RADIATION Annual averages Average hourly profiles Feb Mar Jan Apr 1825.8 Monthly averages May Jun Jul Aug Oct Sep Nov Dec John Last Jack Last Al . I was the last last last Average hourly profiles 4234 5383



3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### 7. Nadbai

#### **GLOBAL SOLAR ATLAS**

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#### Nadbai

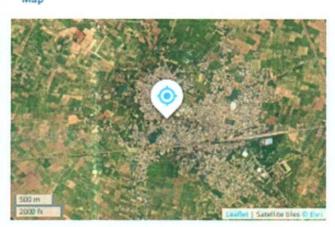
27.215685\*, 077.198245\* unnamed road, Nadbai, Rajasthan, India Tane zone: UTC+05:30, Asia/Kolkata [IST]

Report generated: 28 Nov 2023

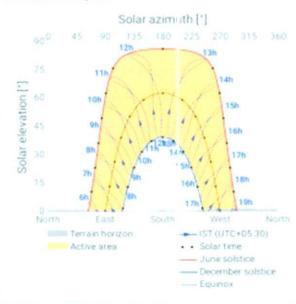
#### SITE INFO

Map data			Peryear
Specific photovoltaic power output	PVOUT specific	1547.7	AVAT AVAID
Direct normal gradiation	in DNI	1290.8	
Global horizontal irradiation	GHI	1808.7	
Diffuse horizontal irradiation	DIF	935.8	
Global tilted irradiation optimum angle	GTI opta	1975.6	
Optimum tilt of PV mor	dules OPTA	27 / 180	
Ar temperature	TEMP	25.4	
Terrain elevation	ELE	203	

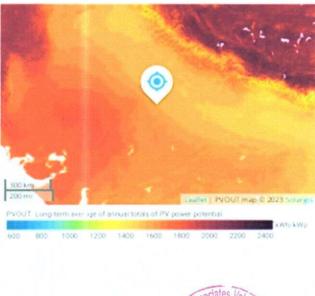
#### Map



#### Horizon and sunpath



**PVOUT** map





3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### **GLOBAL SOLAR ATLAS**

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3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



8. Pali

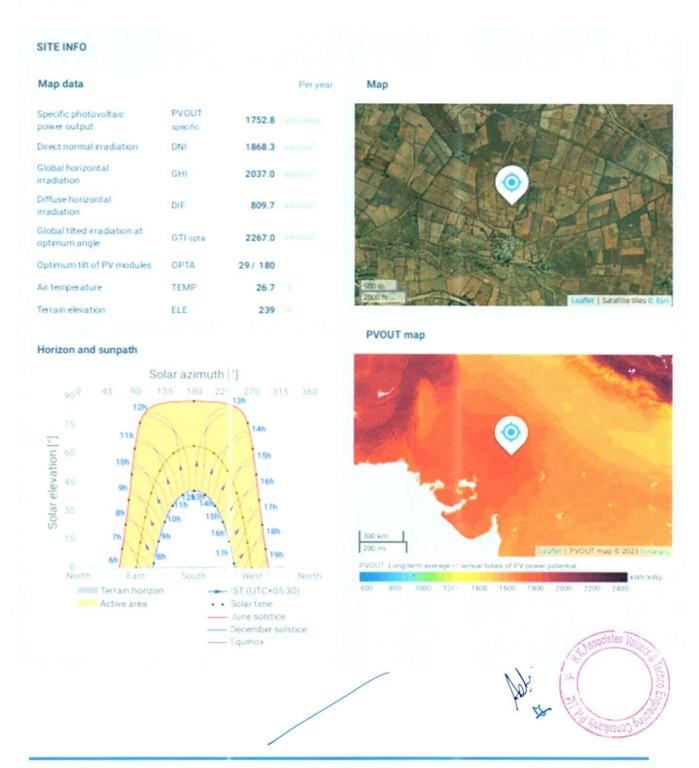
#### **GLOBAL SOLAR ATLAS**

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#### Rajasthan

25.75°, 073.5° unnamed road, Rajasthan, India Time zone, UTC+05:30, Asia/Kolkata [IST]

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3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### **GLOBAL SOLAR ATLAS**

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### **LIE REPORT**3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



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- 2. This report is prepared based on the copies of the documents/ information which the Bank/ Company has provided to us out of the standard checklist of documents sought from them and further based on our assumptions and limiting conditions. All such information provided to us has been relied upon in good faith and we have assumed that it is true and correct in all respect. Verification or cross checking of the documents provided to us has not been done at our end from the originals. If at any time in future, it is found or came to our knowledge that misrepresentation of facts or incomplete or distorted information has been provided to us then this report shall automatically become null & void.
- 3. This report is a general analysis of the project based on the scope mentioned in the report. This is not an Audit report, Design document, DPR or Techno-financial feasibility study. All the information gathered is based on the facts seen on the site during survey, verbal discussion & documentary evidence provided by the client and is believed that information given by the company is true best of their knowledge.
- 4. All observations mentioned in the report is only based on the visual observation and the documents/ data/ information provided by the client. No mechanical/ technical tests, measurements or any design review have been performed or carried out from our side during Project assessment.
- 5. Bank/FII should ONLY take this report as an Advisory document from the Financial/ Chartered Engineering firm and it's specifically advised to the creditor to cross verify the original documents for the facts mentioned in the report which can be availed from the borrowing company directly.
- 6. In case of any default in loans or the credit facility extended to the borrowing company, R.K Associates shall not be held responsible for whatsoever reason may be and any request for seeking any explanation from the employee/s of R.K Associates will not be entertained at any instance or situation.
- 7. This Report is prepared by our competent technical team which includes Engineers and financial experts & analysts.
- 8. This is just an opinion report and doesn't hold any binding on anyone. It is requested from the concerned Financial Institution which is using this report for taking financial decision on the project that they should consider all the different associated relevant & related factors also before taking any business decision based on the content of this report.
- 9. All Pages of the report including annexures are signed and stamped from our office. In case any paper in the report is without stamp & signature then this should not be considered a valid paper issued from this office.

FILE NO.: VIS(2023-24)-PL296-246-353 Page 40 of 42

#### 3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



- 10. Though adequate care has been taken while preparing this report as per its scope, but still we can't rule out typing, human errors, over sightedness of any information or any other mistakes. Therefore, the concerned organization is advised to satisfy themselves that the report is complete & satisfactory in all respect. Intimation regarding any discrepancy shall be brought into our notice immediately. If no intimation is received within 15 (Fifteen) days in writing from the date of issuance of the report, to rectify these timely, then it shall be considered that the report is complete in all respect and has been accepted by the client upto their satisfaction & use and further to which R.K Associates shall not be held responsible in any manner.
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- 12. R.K Associates encourages its customers to give feedback or inform concerns over its services through proper channel at le@rkassociates.org in writing within 30 days of report delivery. After this period no concern/ complaint/ proceedings in connection with the Lender's Independent Engineering Services will be entertained due to possible change in situation and condition of the subject Project.
- 13. Our Data retention policy is of <u>ONE YEAR</u>. After this period, we remove all the concerned records related to the assignment from our repository. No clarification or query can be answered after this period due to unavailability of the data.
- 14. This Lender's Independent Engineering report is governed by our (1) Internal Policies, Processes & Standard Operating Procedures, (2) Information/ Data/ Inputs given to us by the client and (3) Information/ Data/ Facts given to us by our field/ office technical team. Management of R.K Associates never gives acceptance to any unethical or unprofessional practice which may affect fair, correct & impartial assessment and which is against any prevailing law. In case of any indication of any negligence, default, incorrect, misleading, misrepresentation or distortion of facts in the report then it is the responsibility of the user of this report to immediately or at least within the defect liability period bring all such act into notice of R.K Associates management so that corrective measures can be taken instantly.
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FILE NO.: VIS(2023-24)-PL296-246-353

3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### FOR INTERNAL USE

Place:

Noida

SURVEYED BY: Sachin Pandey

Date

24.11.2023

PREPARED BY: Abhinav Chaturvedi

Note

This report contains 42 pages

REVIEWED BY: Sr. V.P. Projects

William State of the State of t

For R.K Associates Valuers & Techno Engineering Consultants (P) Ltd.

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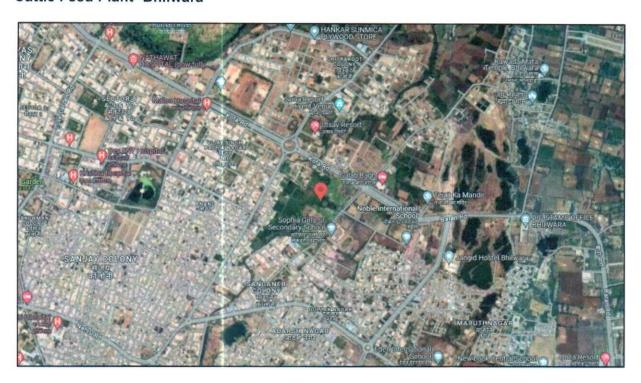
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PART K

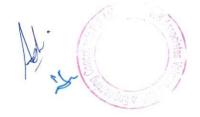
#### GOOGLE/LOCATION MAP OF NOT VISITED SITES

#### Cattle Feed Plant- Bhilwara



#### Cattle Feed Plant- Bikaner





 $3.87 (\pm 10\%)$  MWp GRID CONNECTED SOLAR POWER PLANT



Cattle Feed Plant- Pali



Pollution Control Board- Jaipur



Satellite Hospital- Ajmer



3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT

5th RAC Battalion- Jaipur





#### State Disaster Relief Force-Jaipur





3.87 (± 10%) MWp GRID CONNECTED SOLAR POWER PLANT



#### Metro Dairy- Govindgarh



Cattle Feed Plant- Jodhpur



