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Dated: 25-09-2023

# LENDER'S INDEPENDENT ENGINEER'S REPORT

OF

## 3.9 MWp GRID CONNECTED GROUND- BASED SOLAR POWER PLANT

PROPOSED TO BE SET-UP AT

VILLAGE – AUCHANDI, SUB DISTRICT-NARELA, DISTRICT: NORTH WEST DELHI

SELLER:

M/S TAF SAC SOLAR URJA PRIVATE LIMITED

- Corporate Valuers
- Business/ Enterprise/ Equity Valuations

- Lender's Independent Engineers (LIE)

- Techno Economic Viability Consultants (TEV)

- Agency for Specialized Account Monitoring (ASM)

- Project Techno-Financial Engineers

- Chartered Engineers

- Industry/ Trade Rehabilitation Consultants

- NPA Management

- Panel Valuer & Techno Economic Consultants for PSU  
Banks

REPORT PREPARED FOR

STATE BANK OF INDIA, SME BRANCH, MG ROAD, GURUGRAM

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## PART A

## REPORT SUMMARY

1.	Name of the Project	3.9 MWp Grid Connected Ground-Based Solar Power Plants
2.	Project Location	Village – Auchandi, Sub District-Narela, District: North West Delhi
3.	Seller Company	M/S TALF SAC Solar Urja Private Limited
4.	Prepared for Organization	State Bank of India, SME Branch, MG Road, Gurugram
5.	LIE Consultant Firm	M/s. R.K. Associates Valuers & Techno Engineering Consultants (P) Ltd
6.	Date of Survey	20-09-2023
7.	Date of Report	25-09-2023
8.	Details & documents provided by	Mr. Vikas Jha, from M/S TALF SAC Solar Urja Private Limited
9.	Report Type	Lender's Independent Engineering Report
10.	Purpose of the Report	Verification and Review of Project cost, CUF and Irradiation Data 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 installation/ Commissioning of the Project.
12.	Documents produced for Perusal	a. Copy of Power Purchase Agreements (PPAs) b. Copy of EPC Contract between M/S TALF SAC Solar Urja Private Limited and TALF Solar India Private Limited c. Copy of Plant Layout d. Copy of PV Syst reports
13.	Annexure with the Report	<ul style="list-style-type: none"> <li>Benchmark Cost by MNRE</li> <li>Market Comparables</li> <li>Global Solar Atlas by World Bank Group</li> <li>Layout Plans</li> </ul>



A





**PART B****INTRODUCTION**

- 1. NAME OF THE PROJECT:** 3.9 MWp Grid Connected Ground-Based Solar Power Plant to be installed at aforesaid address by M/s TALF SAC Solar Urja Private Limited.
- 2. PROJECT OVERVIEW:** M/s TALF SAC Solar Urja Private Limited a company incorporated under the laws of India and having its registered office at B-9, 6428, Vasant Kunj, Delhi is proposing to set-up a 3.9 MWp grid connected ground-based solar power plant at Village– Auchandi, Sub District-Narela, District: North West Delhi, on a land area admeasuring 7.32 acres, which is acquired by M/S TALF SAC Solar Urja Private Limited on lease rent for a period of 27 years from farmers.

M/S TALF SAC Solar Urja Private Limited (hereinafter referred to as “Client”) has made and EPC agreement/contract with M/s TALF Solar India Private Limited (hereinafter referred to as “Contractor”) for design, manufacture, supply, erection, testing and commissioning and warranty. The Contractor provides comprehensive solar solutions to government, corporate houses, villages, industries and other consumers.

M/s TALF SAC Solar Urja Private Limited has signed 6 nos. of Power Purchase Agreement (PPAs) with different purchaser for a tenure of 25 years, details of the purchasers can be found in the report further.

M/s TALF SAC Solar Urja 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.

Since, presently no physical work has begun yet on the site and more so our scope of work includes only review of total Project cost, CUF and Irradiation Data. However fencing material and other related materials where stored on site, as observed during site survey.


**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 ground based 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 ground based solar power project ("**Project**"), and supplies 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 the Project cost, expenditures and examine the commissioning, installation status of Solar Power Plants set-up/ being set-up by M/s. TALF SAC Solar Urja 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.

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. METHADODOLOGY ADOPTED:**

- a. 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.



**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.	Particular	Capacity DC Power (kWp)	Capacity AC Power (kWp)	Address
1	Ground Mounted Solar Power Plant- Auchandi	3906	2655	Vacant land at village Auchandi, Sub District-Narela, District: North West Delhi.

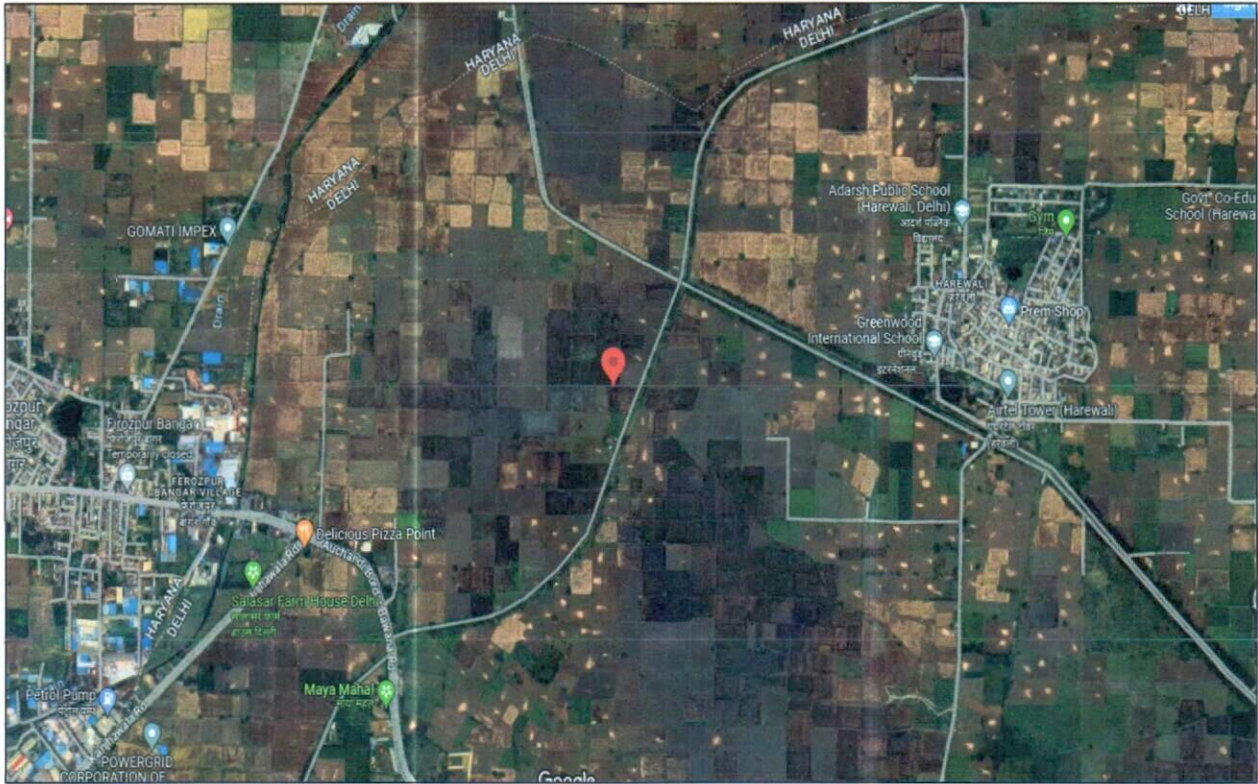
As per the copy of module layout plans of both the sites, Key Technical Parameters & Configuration of the projects like Modules, capacity, etc. are tabulated below:

S. No.	Particular	Figure	UOM
1	Proposed DC Capacity	3906	kWp
2	Total No. of PV Modules Per String	28	No.
3	Proposed AC Capacity	2655	Wp
4	Pitch	6	mtr
5	Module Rating	540	Wp
6	Module Orientation	Portrait	
7	Height of Module Mounting Structure	2.50 meter	
8	Tilt Angle	10°	
9	Total no. Inverters	9 inverters from Sungrow. 295 KW at 50 degree Centigrade	





**Location Map:**



GPS Coordinates:- 28°49'55.1"N 76°59'49.9"E

**Land Layout:**





## Technical Specifications as per data provided by the client:

S. No.	Item Description	Technical Specifications
<b>A</b>	<b>General considerations</b>	
1.	Design Ambient Temp	50 degree
2.	Plant DC Capacity	3906 Wp
3.	Plant AC Capacity	2655 Wp
4.	Module Wp considered	540 Wp
5.	String Configuration	28 no. module per string
<b>B</b>	<b>Structure Design</b>	
1.	Pitch Distance	6 Meter
2.	Module clearance	3000 MM from NGL
3.	Pile Foundation details	2000 MM Depth x 350 MM Dia PCC Piling
<b>C</b>	<b>Roads and Fencing</b>	
1.	Internal Road (Main Road to the Plant)	Gravel road and 200 mm GSB and compaction
2.	Plant Periphery Fencing	Chain Link Fencing using galvanized barbed wire <ul style="list-style-type: none"> <li>Height: 1.5mtr Specs for Chain link fencing</li> <li>Mesh Size: 50mm x 50mm</li> <li>Column Post: 50x50x5 GI.(IS 800/E250)</li> <li>Barbed Wire: 3 rows on top 2.5/2.0mm (IS 278 &amp; IS 280)</li> </ul>
3.	Plant Switch Yard Fencing	Chain Link Fencing using galvanized barbed wire <ul style="list-style-type: none"> <li>Height: 1.5mtr Specs for Chain link fencing</li> <li>Mesh Size: 50mm x 50mm</li> <li>Column Post: 50x50x5 GI.(IS 800/E250)</li> <li>Barbed Wire: 3 rows on top 2.5/2.0mm (IS 278 &amp; IS 280)</li> </ul>
4.	Main Gate for Entrance	Chain Link Fencing using galvanized barbed wire <ul style="list-style-type: none"> <li>Height: 1.5mtr Specs for Chain link fencing</li> <li>Mesh Size: 50mm x 50mm</li> <li>Column Post: 50x50x5 GI.(IS 800/E250)</li> <li>Barbed Wire: 3 rows on top 2.5/2.0mm (IS 278 &amp; IS 280)</li> </ul>
<b>D</b>	<b>DC side - Cables &amp; Accessories</b>	
1.	PV Modules	Longi Solar 540wp Bifacial Modules
2.	Inverters	<ul style="list-style-type: none"> <li>9 inverters from Sungrow.</li> <li>295 KW at 50 degree Centigrade</li> </ul>
3.	PV Connectors	<ul style="list-style-type: none"> <li>MC 4 connector without fuse; Current Rating: 15A / 30A / as per design requirement</li> </ul>
4.	DC Cables (Module to Inverter)	<ul style="list-style-type: none"> <li>Insulation: Electron Beam XLPO</li> <li>Outer Sheath: Electron Beam XLPO</li> <li>Unarmored Cable.</li> </ul>
<b>E</b>	<b>AC side - Cables &amp; Accessories</b>	
1	Inverter Duty Transformers	Type: 2 Winding <ul style="list-style-type: none"> <li>2.7 MVA: Equal to cumulative Inverter kVA (atunity power factor) of block size at 50deg. C</li> <li>MV Rating: 11kV</li> <li>LV Rating: As per Inverter Output Voltage</li> <li>Impedance: As per Inverter Manufacturer's recommendation</li> <li>Cooling: ONAN</li> <li>Connection: LV side – Star Connection, HV side – Delta Connection</li> <li>Winding: Copper</li> <li>Insulation: Class A</li> <li>Flux Density: 1.8 wb/sqm @ 100% voltage</li> <li>Current Density: 3.5 A/sqmm</li> </ul>



**PART D****ENERGY YIELD ASSESSMENT**

Company has used PVSyst v7.2.4 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. No.	Plant Location	Annual production probability (MWh)		Specific Production (kWh/kWp/year)		Performance Ratio (%)
		P50	P90	As per PPA	As per PVSyst	
1.	Ground Mounted Solar Power Plant- Auchandi	6037	5798	Not mentioned	1510	78.44

**Analysis of Irradiation & PV Output data:** In respect to Irradiation & PV Output data, company has provided to us PVSyst report V7.2.4 in which key Irradiation 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 to confirm its legitimacy as mentioned in table below:

Particulars	As per Global Solar Atlas	As per PVSyst
Global horizontal Irradiation (kWh/m <sup>2</sup> )	1743.6	1813.9
Diffuse horizontal Irradiation (kWh/m <sup>2</sup> )	938.2	865.9
Direct Normal Irradiation (kWh/m <sup>2</sup> )	1197.1	---
Specific Photovoltaic Power Output (kWh/kWp)	1496.4	1510
Annual Global Insolation (ISRO Solar Calculator) (kWh/m <sup>2</sup> /year)	1327	

**Observations and Remarks:**

1. As per comparative analysis, PVSyst Irradiation and PV Output data is in line to our analysis from Global Solar Atlas of World Bank.



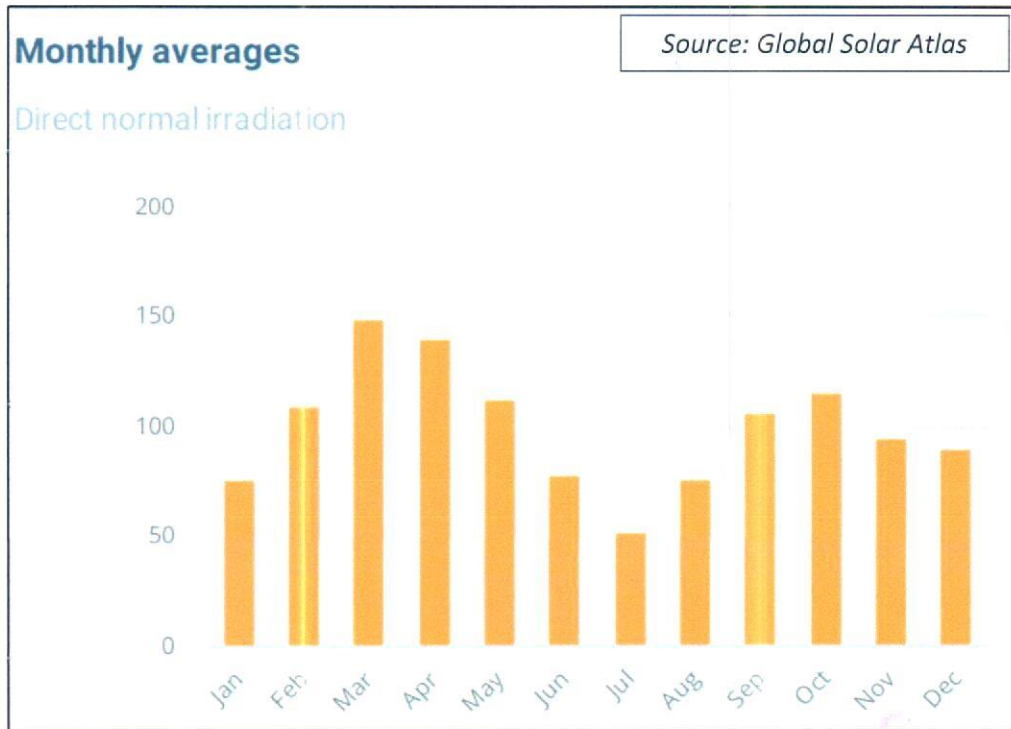

S. No.	Item Description	Technical Specifications
		<ul style="list-style-type: none"> <li>• Tap Changer: OCTC (Off Circuit Tap Changer)</li> <li>• Fault Current Withstand: 2 sec</li> </ul>
2	HT Power Cables	<ul style="list-style-type: none"> <li>• Cross Sectional Area: 185 sq. mm /as per design requirement.</li> <li>• Rated Voltage: 11 kV</li> <li>• Voltage Grade: 0.80 / 11 kV (Earth Grade)</li> <li>• Conductor: Aluminum, 3-Core</li> <li>• Insulation: XLPE</li> <li>• Filler and: As per IS/ OEM</li> <li>• Inner Sheath: PVC ST2 (extruded)</li> <li>• Outer Sheath: PVC ST2</li> <li>• Armoring: GS Flat strip</li> </ul>
3	Communication Cable	<ul style="list-style-type: none"> <li>• RS 485 &amp; CAT 6</li> </ul>
4	Fibre Optic Cables	<ul style="list-style-type: none"> <li>• Single mode Fiber Optic</li> </ul>

**Note:** The above-mentioned installations/parts are provided as per best industrial practice and gathered from the technical specification sheet provided. However it can be verified only after commissioning of the project.





Monthly averages- Direct normal irradiation (kWh/m<sup>2</sup>)



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## SOLAR RESOURCE MAP

## DIRECT NORMAL IRRADIATION

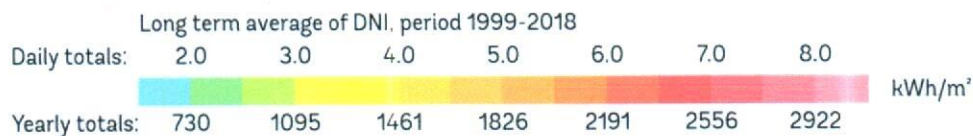
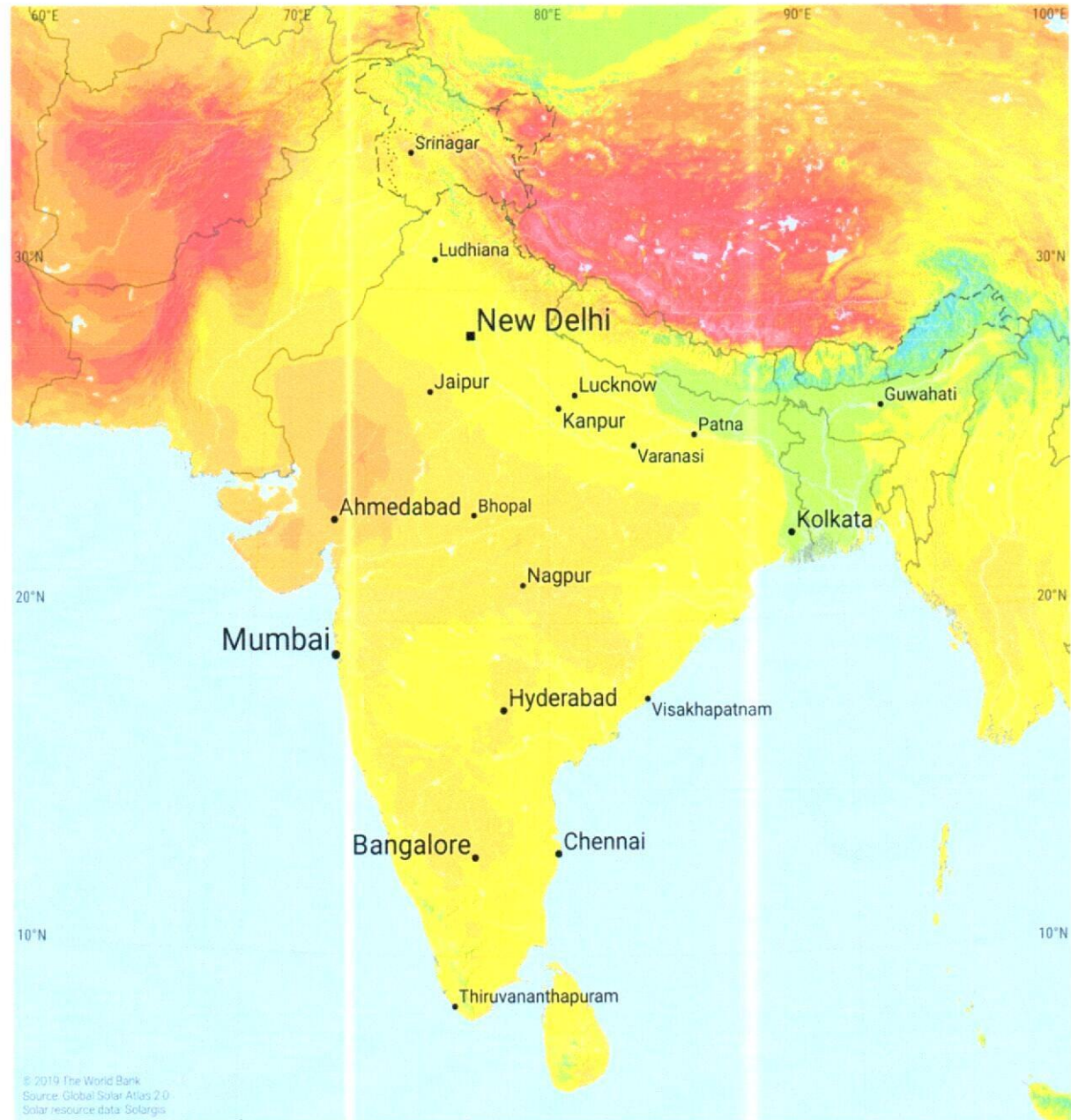
## INDIA



WORLD BANK GROUP

ESMAP

SOLARGIS

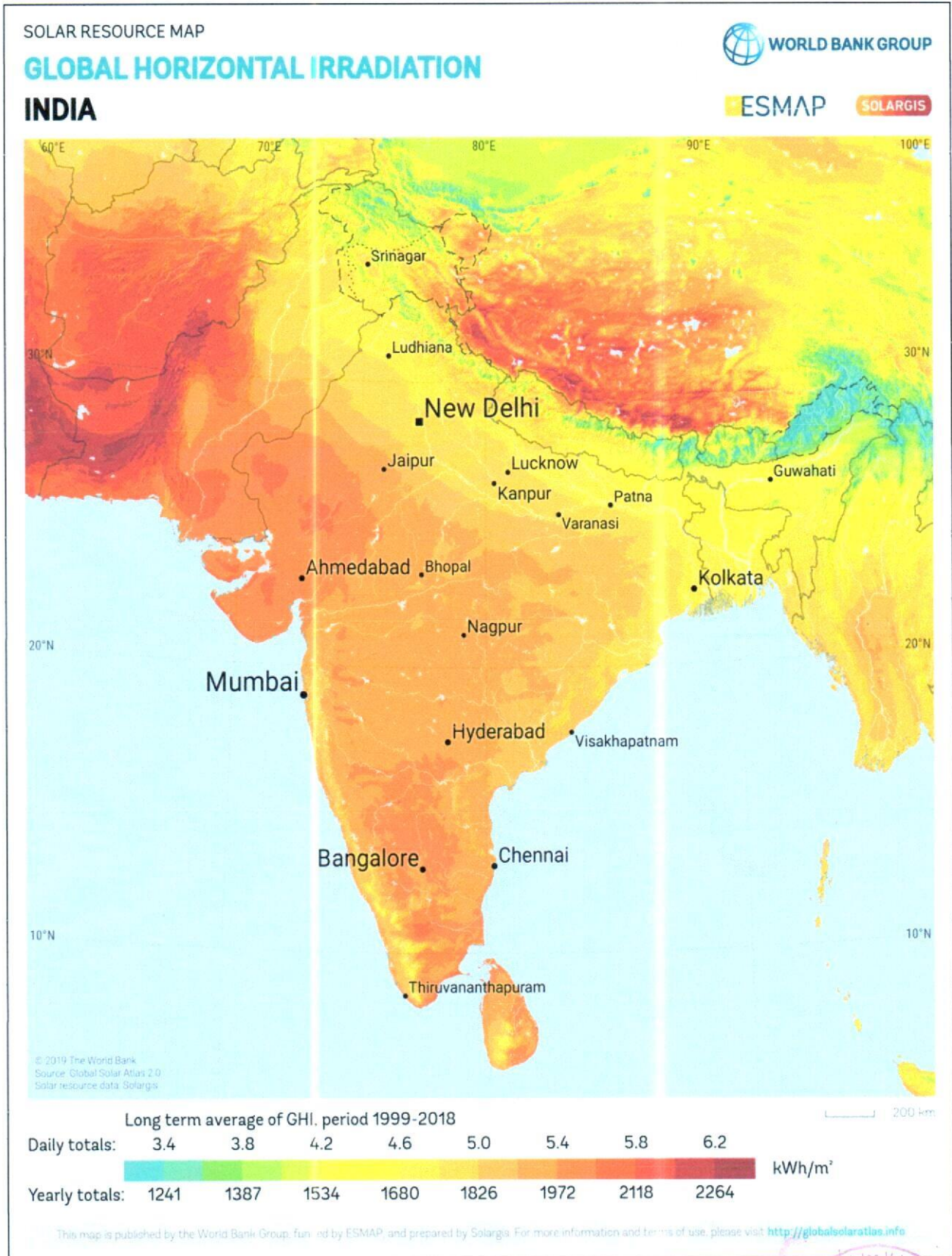


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**Subject Location lies above 3.0 daily (1095 annually) Kwh/m<sup>2</sup>.**







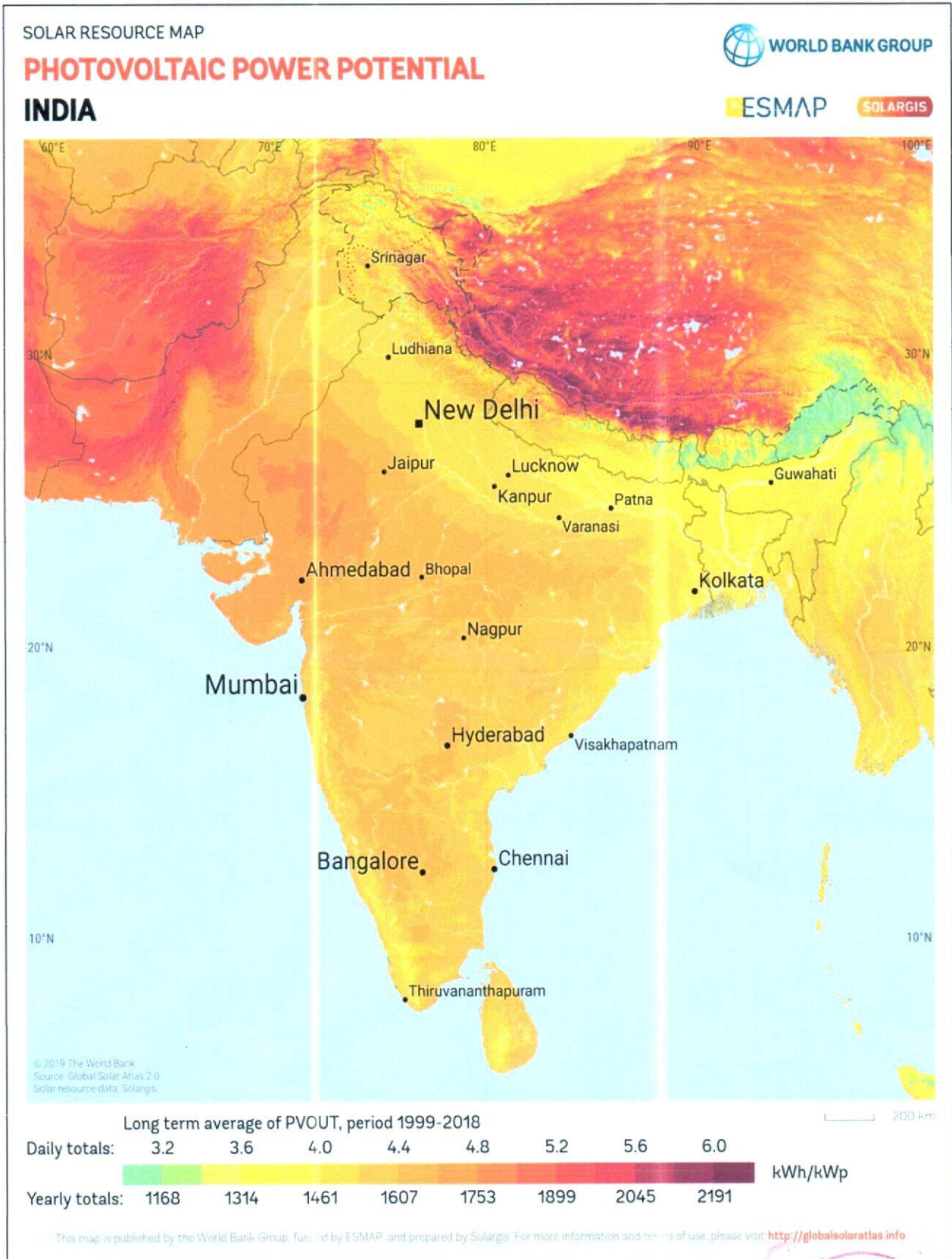
**Subject Location lies above 5.0 daily (1826 annually) Kwh/m<sup>2</sup>.**

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**Subject Location lies above 4.0 daily (1461 annually) Kwh/kWp.**

*[Signature]*





**PART E**

**POWER PURCHASE AGREEMENT TERMS**

As per copy of PPA provided by the company, the total proposed capacity of the subject ground based solar power plant is 4,100 kWp ( $\pm 10\%$ ). As on date, company has signed 6 no. of PPAs to supply power for a period of 25 years. Details of the same are tabulated below:

S. No	Power Producer	Power Purchaser	Agreement Date	Proposed Power Supply(KW)	Tariff
1	TALF SAC Solar Urja Pvt. Ltd.	Ashoka Educational and Welfare Society	04/7/2023	350	7.75 RS/KWh
2		Hansraj College, University of Delhi	30/6/2022	1,000	6.00 RS/KWh
3		Hindu College, University of Delhi	20/05/2022	800	6.00 RS/KWh
4		IUA Trust	07/7/2023	250	7.75 RS/KWh
5		Miranda House, University of Delhi	17/05/2022	1,000	6.00 RS/KWh
6		Sri Guru Gobind Singh College of Commerce, University of Delhi	22/11/2022	700	6.00 RS/KWh
Total				4,100	

**Note:-** Please note that, as per the PPAs, the total capacity should have been 4,100 KW<sub>DC</sub>, but based on a generation of generation of 1,450 KWh/KW<sub>DC</sub>/year and key technological improvements, M/S TALF SAC Solar Urja Private Limited has designed the plant at total capacity of 3,906 KW<sub>DC</sub>.

**Important Clauses:** All PPA's are signed for a period of 25 years with fixed tariff as stated above. Some of the important clauses from the signed PPAs are as follows:-

- 1) **Terms:** The term of this Agreement will be for a period of 25 (Twenty Five) years from COD.
- 2) **Access Rights:** The power producer hereby grants the Power Purchaser the right to enter the installed Space for the purposes of observing the solar Power Plant, upon the Power Purchaser submitting a request to the power producer for such a visit at least 5 Business Days ahead of the proposed visit.
- 3) **Lease rights:** Any lease rights associated with the installed space shall remain solely with the Power Producer.
- 4) **CONSTRUCTION AND O&M OF THE SOLAR POWER PLANT**
  - a) **Interconnection:** The power producer shall provide and lay the dedicated electrical cables for transmission of Solar power from the Solar Power Plant up to the Interconnection Point. Transmission or distribution of Solar power beyond this point will be the responsibility of the Distribution Utility.

- b) **Construction Timelines:** The Power Producer shall install, commission and complete the Solar Power Plant and achieve COD within 10 months from the Effective Date.
- c) **Installation Work:** The Power Producer will cause the Project to be designed, manufactured, supplied, engineered, erected, tested and commissioned, operated & maintained and constructed substantially in accordance with this agreement.

**5. Maintenance:**

- a) The power producer shall be responsible for the ongoing maintenance of the solar Power Plant and any spares/ replacements so required.
- b) The power producer shall be responsible for regular cleaning of the solar Power Plant.
- c) The power producer shall be entitled to suspend delivery of Solar Power from the Solar Power Plant for up to 2 days per calendar year for the purpose of major maintenance or repair works. The power Producer must intimate the Power Purchaser of such suspension of supply within 2 Business Days of the end of such suspension, and the Power Purchaser accepts that the Committed Generation for the period in question shall be proportionately reduced.

**6. Billing and payment:****a) Invoicing:**

- i) The power producer may begin invoicing the Power Purchaser for Solar Power prior to COD, if it is technically feasible for the Power Producer to partially commission the Solar Power Plant and begin supplying Solar Power to the Power Purchaser prior to COD, and the Power Purchaser receives credit for such Solar Power from the Distribution Utility.
- ii) There are presently no taxes, duties, or additional charges levied by any government of similar authority for the supply of electricity generated by solar power plants.

- b) **Payments:** The power purchaser shall make payment in favour of the Power Producer in line with an Invoice, by means of electronic fund transfer or vide a cheque in favour of the Power Producer, by the Due Date.

**Note :** The above main clauses of PPA are mentioned only for illustration purpose of the convenience of the lenders to analyze the Project in terms of technicality. However, this shall not be construed as professional opinion on the contract legality which is out of scope of this report.





**PART F****CURRENT STATUS OF WORK**

During our site visit, it was found that the land is currently lying vacant, with no construction or establishment work in progress. However, there is cultivation taking place on the land at present.

Additionally, some sections or materials intended for construction, such as frames, were found stored on the site.

As per the information provided, the date of Commencement of the plant installation work is scheduled/proposed to be 15<sup>th</sup> October 2023 and the scheduled COD is 31<sup>st</sup> March 2024.



A



**PART G****PROJECT COST & EXPENDITURE****1. PROJECT COST:**

M/S TALF SAC Solar Urja Private Limited (hereinafter referred to as 'Client') has signed an EPC contract with TALF Solar India Private Limited ( hereinafter referred to as 'Contractor') for the installation of Ground Based Grid Tie Solar plant. The total EPC Cost for the project inclusive of all taxes is Rs. 21.47 Crores for the installation of Ground Based Grid Tie Solar plant located at Village Auchandi, Sub District-Narela, District: North West Delhi. Project cost is obtained from the data received from client.

The agreement includes design, manufacture, supply, erection, testing and commissioning including warranty for ground mounted solar plant at the above mentioned location.

The details of the contact price as per letter of agreement is shown below:

Item	Rs/Wp(DC) (Base Rate)	GST Rs/Wp(DC)	Rs/Wp(DC) (Total Rate)	Total Project Cost
<b>Solar System Supply and Design and Installation</b> Solar Modules(Pannels) Inverters and DC Supply, MMS, Civil Works, Transport Warehouse, Liaising, PMC, testing and Commissioning.	43.96	6.15	50.11	Rs. 21.47 Cr.

**Observations and Remarks:**

- The total cost of the project as per the information provided to us is Rs. 21.54 Cr.
- Since, presently no physical work has begun on the site so our scope of work includes only review of total Project cost. Validation or assesement of the same is not done in the report, as there were no relevant documents provided for justification of the cost incurred till date, for ex. CA Certificate, etc.







The roles of the contractor is shown below:

Sl. No.	Description	Primary Responsibility
<b>1</b>	<b>ENGINEERING &amp; PREPARATION</b>	
1.1	Project DPR, Implementation Plan	Contractor
1.2	Design Basis Document, Creation of Engineering Drawings, specification, construction drawings	Contractor
<b>2</b>	<b>PROCUREMENT</b>	
2.1	Solar PV modules	Contractor
2.2	Module mounting structures –Fixed Tilt	Contractor
2.3	DC Cables	Contractor
2.4	Inverters & String Combiner Box	Contractor
2.5	Any other procurement (as per site requirement)	Contractor
<b>3</b>	<b>CONSTRUCTION ACTIVITIES</b>	
3.1	Site Preparation (Level ground)	Contractor
3.2	Civil Engineering Works	Contractor
3.3	Electrical Engineering Works	Contractor
3.4	Other Miscellaneous Systems	Contractor
<b>4</b>	<b>PROJECT AND CONSTRUCTION MANAGEMENT</b>	

Sl. No.	Description	Primary Responsibility
4.3	Health Safety & Environment Monitoring	Contractor
4.4	Quality Assurance / Quality Control	Contractor
<b>5</b>	<b>POST CONSTRUCTION ACTIVITIES</b>	
5.1	As built drawings.	Contractor
5.2	Handing over copies of manuals and test report for all project components.	Contractor
<b>6</b>	<b>TESTING AND COMMISSIONING</b>	
6.1	Mechanical completion test	Contractor
6.2	PR acceptance test	Contractor
6.3	Any other testing/ reports required	Contractor



**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/-	3,909	14,02,78,374	15,99,17,346
			<b>3.9 MWp</b>		<b>~Rs. 16.00 Cr</b>

\*Benchmark cost for 2021-22

- 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	-	50,110	As per letter of agreement
<b>Market Research Details</b>				
2	MNRE Benchmark Cost	35,886	-	Refer Annexure-5
<b>Market Research</b>				
3	Quotation-1	48,700	55,400	Refer Annexure-6
4	Quotation-2	37,740	42,500	
5	Quotation-3	45,000	51,200	

- c) As per our analysis and market research, the installation cost of Ground based Mounted Solar Power Plant varies from Rs. 37,740/- per KW to Rs. 55,400/- 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. 19.57 Cr. inclusive of GST for the installation of subject ground based solar power plant seems to be reasonable.
- f) As per observation made during site survey, installation work of solar plant is yet to be started.
- g) As per the information provided to us by the client, the proposed height of the module mounting structure is elevated at 2.5 metres.

**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:** As per information/details shared by the company, the expenditure incurred till date on the project is shown below in tabulated form:

Particulars	Total Expenses (Rs. Lacs)
Advance Lease Rent	9.20
Lease Deposit	9.20
Lease Registration Charges	9.20
Advance + Payment for MMS (Module Mounting Structure)	20.44
<b>Total</b>	<b>23.60</b>

**Note:-** As per information provided to us, no supporting documents have been provided.

A



<b>PART H</b>	<b>PHOTOGRAPHS</b>
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*[Handwritten signature]*

*[Handwritten mark]*





## PART I

## OTHER DOCUMENTS &amp; REFERENCES

## Annexure-1: Lease Deed

**Lease Deed with Possession**

This Lease Deed (hereinafter referred to as the "Lease" or "Lease Deed") is made on 02<sup>nd</sup> day of August 2023 at Delhi.

By and Between

- Shri Jagpal (AADHAR CARD NO. - 7956 7621 2643) s/o Shri J. N. Narayan aged around 49 years R/o House No. 217, Auchandi, North West Delhi, Delhi 110039
- Shri Jagpal Singh (AADHAR CARD NO. - 4078 7792 9097) s/o Shri Jai Narayan aged around 42 years R/o Flat No. 146A, ground floor, pocket - g, h-1, Saransk Apartment, Sector 28, Rohini, North West Delhi, Delhi 110042

Hereinafter referred to as "Lessors" (which expression shall, unless repugnant to or inconsistent with the context, include his/her legal heirs, representatives, successors, executors, administrators and permitted assigns) of the **FIRST PART**

AND

M/s Talf SAC Solar Urja Private Limited (CIN : U29100DL2022PTC093623), a company incorporated under the laws of India and having its registered office at B-9, 6428, VASANT KUNJ, DELHI, India, 110070 (hereinafter called "The Lessee", which expression shall, unless repugnant to or inconsistent with the context, include its legal representatives, administrators, successors and permitted assigns), through Ashish Jain (AADHAR CARD No. 8571 567, 3232), who is authorized to execute this deed vide resolution passed by the Board of Directors of the Lessee in their meeting held on 22/05/2023, of the **SECOND PART**

Both the parties hereinafter individually referred to as the "Party" and collectively as "Parties"

**WHEREAS:**

- The Lessee is a wholly owned subsidiary of Talf Solar India Private Limited (CIN: U74999DL2017PTC314309) and undertakes solar power plants under Net Metering/ Open Access policies of DERC/ Delhi Government and MNRE.
- The Lessee is looking for land to set up a solar plant of 3-5 MW (hereinafter referred to as the

- "Lease Period" shall mean a continuous period of 27 years, commencing from 1<sup>st</sup> August 2023 and expiring on 31<sup>st</sup> July, 2050.
- Creation of Lease**
  - The Lessors hereby jointly lease the Land Parcel for the Lease Period to the Lessee and the Lessee hereby accepts the aforesaid lease on the terms and conditions specified herein for the Lease Period.
  - In the event of any Lessor's death/insolvency, this Lease Deed shall be valid on their successors, legal heirs, administrators, nominees, representatives, assigns and the persons claiming under them in any capacity whatsoever.
- Representations and Warranties**
  - The Lessors represent that they are the only joint and absolute owners of land admeasuring 2.82 Acres of land (i.e. 13 bigha and 11 Biswa), classified as land with full transferable rights under all applicable laws, comprising Khassra No. / Gatta No. as follows

Khassra No.	Bigha	Biswa
120	16/2	3
17	4	16
24/2	2	08
25	2	10
<b>Total</b>	<b>13</b>	<b>11</b>

as per Khatoni no 76/65 1/2 the crop year 2015-2016 situated in the revenue limits of Village Auchandi, Sub-division Narela, Distt. North, Delhi - 110039, which is more particularly described in the schedule-1 attached hereto (hereinafter referred to as "Land Parcel")

  - That the Lessors jointly and severally represent, warrant and agree that:
    - That they hold undivided Land Parcel
    - They hold valid, good, marketable and exclusive title and possession of their respective shares of Land Parcel and have full power and authority to enter into this Lease Deed to grant lease and deliver possession of the Land Parcel to the Lessee
    - They have taken, and will take, all steps necessary to ensure that the Lessee is able to enjoy sole, peaceful possession of the Land Parcel for the entire Lease Period and operate the Project, without any interruption by the Lessors, government authorities

Page 1 of 11

**Lease Deed with Possession**

This Lease Deed (hereinafter referred to as the "Lease Deed") is made on the 3<sup>rd</sup> day of August 2023 at Delhi.

By and Between

- Shri Satyavr Singh (AADHAR CARD NO. - 5237 5913 5324) s/o Shri Balwant Singh aged around 69 years R/o House No. 642, Gaon and Dak khana, Auchandi, North West Delhi, Delhi 110039
- Shri Rajender Singh (AADHAR CARD NO. - 3682 5656 2228) s/o Shri Balwant Singh aged around 71 years R/o House No. 8 A, Main Road, Main Gali, Auchandi, North West Delhi, Delhi 110039
- Shri Ajayab Singh (AADHAR CARD NO. - 7733 7413 8313) s/o Shri Balwant Singh aged around 69 years R/o House No. 8B, Main Road, Main Gali, Auchandi, North West Delhi, Delhi 110039
- Shri Mahender Singh (AADHAR CARD NO. - 6694 0644 1964) s/o Shri Balwant Singh aged around 60 years R/o House No. 8/D, Main bus stand ka pichhe, Auchandi, North West Delhi, Delhi 110039
- Shri Chand Singh (AADHAR CARD NO. - 4126 4013 5737) s/o Shri Balwant Singh aged around 50 years R/o House No. 8, Main Road, Main Gali, Auchandi, North West Delhi, Delhi 110039
- Shri Hariom (AADHAR CARD NO. - 4468 3076 5426) s/o Shri Mahan Kumar aged around 37 years R/o House No. 8 E, Main Road Wadi Gali, Auchandi, North West Delhi, Delhi 110039

Hereinafter referred to as "Lessors" (which expression shall, unless repugnant to or inconsistent with the context, include his/her legal heirs, representatives, successors, executors, administrators and permitted assigns) of the **FIRST PART**

AND

M/s Talf SAC Solar Urja Private Limited (CIN : U29100DL2022PTC093623), a company incorporated under the laws of India and having its registered office at B-9, 6428, VASANT KUNJ, DELHI, India, 110070 (hereinafter called "The Lessee", which expression shall, unless repugnant to or inconsistent with the context, include its legal representatives, administrators, successors and permitted assigns)

and earthquakes; (c) explosion or fires arising from lighting or other causes unrelated to the acts or omissions of the Lessee; (d) acts of war or public disorders, civil disturbances, riots, insurrection, sabotage, epidemics, terrorist acts, or rebellion; and (iv) actions of the government including appropriation, acquisition, or any action affecting the operation of the Project.

- "Girdawari" means the bi-annual crop cultivation report by the Revenue Department
- "Land Parcel" shall mean the land admeasuring 4.5 Acres, classified as land with full transferable rights under all applicable laws, comprising Khassra No. / Gatta No. as per clauses 3(a)
- "Lease Period" shall mean a continuous period of 27 years, commencing from 1<sup>st</sup> August 2023 and expiring on 31<sup>st</sup> July, 2050.
- Creation of Lease**
  - The Lessors hereby jointly lease the Land Parcel for the Lease Period to the Lessee and the Lessee hereby accepts the aforesaid lease on the terms and conditions specified herein for the Lease Period.
  - In the event of any Lessor's death/insolvency, this Lease Deed shall be valid on their successors, legal heirs, administrators, nominees, representatives, assigns and the persons claiming under them in any capacity whatsoever.
- Representations and Warranties**
  - The Lessors jointly and severally represent, warrant and agree that:
    - They are the only joint and absolute owners of land admeasuring 4.5 Acres of land (i.e. 21 bigha and 12 Biswa), classified as land with full transferable rights under all applicable laws, comprising Khassra No. / Gatta No. as follows

Khassra No.	Bigha	Biswa
120	14	4
22	4	16
23	4	16
24/1	2	08
7	4	16
<b>Total</b>	<b>21</b>	<b>12</b>

**Lease Deed with Possession**

This Lease Deed (hereinafter referred to as the "Lease Deed") is made on the 3<sup>rd</sup> day of August 2023 at Delhi.

By and Between

- Shri Satyavr Singh (AADHAR CARD NO. - 5237 5913 5324) s/o Shri Balwant Singh aged around 69 years R/o House No. 642, Gaon and Dak khana, Auchandi, North West Delhi, Delhi 110039
- Shri Rajender Singh (AADHAR CARD NO. - 3682 5656 2228) s/o Shri Balwant Singh aged around 71 years R/o House No. 8 A, Main Road, Main Gali, Auchandi, North West Delhi, Delhi 110039
- Shri Ajayab Singh (AADHAR CARD NO. - 7733 7413 8313) s/o Shri Balwant Singh aged around 69 years R/o House No. 8B, Main Road, Main Gali, Auchandi, North West Delhi, Delhi 110039
- Shri Mahender Singh (AADHAR CARD NO. - 6694 0644 1964) s/o Shri Balwant Singh aged around 60 years R/o House No. 8/D, Main bus stand ka pichhe, Auchandi, North West Delhi, Delhi 110039
- Shri Chand Singh (AADHAR CARD NO. - 4126 4013 5737) s/o Shri Balwant Singh aged around 50 years R/o House No. 8, Main Road, Main Gali, Auchandi, North West Delhi, Delhi 110039
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Hereinafter referred to as "Lessors" (which expression shall, unless repugnant to or inconsistent with the context, include his/her legal heirs, representatives, successors, executors, administrators and permitted assigns) of the **FIRST PART**

AND


M/s Talf SAC Solar Urja Private Limited (CIN : U29100DL2022PTC093623), a company incorporated under the laws of India and having its registered office at B-9, 6428, VASANT KUNJ, DELHI, India, 110070 (hereinafter called "The Lessee", which expression shall, unless repugnant to or inconsistent with the context, include its legal representatives, administrators, successors and permitted assigns)

and earthquakes; (c) explosion or fires arising from lighting or other causes unrelated to the acts or omissions of the Lessee; (d) acts of war or public disorders, civil disturbances, riots, insurrection, sabotage, epidemics, terrorist acts, or rebellion; and (iv) actions of the government including appropriation, acquisition, or any action affecting the operation of the Project.

- "Girdawari" means the bi-annual crop cultivation report by the Revenue Department
- "Land Parcel" shall mean the land admeasuring 4.5 Acres, classified as land with full transferable rights under all applicable laws, comprising Khassra No. / Gatta No. as per clauses 3(a)
- "Lease Period" shall mean a continuous period of 27 years, commencing from 1<sup>st</sup> August 2023 and expiring on 31<sup>st</sup> July, 2050.
- Creation of Lease**
  - The Lessors hereby jointly lease the Land Parcel for the Lease Period to the Lessee and the Lessee hereby accepts the aforesaid lease on the terms and conditions specified herein for the Lease Period.
  - In the event of any Lessor's death/insolvency, this Lease Deed shall be valid on their successors, legal heirs, administrators, nominees, representatives, assigns and the persons claiming under them in any capacity whatsoever.
- Representations and Warranties**
  - The Lessors jointly and severally represent, warrant and agree that:
    - They are the only joint and absolute owners of land admeasuring 4.5 Acres of land (i.e. 21 bigha and 12 Biswa), classified as land with full transferable rights under all applicable laws, comprising Khassra No. / Gatta No. as follows

Khassra No.	Bigha	Biswa
120	14	4
22	4	16
23	4	16
24/1	2	08
7	4	16
<b>Total</b>	<b>21</b>	<b>12</b>

**Annexure-2 : PVSYST Report**



Version 7.2.4

## PVsyst - Simulation report

### Grid-Connected System

Project: 4MW\_Delhi\_Ground\_Mounted\_Project\_(VNM)\_Auchandi\_New Delhi

Variant: New simulation variant

No 3D scene defined, no shadings

System power: 3998 kWp

Delhi Ground Mounted Project(VNM) - India



Project:  
4MW\_Delhi\_Ground\_Mounted\_Project\_(VNM)\_Auchandi\_New Delhi

Variant: New simulation variant

**PVsyst V7.2.4**  
 VC0. Simulation date:  
 19/08/23 19:20  
 with v7.2.4

Project summary			
<b>Geographical Site</b> Delhi Ground Mounted Project(VNM) India	<b>Situation</b> Latitude 28.83 °N Longitude 77.00 °E Altitude 214 m Time zone UTC+5.5	<b>Project settings</b> Albedo 0.20	
<b>Meteo data</b> Delhi_Ground_Mounted_Project (VNM) Meteorom 8.0 (1981-2010), Sat=3% - Synthetic			

System summary			
<b>Grid-Connected System</b> Simulation for year no 10		<b>No 3D scene defined, no shadings</b>	
<b>PV Field Orientation</b> Fixed plane Tit/Azimuth 10 / 0 °	<b>Near Shadings</b> No Shadings	<b>User's needs</b> Unlimited load (grid)	
<b>System information</b> <b>PV Array</b> Nb. of modules 7336 units Pnom total 3998 kWp		<b>Inverters</b> Nb. of units 12 units Pnom total 2640 kWac Pnom ratio 1.514	

Results summary			
Produced Energy	6037 MWh/year	Specific production	1510 kWh/kWp/year Perf. Ratio PR 78.44 %







PVsyst V7.2.4

VC0, Simulation date:  
19/08/23 19:20  
with v7.2.4

Project:  
4MW\_Delhi\_Ground\_Mounted\_Project\_(VNM)\_Auchandi\_New  
Delhi

Variant: New simulation variant

## Main results

## System Production

Produced Energy

6037 MWh/year

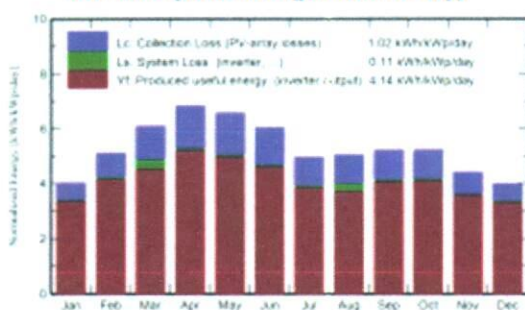
Specific production

1510 kWh/kWp/year

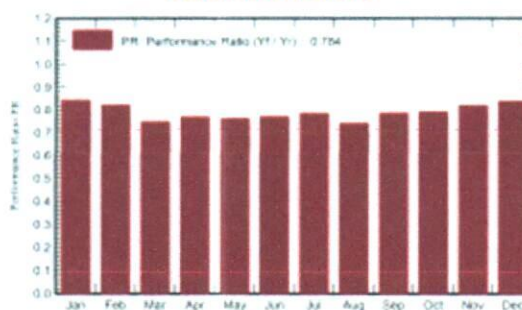
Performance Ratio PR

78.44 %

## Normalized productions (per installed kWp)



## Performance Ratio PR

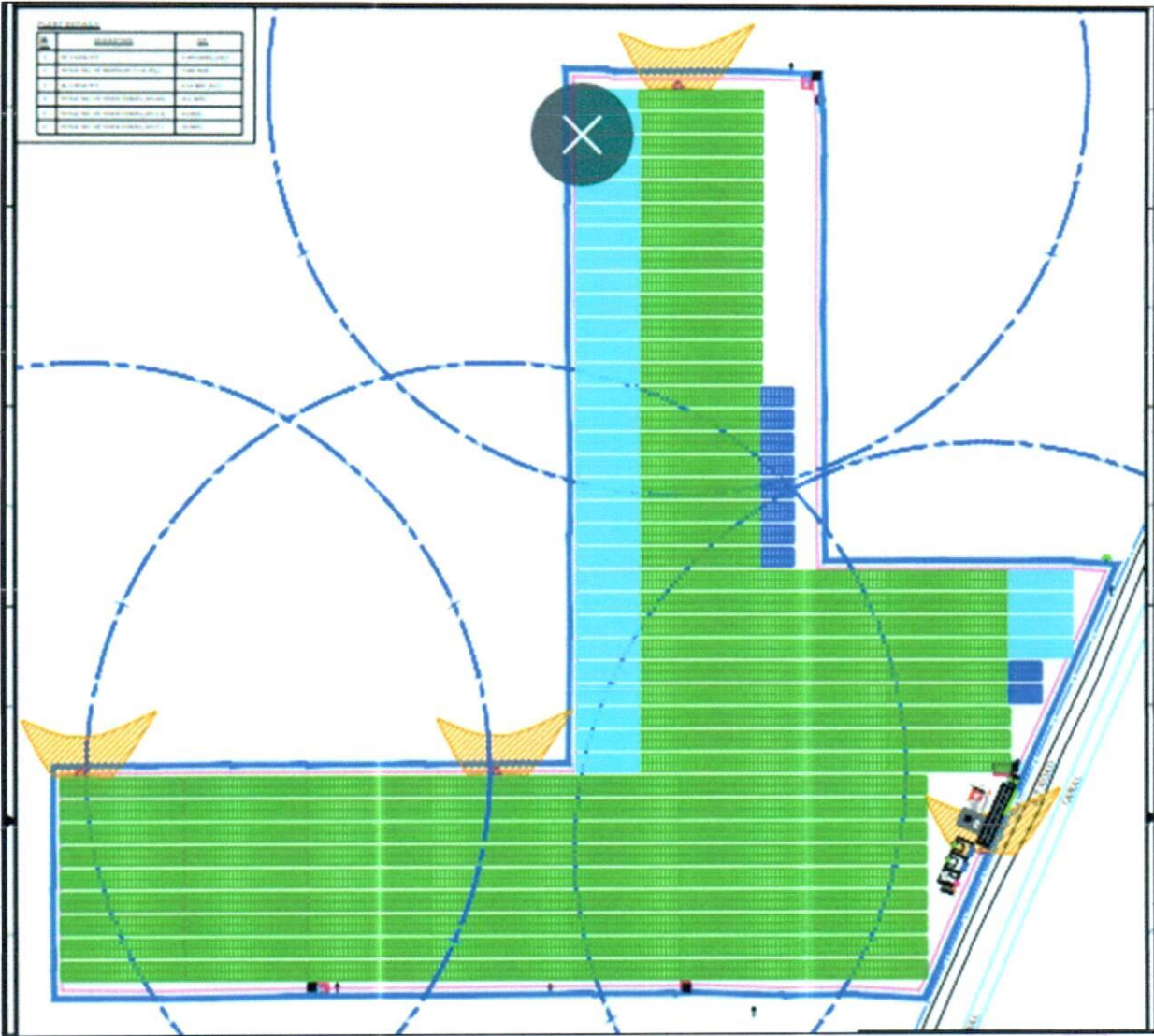


## Balances and main results

	GlobHor kWh/m <sup>2</sup>	DriftHor kWh/m <sup>2</sup>	T_Amb °C	GlobInc kWh/m <sup>2</sup>	GlobEff kWh/m <sup>2</sup>	EArray MWh	E_Grid MWh	PR ratio
January	106.7	43.9	13.34	124.3	122.6	425.7	418.7	0.843
February	126.3	48.8	17.68	142.5	140.7	475.3	467.6	0.821
March	174.7	65.2	23.80	188.4	185.9	607.1	562.7	0.747
April	197.7	75.5	29.77	204.6	202.0	639.1	628.2	0.768
May	203.2	100.3	33.66	203.5	200.8	630.1	619.7	0.762
June	182.6	103.5	33.28	180.7	178.2	564.6	555.3	0.769
July	154.4	99.9	31.48	153.1	150.8	488.0	480.0	0.784
August	154.0	91.7	30.43	155.9	153.7	497.6	461.6	0.740
September	148.8	78.3	29.16	155.8	153.7	497.9	489.5	0.786
October	147.1	66.3	26.72	161.5	159.4	519.3	510.6	0.791
November	114.3	49.9	20.50	131.6	129.8	437.5	430.6	0.818
December	104.1	42.7	15.08	123.1	121.5	419.2	412.4	0.838
Year	1813.9	865.9	25.44	1925.0	1899.1	6201.3	6036.9	0.784



**Annexure-3: Layout Plan**





**Annexure-4: EPC Contract:**

**ENGINEERING, PROCUREMENT AND CONSTRUCTION CONTRACT**

This contract is entered into at New Delhi on 18 January 2023 between:

**TALF SAC SOLAR URJA PRIVATE LIMITED** (CIN U29100DL2022PTC393623), a Company incorporated under the provisions of the Companies Act, 2013 and having its registered office at B-9, 6428, Vasant Kunj, Delhi 110070 (hereinafter referred to as the "**Client**", which expression will, unless repugnant to the context or meaning thereof, be deemed to mean and include its successors and permitted assigns).

AND

**TALF SOLAR INDIA PRIVATE LIMITED** (CIN U74999DL2017PTC314309), a Company incorporated under the provisions of the Companies Act, 2013 and having its registered office at B-9, 6428, Vasant Kunj, Delhi 110070, India (hereinafter referred to as "**Contractor**", which expression will, unless repugnant to the context or meaning thereof, be deemed to mean and include its successors and permitted assigns);

The Client and the Contractor are each individually referred to as a "**Party**" and collectively as the "**Parties**".

**WHEREAS:**

- (A) **The Contractor** provides comprehensive solar solutions to governments, corporate houses, villages, industries and other consumers.
- (B) **The Client** is solar plant developer proposing to install the capacity of Ground Mounted solar power plant with repowering. Client was awarded capacity by various counterparties such as, Hansraj College, University of Delhi; Hindu College, University of Delhi; Miranda House, University of Delhi; Sri Guru Gobind Singh College of Commerce, University of Delhi; Ashoka Education & Welfare Society, and; IUA Trust.
- (C) **The Client** wants and the Contractor has agreed to design, construct and install, solar plant having an aggregate DC Capacity of 3,906 KW<sub>DC</sub> on agriculture land at Auchandi, North West Delhi, Delhi – 110039, under VNM scheme of Government of Delhi.
- (D) **The CONTRACTOR and CLIENT** have agreed to enter into this Agreement to document the roles and responsibilities of both the parties with respect to completion of the Contractor's work at the above-mentioned location.

The Parties hereby agree as below:

**1. BINDING & FINAL AGREEMENT**

- 1.1. This agreement shall enter into effect from the date of its execution, and from such date, shall constitute a binding contract between the Parties for the duration of the Agreement.
- 1.2. This Agreement terminates and supersedes all prior understandings or agreements on the subject matter hereof, and is binding upon each Party and its successors and assigns

Client <i>Sunabhi</i>	Contractor <i>rk</i>
-----------------------	----------------------

Page 1 of 11



**Annexure-5: 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 27<sup>th</sup> 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	Up to 1 kW	> 1 kW upto 2 kW	>2kW Upto 3kW	> 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





### Annexure-6: Market Comparables

Installation Cost of 1MW Power Plant	
For better understanding of investment in 1 megawatt solar power system, we have break down the overall cost in fragments. You can now compare and analyse the cost of solar panels, solar inverters and other accessories individually.	
Particulars	Estimated Cost
Solar Panels	3 Cr.
Solar Inverter	1 Cr.
Combiners + Junction Boxes	20 Lakh
Protective Gears Arrangement	10 Lakh
SCADA & Data Logger System	7 Lakh
Land Bank	*5 Acre
Erection of Project	50 Lakh
<b>Total Project Cost</b>	<b>4.87 Cr. (Approx.)</b>
<ul style="list-style-type: none"> <li>*Land value of 5 acre is not included in this table.</li> <li>All the figures in above table are just to provide a rough idea. Don't consider it as an exact and final cost of 1MW solar power plant.</li> </ul>	



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You can later on also buy this plant from the vendor.

## Cost of 1 MW solar plant

Now, let us discuss the cost of 1 MW solar plant. There is no fixed number for the final 1 MW solar plant cost. However, we have a tentative figure – between 4 to 5 crore.

This price range is subject to increase or decrease depending on various factors. Here are some factors affecting the overall 1 megawatt solar power plant cost.

- Type of solar panels selected – **monocrystalline or polycrystalline panels**
- Manufacturing technology and efficiency of the solar inverter selected
- Solar brand opted
- Type of solar power plant – on-Grid, off-grid, or hybrid

Concerning the 1 MW solar power plant subsidy 2020, the **government provides subsidies** on solar plants for residential setups and housing societies. No subsidy is offered for solar systems being installed for commercial purposes.

*[Handwritten Signature]*

*[Handwritten Mark]*



# LIE REPORT

M/S TALF SAC SOLAR URJA PRIVATE LIMITED

## Project Cost (Mono-Crystalline) included GST

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
<b>Total (GST Included)</b>		<b>1,06,25,000 /-</b>

➤ Discom Legal & Liasoning Fees included above.

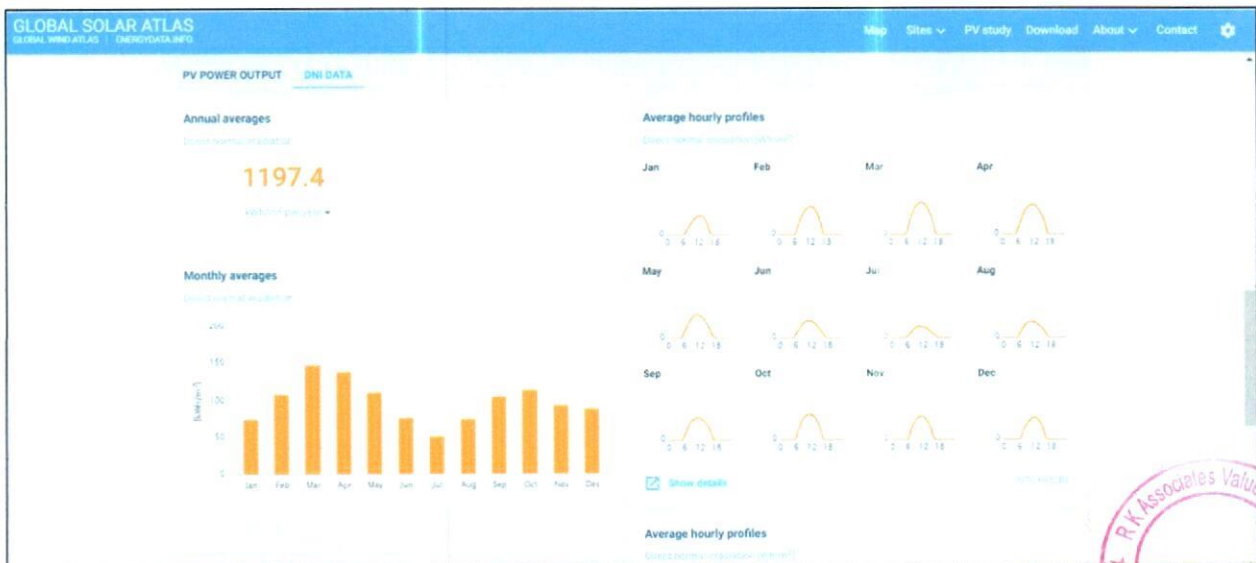
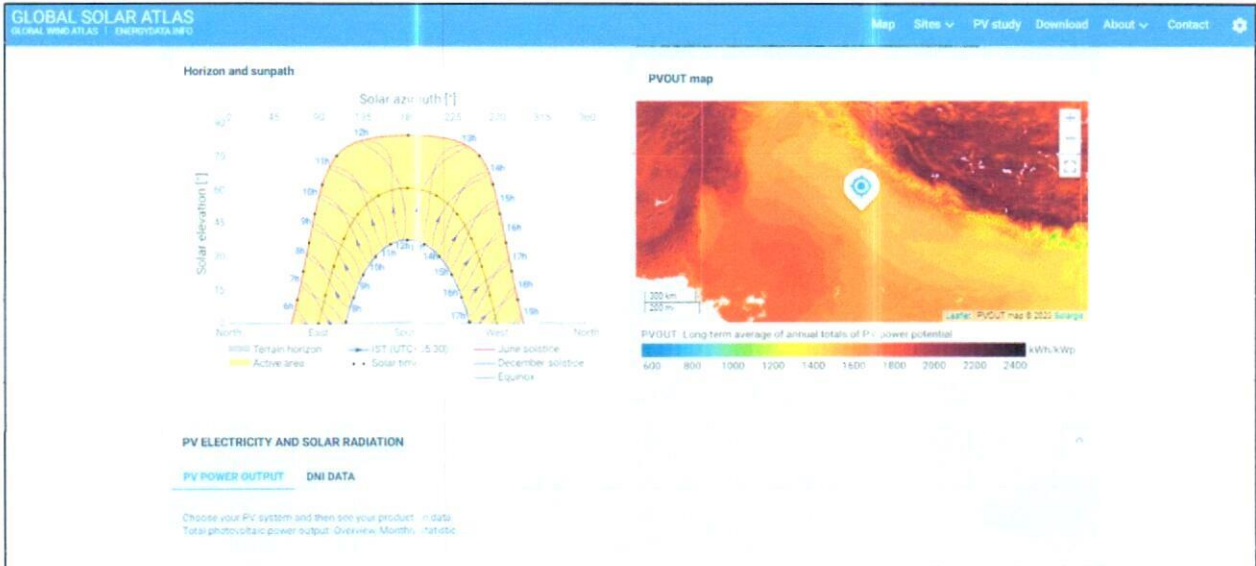
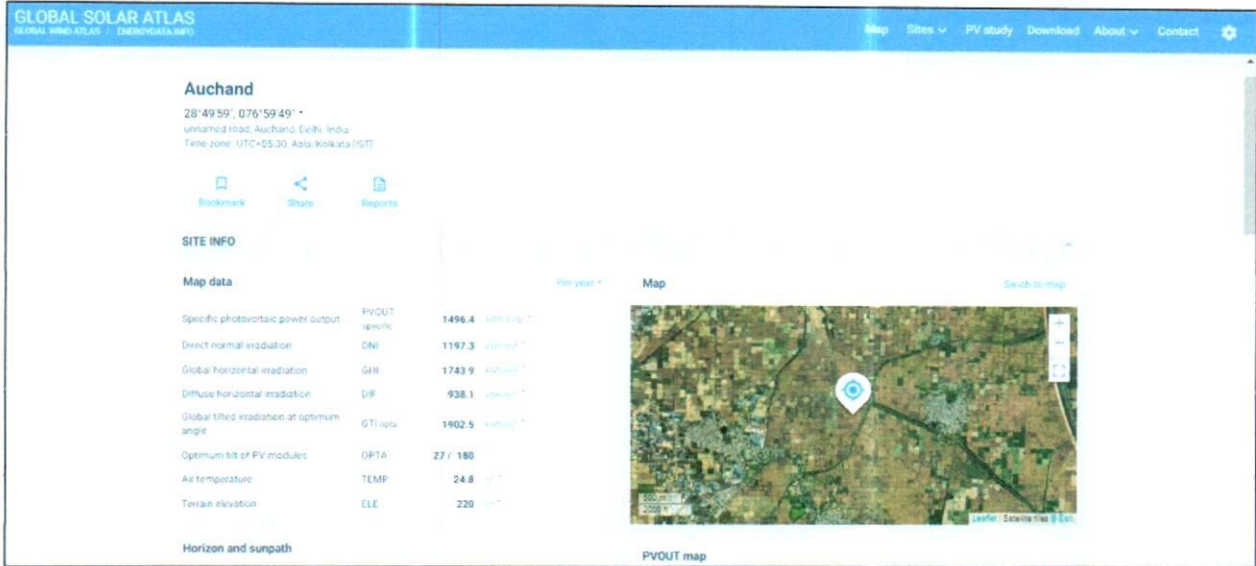
**Shubham Agarwal & Praveen Mehta**  
**SOLAR NATION**

M- +91 9461846401,9829227948 Email – [solarnationbusiness@gmail.com](mailto:solarnationbusiness@gmail.com)



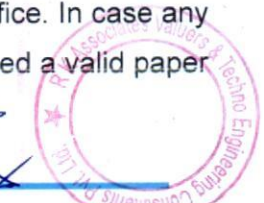


**Annexure-6: Data by Global Solar Atlas by World Bank Group**



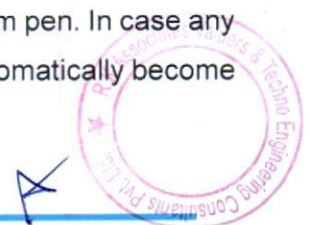
**PART J****DISCLAIMER**

1. No employee or member of R.K Associates has any direct/ indirect interest in the Project.
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.





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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Place : Noida

SURVEYED BY: Abhinav Chaturvedi

Date : 25.09.2023

PREPARED BY: Vishal Singh

REVIEWED BY: Abhinav Chaturvedi

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

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