Tax Invoice

Valid for Input Tax

(ORIGINAL FOR RECIPIENT)

e-Invoice

IRN : 7c98ab30d672c3e28417a02c2e690b6361f75502-3ded1f93dd77827b8a9430a0
Ack No. : 182313322425570
Ack Date : 31-Mar-23

DS Systems Pvt. Ltd
Odalbakra,Near Sabitri Bharali M.E.School
Guwahati-781034
GSTIN/UIN: 18AACCD8183C1ZO
State Name : Assam, Code : 18
E-Mail : info@dssystems.in

Invoice No.	e-Way Bill No.	Dated
DSSPL/G/2223/775		31-Mar-23
Delivery Note		Mode/Terms of Payment
Reference No. & Date.		Other References
Buyer's Order No.		Dated
AST/energy/AICTE-GAINER-SOLAR/2022/74544		24-Feb-23
Dispatch Doc No.		Delivery Note Date
Dispatched through		Destination
Terms of Delivery		

Consignee (Ship to)
The Registrar
Assam Science & Technology University
Tetelia Road
Jalukbari, Guwahati-781013
Assam
GSTIN/UIN : 18SHLA02925G1DF
State Name : Assam, Code : 18

Buyer (Bill to)
The Registrar
Assam Science & Technology University
Tetelia Road
Jalukbari, Guwahati-781013
Assam
GSTIN/UIN : 18SHLA02925G1DF
State Name : Assam, Code : 18
Place of Supply : Assam

Sl No.	Description of Goods and Services	HSN/SAC	Quantity	Rate	per	Disc. %	Amount
1	**Supply of 15KWp Hybrid Solar PV Power Plant**	85044090	1 set	15,00,000.00	set		15,00,000.00
2	**Installation and Commissioning and AMC** *Installation, Commissioning and AMC Of 15KWP Hybrid Solar PV Power Plant*	998713	1 Job	1,12,711.86	Job		1,12,711.86
							16,12,711.86
	CGST OUTPUT @6%			6	%		90,000.00
	SGST Output @6%			6	%		90,000.00
	CGST OUTPUT @9%			9	%		10,144.07
	SGST OUTPUT @9%			9	%		10,144.07
	Total						₹ 16,13,000.00

Amount Chargeable (in words) E. & O.E
Indian Rupees Eighteen Lakh Thirteen Thousand Only

HSN/SAC	Taxable Value	Central Tax Rate	Central Tax Amount	State Tax Rate	State Tax Amount	Total Tax Amount
85044090	15,00,000.00	6%	90,000.00	6%	90,000.00	1,80,000.00
998713	1,12,711.86	9%	10,144.07	9%	10,144.07	20,288.14
Total	16,12,711.86		1,00,144.07		1,00,144.07	2,00,288.14

Tax Amount (in words) **Indian Rupees Two Lakh Two Hundred Eighty Eight and Fourteen paise Only**

Company's VAT TIN : 18220096636
Company's CST No. : 18899927155
Company's Service Tax No. : AACCD8183CST001
Company's PAN : AACCD8183C

Company's Bank Details
Bank Name : ICICI Bank
A/c No. : 332405500215
Branch & IFS Code : Guwahati Uzanbazar & ICIC0003324

Declaration
1.We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct 2. Interest @18% shall be charged on all unpaid bills after 15 days of presentation 3. Goods Once sold will not taken back

for DS Systems Pvt. Ltd
Authorised Signatory

SUBJECT TO GUWAHATI JURISDICTION

This is a Computer Generated Invoice

Assam Science And Technology University * Gauhati * 277 07/6/23

Dr. P. Baro / VC (Thakur Sir)
Pl. take necessary action
05/06/2023

DS SYSTEMS PVT LTD * GUWAHATI-781034

DS SYSTEMS PVT. LTD.
Odalbakra, Near Sabitri Bharali ME School,
Guwahati-781034 Assam
9678008031, 9678008032 Telfree No - 1800 345 3716
E-mail : service.hq@dssystems.in, info@dssystems.in

DS Systems

SOLAR UPS INSTALLATION REPORT

CUSTOMER'S NAME ...A.S.T.C. JALUKBARI.....

INSTALLATION SITE
Address : A S T C JALUKBARI
Contact Person & Tel No. :

REPORT NO	
CALL NO.	
AUTHORISED BY	DSSPL
ENGINEER IN TIME	
ENGINEER OUT TIME	

DATE OF INSTALLATION 29/05/23

SOLAR UPS TYPE Online DC VOLTAGE 240V UPS CAPACITY 23CN4351A0 (20kVA)

BATTERY TYPE SMS BATTERY MAKE Exide BATTERY CAPACITY 12V/100AH SERIAL NO 23CN4351A0

LOAD TYPE _____ PERCENTAGE OF LOAD _____

CHECK POINTS

SITE ELECTRICAL WIRING DONE BY D.S Systems Pvt Ltd.

AC INPUT VOLTAGE (1PHASE/3PHASE)	401V			
AC OUTPUT VOLTAGE (1PHASE/3PHASE)	405V			
SYSTEM DC VOLTAGE ON MAINS	296V			
VOLTAGE BETWEEN NEUTRAL & EARTH	I/P SIDE	0.2V	O/P SIDE	0.1V

TRAINING	OPERATION	PRECAUTION
✓	✓	✓

CUSTOMER's REMARKS .....

.....

Certificate that the equipment is Installed & commissioned

ENGINEER's REMARKS 29 Nos Solar Panel, 20Nos 100AH Battery, All UPS To Out UPS Output Solar Wiring and Installium done, UPS is working on

SIGNATURE OF CUSTOMER

(Name & Designation with Seal)

SIGNATURE OF SERVICE ENGINEER

Name DEEPAK BORUAH.

DS SYSTEMS PVT LTD. GUWAHATI-781034

CHALLAN

DS SYSTEMS PVT. LTD.

Odalbakra, Near Sabitri Bharali M.E. School,
Guwahati-781034, Assam,
Phone No: 9678008031/32
e-mail: info@dssystems.in

GSTIN 18AACCD8183C1ZO

Buyer: -
The Registrar
Assam Science & Technology University
Tetelia Road
Jalukbari, Guwahati-781013
Assam
GSTIN : 18SHLA02925G1DF

Consignee: -
The Registrar
Assam Science & Technology University
Tetelia Road
Jalukbari, Guwahati-781013
Assam
Contact Person :
Contact No.#

Challan No.	DSSPL/GHY/SOL/775/22-23
Date	31.03.2023
Dispatched by	
Vehicle No	AS25/AC-9088
Invoice No.	DSSPL/G/2223/775 Date : 31 Mar 2023

The Item(s) sending herewith are for Sale

Order Ref: ASTU/energy/ARCTL-GAINER-SOLAR/2022/74/8544 DATED: 24/02/2023

Please receive the under mentioned in order & acknowledge receipt by returning 3 copies duly signed & stamped. And discrepancy or defect in regard to these must be brought to our notice within 24 hours of receipts of goods.

S No	Qty	Particulars	No of Boxes	UPS S. No	Remarks
01	01 Nos (One)	Solar Inverter 20KVA	01 Box		
02	20 Nos (Twenty)	EXIDE 12V 100AH Tubular Battery	20 Boxes		
		Total no of Packet:	21 Boxes		

Received the above goods in good condition

(packet Received Sl No 1 & 2)

Signature & Seal of receiving person

For DS SYSTEMS PVT LTD

DS SYSTEMS PVT LTD GUWAHATI-781034

Assam Science And Technology University Guwahati

DS SYSTEMS PVT LTD GUWAHATI-781034

ASSAM SCIENCE AND TECHNOLOGY UNIVERSITY

(A State University of Government of Assam constituted by "Assam Science and Technology University Act, 2009")
Tetelia Road, Near Assam Engineering College, Jalukbari, Guwahati-781013, Assam
Website: www.astu.ac.in

No. ASTU/energy/AICTE-GAINER-SOLAR/2022/74/ 8544 Date: -24/02/2023

From
Dr. Nripen Das
Registrar
Assam Science and Technology University (ASTU), Jalukbari, Guwahati – 13, Assam

To,
DS Systems Pvt. Ltd.,
Odalbakra, Near Sabitri Bharali ME School, Guwahati - 781034, Assam

Sub: Work Order for the "DESIGN, SUPPLY, INSTALLATION & COMMISSIONING OF 15 kWp (MINIMUM) HYBRID SOLAR PV POWER PLANT"

Ref: 1. Tender Ref. No.: ASTU/energy/AICTE-GAINER-SOLAR/2022/74/7931 dated 12.01.2023
2. Letter No.: ASTU/energy/AICTE-GAINER-SOLAR/2022/74/8164 dated 06.02.2023
3. Your Tender (Technical & Financial Bids): DSSPL/SKG/UPS/202-23/238 dated 01.02.2023
4. Your Tender on Response to Queries: DSSPL/SKG/UPS/202-23/238 dated 08.02.2023
5. LOI: ASTU/energy/AICTE-GAINER-SOLAR/2022/74/8454 dated 22.02.2023

Sir,

With references to the above, you are hereby informed to execute the work entitled "DESIGN, SUPPLY, INSTALLATION & COMMISSIONING OF 15 kWp (MINIMUM) HYBRID SOLAR PV POWER PLANT" as per the following approved rates.

Sl No.	Work	Quantity	Total amount incl. GST and other liabilities (in Rs.)
1	DESIGN, SUPPLY, INSTALLATION, COMMISSIONING & AMC OF 15 kWp (MINIMUM) HYBRID SOLAR PV POWER PLANT *(as per the technical specifications and scope of the work provided in Annex-A)*	01 (one) Job	1813000.00
Grand Total (including GST and other liabilities) - Rupees Eighteen Lakhs Thirteen Thousand only			1813000.00

N.B.: The allotted work should be adhered to and complied with the specifications mentioned in the NIQ (ASTU/energy/AICTE-GAINER-SOLAR/2022/74/7931 dated 12.01.2023), conditions within the provisions of the 'contract agreement' signed between ASTU and your organization on 23.02.2023, the relevant items/components/jobs offered by you in the technical and financial bids as well as through clarifications (in terms of quantity and quality) and all other applicable terms and conditions, as mentioned, within the provision of the offered work.

Registrar
Date: -24/02/2023

No. ASTU/energy/AICTE-GAINER-SOLAR/2022/74/
Copy to:
1. Secretary to VC for kind information of Hon'ble Vice Chancellor, ASTU
2. The Adviser, IDC, AICTE, Nelson Mandela Marg, Vasant Kunj, New Delhi-110070
3. Finance and Accounts Officer, ASTU
4. Office file

Registrar

DS SYSTEMS PVT. LTD. GUWAHATI-781034

Annex-A

Ref: ASTU/energy/AICTE-GAINER-SOLAR/2022/74/7931 dated 12.01.2023

GENERAL TECHNICAL SPECIFICATIONS

1 PV MODULES:

1.1. The PV modules must conform to the latest edition of any of the following IEC /BIS /IS Standards for PV module design qualification and type approval:

- Crystalline Silicon Terrestrial PV Modules IEC 61215 / IS14286
- Thin film Terrestrial PV Modules IEC 61646
- Concentrator PV Modules & Assemblies IEC 62108

1.2. In addition, the modules must conform to IEC 61730 Part 1- requirements for construction & Part 2 - requirements for testing, for safety qualification or Equivalent IS (Under Dev.)

1.3. PV Modules to be used in a highly corrosive atmosphere must qualify Salt Mist corrosion Testing as per IEC 61701/ IS 61701.

1.4. IV Curve both soft copy & hard copy must be provided (Image / PDF)

1.5. IDENTIFICATION AND TRACEABILITY

Each PV modules must use a RF identification tag (RFID), which must contain the following information:

i. Name of the manufacturer of PV Module.
ii. Name of the Manufacturer of solar cells.
iii. Month and year of the manufacture (separately for solar cells and modules).
iv. Country of origin (separately for solar cells and modules).
v. I-V curve for the module.
vi. Peak Wattage, Im, Vm and FF for the module.
vii. Unique Serial No and Model No of the module.
viii. Date and year of the obtaining IEC PV module qualification certificate.
ix. Name of the test lab issuing IEC certificate.
x. Other relevant information on traceability of solar cells and modules as per ISO 9000 series.

Until March 2013, the RFID can be inside or outside the module laminate but must be able to withstand harsh environmental conditions. However, from 1st April 2013 onwards; RFID can be inside the module laminate.

2. BALANCE OF SYSTEM(BOS) ITEMS/COMPONENTS:

The BOS items / components of the SPV power plants/ systems must conform to the latest edition of IEC / Equivalent BIS Standards / MNRE specifications as specified below:

DS SYSTEMS PVT LTD GUWAHATI-781034

Component name	Applicable BIS /Equivalent IEC Standard or MNRE Specifications
Inverter	**IEC 62109-1,2**: Safety of power converters for use in photovoltaic power systems - **Part 1**: General requirements, and Safety of power converters for use in photovoltaic power systems. **Part 2**: Particular requirements for inverters. Safety compliance (Protection degree **IP 65** for outdoor mounting, **IP 54** for indoor mounting). **IEC/IS 61683:** Photovoltaic Systems – Power conditioners: Procedure for Measuring Efficiency (10%, 25%, 50%, 75% & 90-100% Loading Conditions). **IEC 60068-2 (1, 2, 14, 30 & 64)**: Environmental Testing of PV System – Power Conditioners and Inverters.
Battery	**IEC 62133**: (Secondary cells and batteries for renewable energy storage - General requirements and methods of test - Part 1: Photovoltaic off-grid/Hybrid application).
Cables	**IEC 60227/IS 694, IEC 60502/IS 1554 (Part 1 & 2):** General test and measuring method for PVC (Polyvinyl chloride) insulated cables (for working voltages up to and including 1100 V, and UV resistant for outdoor installation). **BS EN 50618**: Electric cables for photovoltaic systems (BT(DE/NOT)258), mainly for DC cables.
Connectors	Certified for applications with modules according to **IEC 61730**
Array box	Protection: **IP 65** enclosures with transparent covers with Surge Protection Device (SPD) class-I II, DC Fuse with holder and string disconnector.
Weather monitoring system	**IS/IEC 61724 (1998):** Photovoltaic System Performance Monitoring -Guidelines for Measurement, Data exchange and Analysis
Supervisory control and data acquisition (SCADA)	Protocol defined for substation automation: **IEC 61850**
Cable glands	**IEC 62444:2010**
Cable Lugs	**IEC 1238 part 1:** Applies to electrical and mechanical properties of cable lugs
Cable ties, ferrules	**IEC 62275, IEC 61300**

Cable Trays	**IEC 1084-2:** Specifies requirements for cable trunking and ducting systems intended for mounting on walls or ceilings.
Lightning arrestor	**IEC 62561 Series (Chemical earthing):** **IEC 62561-1:** Lightning protection system components (LPSC) – **Part 1:** Requirements for connection components **IEC 62561-2:** Lightning protection system components (LPSC) – **Part 2:** Requirements for conductors and earth electrodes **IEC 62561-7** Lightning protection system components (LPSC) – **Part 7**: Requirements for earthing enhancing compound.
Fuses	**IS/ IEC 60947 (Part 1, 2 & 3), EN 50521**: General safety requirements for connectors, switches, circuit breakers (AC/ DC). **IEC 60269-6:** Low-voltage fuses.

* In Case if the charge controller is inbuilt in the inverter, no separate IEC 62093 test is required and must additionally conform to the relevant National/ International Electrical Safety Standards wherever applicable.
* Various components of solar PowerPlants must additionally conform to the relevant National/International Electrical safety standards wherever applicable.
* The minimum capacity of PCU/ Inverters (in KVA) should be kept at least equal to thetotal wattage of solar modules of the system (in kWp).

3. MODULE MOUNTING STRUCTURE

Modules shall be mounted on non-corrosive support structures towards due south and at a suitable inclination to maximize annual energy output. Support structure design and foundation or fixation mounting arrangements should withstand horizontal wind speed up to 150 km/ hr. In snowbound areas the structure should be capable of withstanding loads of snow. Support structures shall be manufactured with steel angles & channels; spray galvanized to IS 1477 Part -1 with thickness of 80 microns as per IS 5905. All fasteners shall be of Stainless steel - SS 304. The mounting structure shall be designed in such a way that it will occupy minimum space without sacrificing the output from SPV modules. Specially designed Aluminium structures may also be offered for better protection against the corrosion over the life of the plant. While making Civil & Mechanical design, due consideration will be given to all the dead loads, live loads, effects of wind load, Seismic factors for the site and suitable Design margins as per prevalent Indian standard and Industry practices.

4. DC DISTRIBUTION BOARD (DCDB)

A DCDB shall be provided in between PCU and Solar Array. It shall have MCCB of Suitable rating for connection and disconnection of array section. It shall have meters for measuring Array voltage and Array current.

5. DOCUMENTATION

The contractor Shall provide various documents as per following:

A. Documents to Tendering Authority

i. Site specific documents to be submitted (with bill for payment against clause no. 30.2/30.3 of payment terms).

- Photograph of all the equipment of Power Plant (hard copy & soft copy).
- Summary details of the plant (annexure-I) .
- Joint inspection report from district level officer of..... (annexure-II).
- certificate for Handing over the system to beneficiary (annexure-III).
- Letter towards Warranty of the system (annexure-IV).
- performance ratio test for satisfactory functioning of the system (annexure-V).

- contact details of various service centres.
- User manual for solar power plant including details for operation and maintenance.
- Routing diagram of cables and wires.

xi. Documents to be submitted for one time for every make of component (with bill for payment against clause no. 30.2/30.3 of payment terms)

a) Undertaking from Solar PV Panel Supplier for modules being indigenous.
b) IEC certificate module-IEC 61215/61646/62108.
c) IEC certificate for module safety qualification -IEC 61730.
d) Test certificate for Inverter/PCU-IEC 61683 and IEC 60068-2.
e) IS 2062 certificate for module Mounting frames and leg assemblies.
f) Stand report for mounting structure to withstand wind load of 150 Kmph.
g) Cable certificate-IEC 60227/IEC60502
h) Switch, Circuit breakers, connectors certificate-IEC 60947 part I, II, III/ IS 60947 part I, II, III/EN 5052.
i) Junction boxes certificate confirming to IP 65/21 as per IEC 529.
j) Lighting arrester certificate – IS 3043-1986.
k) Surge protection certificate – IS 60364-5-53
l) Layout of solar modules
m) All other drawings/ sketch/ line diagram

6. AUTHORIZED TESTING LABORATORIES/CENTERS

Test certificates / reports can be from any of the NABL/ IEC accredited testing laboratories or MNRE approved test centres.

7. MAIN FEATURES & OPERATING MODE

- Clean regulated power to the load.
- "No-break" transfers from renewable energy to battery and battery to grid.
- MPPT solar charge regulator.
- The PCU shall operate with solar priority for feeding load and charging batteries.
- Stored power from batteries shall be the second priority to feed the load.
- Grid power shall be the last priority to feed the load. During such time, the PCU shall feed the load directly through the grid and shall also charge the batteries. Battery Charging through Grid shall be taken up only when batteries are undercharged and solar is not available or insufficient.

8. WARRANTY

PV modules used in Solar PV Power Plant must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years. The mechanical structures, electrical works including Power conditioners/ inverters/ charge controllers/ maximum power point tracker units/ distribution boards/ digital meters/ switchgear/ storage batteries, etc. and overall workmanship of the Solar SPV Power Plant system must be warranted against any manufacturing/ design/ installation defects for a minimum period of 5 years. The Warranty/ Guarantee Card to be supplied with the Solar PV Power Plant must contain the details of the system supplied, as given in the Annexure-IV. The tenderer can provide additional information about the system.

9. OPERATION MANUAL

An Operation, Instruction and Maintenance Manual, in English, should be provided with the Solar PV Power Plant and detail of Wiring and Connection Diagrams will also be provided with the manual.

10. OTHER FEATURES

Only indigenously manufactured Solar PV Modules which fully conform to the MNRE specifications shall be procured. All the technical & other requirements as per provisions under JNNSM of MNRE must be fulfilled. Use of imported Solar PV Modules is not permitted.

11. CAUTION SIGNS

DS SYSTEMS PVT LTD GUWAHATI-781

The standard caution and danger boards or labels as per Indian Electricity Rules, the AC distribution box near the solar inverter and the building distribution board to which the AC output of the solar PV system is connected shall be provided with a noncorrosive caution label.

12. QUALITY AND WORKMANSHIP

Solar PV Modules are designed to last 25 years or more. It is therefore essential that any system components and parts, including the mounting structures, cables, junction boxes, distribution boxes and other parts also have a life cycle of at least 25 years. Therefore, all works shall be undertaken with the highest level of quality and workmanship. During inspection Tendering Authority and its representatives will pay special attention to neatness of work execution and conformity with quality and safety norms. Non-compliant works will have to be redone at the cost of the Installer.

13. OTHER REQUIREMENTS

The other referred Technical specifications have been prescribed by MNRE shall have to be maintained accordingly. Any supplies which have not been specifically mentioned in this contract but which are necessary for the design, engineering, manufacture, supply & performance or completeness of the project shall be provided by the contractor without any extra cost and within the time schedule for efficient and smooth operation and maintenance of the SPV Plant.

SCOPE OF THE WORK

The work shall include Design, Fabrication, Manufacturing, Supply, Installation, Testing & Commissioning of 15 kWp (Minimum) Hybrid Solar power plants including warranty & maintenance for 5 years at "New Academic Building of Assam Science and Technology University (ASTU), Tetelia Road, Jalukbari, Guwahati – 781013, Assam, India".

A. All works required for proper installation of Solar PV Power Plant including necessary civil and welding works for mounting structures of solar module, shall be done by the contractor. The entire work shall be performed on turnkey basis. All the works related to the proper installation and functioning of the system shall have to be carried out by the contractor in the prices offered by him.

B. All necessary electrical wiring from electrical distribution box up to PCU of Solar PV Power Plant and back from PCU to distribution box shall have to be done by the contractor including supply of all required materials.

C. The generated electricity from the power plant will be utilized to energize the dedicated load of the building. In case separate additional electric cable/wiring etc is required for connecting the dedicated load with solar power plant, it shall have to be supplied and laid down by the contractor as per requirement at the site and shall be covered in the scope of work. The wiring shall have to be done in concealed conduits.

D. The proposed dedicated load to be energized through Solar Power plant shall have to be decided as per the storage capacity of solar Power Plant in consultation with the Tendering Authority.

E. Necessary arrangements for storage of batteries of solar PV Power plant as per requirements for their proper protection shall have to be done by the contractor. Appropriate cabinets for battery banks, with the provision of racks for batteries should also be done if required, battery rooms of the adequate size with proper ventilation shall have to be prepared according to the direction of the Tendering Authority.

F. After completion of the proposed works, clearances of all temporary works/ materials shall be the sole responsibility of the contractor and this shall be removed immediately after the requirement of such temporary work is completed.

G. General Aesthetics & cleanliness in regard to the installation of various systems shall have to be maintained in accordance with the aesthetics of the site.

H. Arrangement of proper earthing mechanism and lightning arresters should be done at site as per the requirements of the solar power plant.

I. The contractor shall supply/install the necessary tools/instruments required for proper operation of the plant and measure PV array Voltage, current, Power and solar radiation.

QS SYSTEMS PVT LTD GUWAHATI-781034

J. Supply and Installation of Display board of '3ft X 2ft' size showing all technical information of SPV plant shall be done by the contractor. The matter written on these boards shall be as per annexure-I.
K. The complete Solar PV Power Plant shall be handed over by the contractor to the beneficiary on the format at annexure-III
L. The complete Solar PV Power Plant shall be warranted and maintained by the contractor against any manufacturing/ design/ installation defects for a minimum period of 5 years from the date of installation.
M. Warranty, operation and Maintenance period will include rectification/ replacements of all the defective and consumable components/ items including batteries. However, all the non-functional parts/ materials/ items replaced during the warranty, operation and maintenance period shall be the property of the contractor.
N. After commissioning of the plant, the contractor will conduct one on-site training of the purchaser's /user's personnel regarding assembly, start-up, operation, maintenance and repairs of the Solar PV Power Plant.
O. During the 5 year's warranty, operation & maintenance period, the contractor Will have to make all necessary arrangements for satisfactory operation, maintenance and performance of the Power Plant.
P. Rectification of all the defects developed in the Solar PV Power Plant during warranty, and maintenance period shall have to be done by the contractor promptly, at the most within 10 days from the date of receipt of complaint.
Q. During Warranty, operation and Maintenance period, the contractor shall have to submit an annual performance & functionality report.
R. For proper functioning and maintenance of Solar Power Plant, contractors shall have to appoint at least one representative who has proper knowledge about the functioning of the solar plant for technical assistance on behalf of the contractor with whom the Tendering Authority can contact during the contract or warranty period.
During the warranty, operation& maintenance period, the Tendering Authority will have all rights to cross check the performance of the Solar PV Power Plant, the Tendering Authority may randomly pick up its components to get them tested at Govt. / MNRE approved any test centre. If during such tests any part is not found as per the specified technical parameters, the Tendering Authority will take the necessary action to recover the losses and to black list the firm and the same may be communicated to MNRE and other nodal agencies. The decision of the Tendering Authority in this regard will be final and binding on the contractor.

Item Wise Technical Specifications

Sl No.	Items	Specifications
Major Equipments/Components		
1	Solar PV module	• Bifacial module with min 540-545W • PV Module type: Mono-crystalline • PV Module Parameters: ➢ Maximum Power Rating: 580 (or above) Wp ➢ Rated Power Current: 13 (or above) A ➢ Rated Power Voltage: 40 (or above) V ➢ Short Circuit Current: 14 (or above) A ➢ Open Circuit Voltage: 47 (or above) V • Electrical Conversion Efficiency should be min 23% (top side efficiency should be min 19% and linear annual degradation of efficiency should not be greater than 0.55%)
2	Inverter	• Hybrid Inverter with rated capacity 20 KW • Input voltage: DC 360 V, AC 3 phase 380 – 440 V • Output voltage range: 3 phase 415 V • Frequency: 50 Hz

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		• Efficiency: 96%
Structure		
3	Mounting Structure, Mid Clamp, End clamp, J bolt, Fastener	Mounting Structure - Hot dip galvanized material
Electrical Components & Accessories		
4	Cable Requirement	DC cables, AC cables, MC4 connector
5	Battery	Rated Capacity: Min 15 kVAh
6	Junction Box, MC4 Connector, PVC conduit	
Protective Arrangement/Accessories		
7	Lighting arrestor	1 no.
8	Earthing	• 3m 50 mm dia Earthing Pits with BFC • Chemical Earthing
9	Earthing Cable	6 sq.m Cu earthing cable
10	Earthing strip	25x3 mm Earthing strip
11	Net-meter	1 no.
12	Array Junction Box, ACDB, DCDB	• Should be Provided in suitable numbers
13	Cable trays, ties, lugs, ferrules, glands, etc	• Should be Provided in suitable numbers (number of rows)
14	Weather monitoring system	
Designing & Other Services		
15	Supervision	
16	Civil & Electrical Works	
17	Services	
18	Other Services	• Surface (roof) facing the bottom side of PV modules should be painted in Silver/white with the objective to achieve maximum solar radiation reflection • Sprinkler facility with proper water drainage system to be provided for cleaning of the PV modules
Proposed Capacity of the plant		15 KW (Minimum)

D S SYSTEMS PVT LTD
GUWAHATI-781034

ASSAM SCIENCE AND TECHNOLOGY UNIVERSITY

Tetelia Road, Near Assam Engineering College, Jalukbari, Guwahati-781013, Assam

ASTU/energy/AICTE-GAINER-SOLAR/2022/74/ 10287 Date: 11.07.2023

Compliance/Satisfactory Report on Handing Over, Performance ratio Testing and Commissioning of the Hybrid Solar PV Power Plant

TENDER REFERENCE NO.: ASTU/ASTU/energy/AICTE-GAINER-SOLAR/2022/74/7931 dated 12.01.2023

WORK ORDER REFERENCE NO.: ASTU/energy/AICTE-GAINER-SOLAR/2022/74/8548 dated 24.02.2023

Recommendations:

The undersigned have inspected the site of installation of the work and observed that the work undertaken by 'JS Systems Pvt Ltd' is complied and in accordance with the various requirements of the above mentioned tender, work order and agreement. The installed system is found to be working satisfactorily as per the 'performance ratio test' conducted today in our presence. The following recommendations/observations are put forwarded for kind reference and needful action:

1. It may be recommended to replace the payment of the firm as per the payment terms in the agreement of the Tendering Authority with the firm and also as mentioned in the tender and work order. However, the vendor should provide sufficient documents on confirmation (from the concerned authority) towards Net-Meter Installation.
2. The commissioning of the plant (as per Annex II of the tender) and handing over (as per Annex III of the tender) may be completed.
3. The work competition report, in the prescribed format of APDCL for Net Meter Installation, may be signed by the competent authority of the university
4. As informed, the following Grade IV employees of the university are trained regarding operation of this plant: (i) Mr. Kamal Das & (ii) Mr. Mormeswar Das. These two (2) persons may be entrusted with the responsibility towards maintenance of the plant.

Names & Designations	Full Signature with date
1. Er. Monoranjan Thakur, Chief Engineer, ASTU, Guwahati	11/7/2023
2. Dr. Plaban Bora, Project Coordinator and Assistant Professor, Department of Energy Eng., ASTU	11.07.2023
3. Mr. Basanta Barman, Project Co-Coordinator and System Admin, ASTU	11.07.2023

MONEY RECEIPT

DS SYSTEMS PVT. LTD.

Registered Office : Sundarpur, R.G. Baruah Road, Guwahati - 781 005
Corporate Office : Odalbakra, Near Sabitri Bharali ME School, Guwahati-781034, Assam
Phone : 96780-08031 / 96780-08032, Fax : 0361-2470158

No. 413 Date 16/8/23

Received with thanks from AS+U, Guwahati

for SOLAR PLANT *a sum of*

Rupees Thirteen Lac Ninty Eight Thousand Seven hundred Ninety Two only

By Cash/Cheque/Draft No. " 439020 "

Rs. 13987921/-

For DS SYSTEMS PVT. LTD.