

DADI INSTITUTE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institute)



Approved by A.I.C.T.E & Permanently affiliated to JNTU GV
Accredited by NAAC with 'A' Grade and Inclusion u/s 2(f) & 12(B) of UGC Act

An ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 Certified Institute.

NH-16, Anakapalle - 531002, Visakhapatnam, A.P.

Website: www.diet.edu.in, 9963993229 E-mail: principal@diet.edu.in

CRITERIA- 7

7.1.2 - The Institution has facilities for alternate sources of energy and energy conservation: Solar energy Biogas plant Wheeling to the Grid Sensor-based energy conservation Use of LED bulbs/ power-efficient equipment

1. Solar energy

As an initiative to adopt renewable energy generation, the Institute has encouraged the students of electrical engineering department to work on the real time project of illuminating street lights in the campus with Solar Energy. As a part of this, the department of EEE at DIET collaborated with EFFISOL Energy Solutions Pvt. Ltd to erect an Off Grid solar PV system with an installed capacity of 2kVA MPPT Technology based solar inverter, six solar panels rated at 1.92kwp and 08 solar batteries with 150Ah rating to meet the street light illumination needs at college premises.

An off grid 2 kwp solar-systems designed and implemented for illumination of LED Street lights in college campus. In order to compute the off-grid solar system components, solar data for Visakhapatnam district is obtained from NREL web site. The design was done based on the shortest day of the year. The solar system set to supply load current for 12 hrs during night time automatically with digital programmable timer.

Project mainly focused on various design aspects like PV sizing, battery sizing and MPPT based inverter sizing also required protection like DC and AC side earthing along with lightning arrester followed by cable sizing. In this computation the shortest day of the year has been assumed. Although the total design is acceptable from engineering point of view, from economical view of the total cost of system is higher than that has been designed for summer days.



Solar Panels provided at the entrance of the Institution



Dadi Institute of Engineering & Technology

(Approved by A.I.C.T.E., New Delhi & Affiliated to J.N.T.U.K., Kakinada)

NAAC Accredited Institute

An ISO 9001 : 2008, ISO 14001 : 2004 & OHSAS 18001 : 2007 Certified Institution

N11-5, Anakapalle, Visakhapatnam-531002, A.P.

Ph. : 08924-221111,22,33, 9963981111 / www.diet.edu.in / e-mail : info@diet.edu.in

Lr. No.131 Engg./P.O./2018

Date: 10-10-2018

To

EffiSol Energy Solution Pvt.Ltd.
#16-200,
Pralhadapuram,
Visakhapatnam-530 027.

Dear Sir,

Sub: Purchase Order for 2KW Off-Grid Solar PV System – Reg.

Ref: EFFISOL/Q/2018/06/2, dated 08/06/2018.

With reference to your Proposal cited above, I am herewith placing the Purchase order for 2KW Off-Grid Solar PV System.

S. No	Item Description	Qty	Unit Price	GST	GST Amount	Amount
1.	Off-grid Solar PV System with 2 KVA MPPT Technology Based Soar Inverter, 1.92 kWp Solar Panels and 8numbers of 150 Ah Solar Batteries along with required materials for installation. Automatic Timer Controller.	1	2.07.000	5 %	10.350	2,17,350

(Rupees Two lakhs seventeen thousand and three hundred fifty only)

We are herewith paying an advance amount of Rs .1,00,000 /- through RTGS.

Terms & Conditions:

1. The price is inclusive of all taxes
2. The equipment shall be under warranty (10 years Modules) (3 years for Inverters) (5 years for Batteries).
3. 50 % advance along with purchase order.
4. The equipment shall be delivered at the college address within 10 days.
5. Remaining payment will be done after commissioning of Solar System.

Thanking you,



Yours Sincerely,


(DADI RATNAKAR)
Correspondent

Effisol Energy Solutions Private Limited
 #16-200, Main Road Prakhiladapuram, Prakhiladapuram, Visakhapatnam Andhra Pradesh 530027
 GSTIN: 37AAEECB4349M1Z8

TAX INVOICE

Invoice No: EFFISOL/18-19144
 Invoice Date: 08/11/2018

Place of Supply: Andhra Pradesh (37)
 Mode/Terms of Payment: Credit
 Terms of Delivery: Ex-Works

Bill To:
 Dadi Institute of Technology
 National Highway 5, Anakapalle, Visakhapatnam - 531002, Andhra Pradesh, India
 Contact Person: Mr. Dadi Ratnakar
 Phone: _____

Ship To:
 Dadi Institute of Technology
 National Highway 5, Anakapalle, Visakhapatnam - 531002, Andhra Pradesh, India
 Contact Person: Mr. Dadi Ratnakar
 Phone: _____

#	Item & Description	HSN/SAC	Qty	Rate	CGST	SGST	Amount
1	2 kW Off-grid Solar PV System Components 1. Solar PV Modules: 320 Wp & Nos 2. 3 kVA MPPT technology based off-grid inverter 3. Batteries: 8 Nos of 150 Ah (C-10 rating) Solar Batteries 4. Mounting structure of mounting structure 5. DCDB and ACDB for protection and maintenance of solar inverter and solar panels, earthing for DC side 6. BMS Cable: 12mm MM or above for wiring from floattop to inverter Other connection accessories 7. Automatic circuit controller	85	1.00	185,800.00	2.5%	2.5%	1,95,600.00
Sub Total							1,95,600.00
CGST (2.5%)							4,890.00
SGST (2.5%)							4,890.00
Total							2,05,380.00
Payment Made							1,10,000.00
Balance Due							Rs-1,05,380.00

Total in Words:
 Rupees two lakh five thousand five hundred thirty eight paise

Thanks for your business.

Company Bank Account Details:
 Effisol Energy Solutions Pvt. Ltd.
 AC No: 3828215018 BSR Code: SEIN0001611 State Bank of India

Terms & Conditions:
 1. Warrantee according to manufactures description
 2. Goods once sold will not be taken back.
 3. All disputes are subjected to Visakhapatnam Jurisdiction only
 4. Goods remain property of Effisol until full payment is done

D. Ratnakar
 Authorized Signature

Dadi Institute of Engineering & Technology
 (Approved by A.I.C.T.E., New Delhi & Affiliated to J.N.T.U.K., Kakinada)
 NAAC Accredited Institute
 An ISO 9001:2008, ISO 14001:2004 & OHSAS 18001:2007 Certified Institution
 NH-5, Anakapalle, Visakhapatnam-531002, A.P.
 Ph: 08924221111, 22,33, 9963981111 / www.dadi.edu.in / e-mail: info@dadi.edu.in

Lr. No.131 Engg.P.O./2018 Date: 10-10-2018

To:
 Effisol Energy Solution Pvt.Ltd.,
 #16-200, Prakhiladapuram, Visakhapatnam-530 027.

Dear Sir,

Sub: Purchase Order for 2KW Off-Grid Solar PV System - Reg
 Ref: EFFISOL/O/2018/06/2, dated 08/06/2018.

With reference to your Proposal cited above, I am herewith placing the Purchase order for 2KW Off-Grid Solar PV System.

S No	Item Description	Qty	Unit Price	GST	GST Amount	Amount
1.	Off-grid Solar PV System with 2 kVA MPPT Technology Based Solar Inverter, 1 x 2 kW Solar Panels and 8 numbers of 150 Ah Solar Batteries along with required materials for installation, Automatic Tether Controller.	1	2,07,000	5%	10,350	2,17,350

(Rupees Two lakhs seventeen thousand and three hundred fifty only)
 We are herewith paying an advance amount of Rs.-1,00,000/- through RTGS.

Terms & Conditions:
 1. The price is inclusive of all taxes
 2. The equipment shall be under warranty (10 years Modules) (5 years for Inverters) (5 years for Batteries).
 3. 50% advance along with purchase order.
 4. The equipment shall be delivered at the college address within 10 days.
 5. Remaining payment will be done after commissioning of Solar System.

Thanking you.

Yours Sincerely,
D. Ratnakar
 (DADI RATNAKAR)
 Correspondent

Effisol Energy Solutions Private Limited
 #16-200, Main Road Prakhiladapuram, Prakhiladapuram, Visakhapatnam Andhra Pradesh 530027
 GSTIN: 37AAEECB4349M1Z8

TAX INVOICE

Invoice No: EFFISOL/18-19144
 Invoice Date: 12/11/2018

Place of Supply: Andhra Pradesh (37)
 Mode/Terms of Payment: Credit
 Terms of Delivery: Ex-Works

Bill To:
 Dadi Institute of Technology
 National Highway 5, Anakapalle, Visakhapatnam - 531002, Andhra Pradesh, India
 Contact Person: Mr. Dadi Ratnakar
 Phone: _____

Ship To:
 Dadi Institute of Technology
 National Highway 5, Anakapalle, Visakhapatnam - 531002, Andhra Pradesh, India
 Contact Person: Mr. Dadi Ratnakar
 Phone: _____

#	Item & Description	HSN/SAC	Qty	Rate	CGST	SGST	Amount
1	Installation of 2 kW Off-grid Solar PV System	59	1.00	5,016.00	5%	3%	5,866.00
Sub Total							5,866.00
CGST (5%)							293.30
SGST (3%)							175.98
Total							Rs.11,759.85
Balance Due							Rs.11,759.85

Total in Words:
 Rupees eleven thousand seven hundred fifty-nine and eighty-eight paise

Thanks for your business.

Company Bank Account Details:
 Effisol Energy Solutions Pvt. Ltd.
 AC No: 3828215018 BSR Code: SEIN0001611 State Bank of India

Terms & Conditions:
 1. Warrantee according to manufactures description
 2. Goods once sold will not be taken back.
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D. Ratnakar
 Authorized Signature

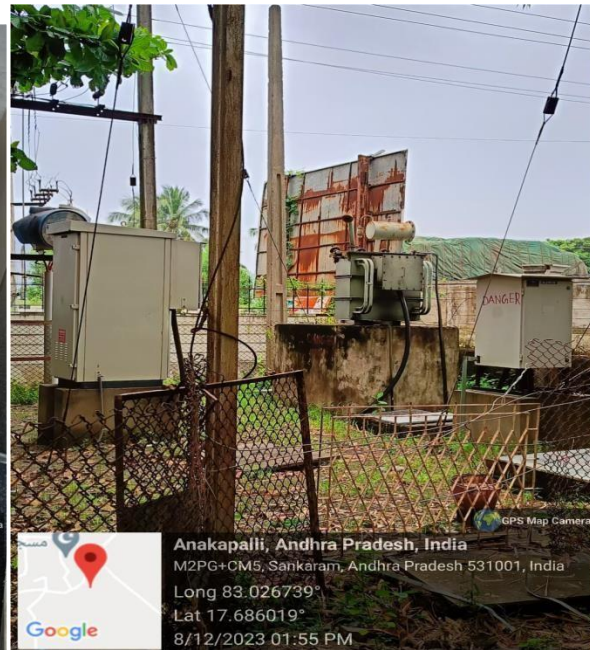
Bills of Solar Panel System Installed in the Institute

2. Wheeling to the Grid

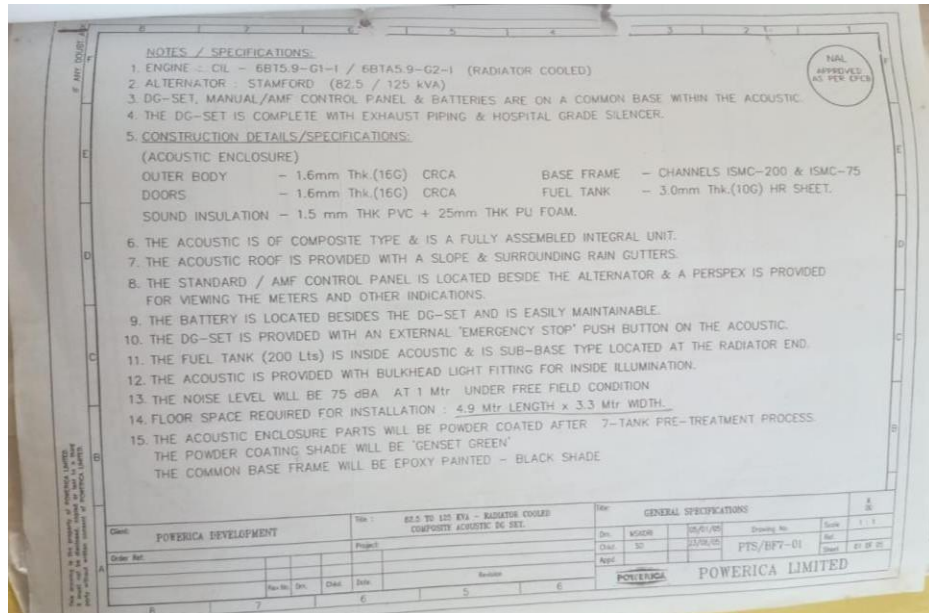
160KVA Transformer withdrawing 100KVA

Specification of the grid in the Institution

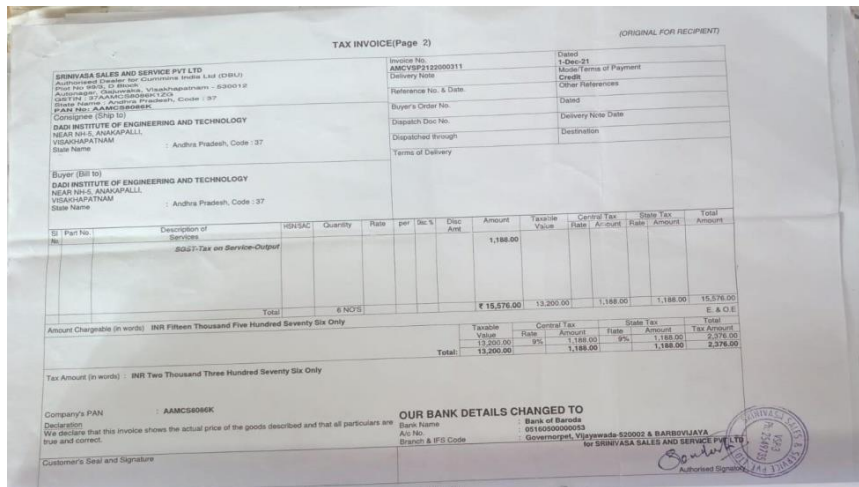
S.No.	Description	Specification
1	Eastern Power Distribution Company of Andhra Pradesh Ltd No Load Voltage	11KV[HV] 433V[LV]
2	Amperes	8.4A[HV] 213.4A[LV]
3	No. of Phases	03
4	Frequency	50Hz
5	Type of Cooling	ONAN Vector Group DYN 11
6	Volume of Oil	260 Liters
7	Core & Winding Weight	400Kgs
8	Total Weight	850Kgs
9	Maximum Temperature rise in Oil	45°C
10	45°C Percentage Impedance Volts	4.5%
11	Power Factor	0.97
12	Load Factor	5%



Devices installed for Wheeling to the Grid and Transformer at South-East portion of the Institution



Instructions and notes regarding specifications and construction details of the wheeling to the grid



Invoice of the wheeling to the grid

3. Sensor Based Energy Conservation

At DIET, the concept of Home Automation is introduced to reduce the usage of power through different mechanisms in which the PIR sensor plays a key role which detects if any movement occurs in specified range, in case of any motion detected; the sensors give the signal of motion to the microcontroller.

The ARDUINO UNO is the micro controller used to process the data in this model, where the data pins in the controller are used to recognize the signal from the PIR sensor, if the signal received from PIR is high, the output device will be switched ON and if the signal received from the PIR is low tenth output device will be switched OFF. RELAY is used to protect the electronic devices from the high-power AC supply and act as a switch.

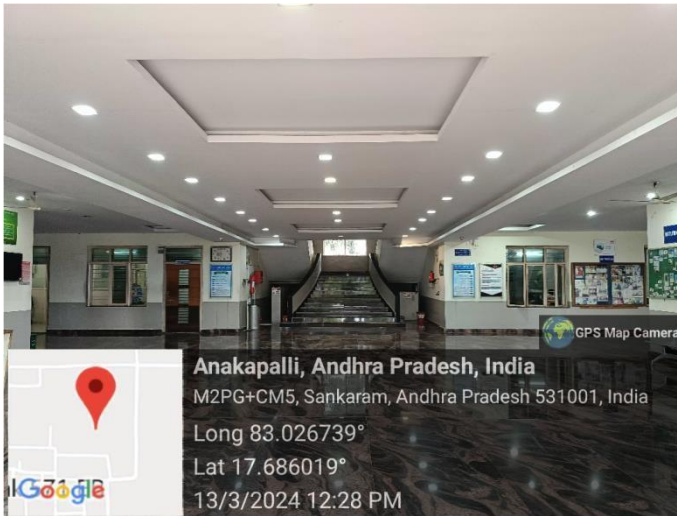
Also, an Android Application has been developed where, through the Bluetooth from mobile control signals are relayed through wireless medium to Bluetooth HC-05 Module. From Bluetooth Module control signals are relayed to Adriano Micro Controller where it controls the output pins. Output in connected to Relays (Magnetic Switch)



Sensor PIR

4. Use of LED Bulbs/Power Efficient Equipment

DIET is illuminated with Environmental friendly LED [Light Emitting Diode] Lights all over the campus with ratings as per the required luminous intensity at a given location. The details of exterior and interior lighting are provided below:



LED Lights in the campus

External Lighting:

External Lighting:

List of LED Lights used for External Lightings

S.No	Description	Count of LED Bulbs
1	40W LED Lights at the Main Gate Cost-Rs.4000 each	4
2	120W Solar based Lights Cost-Rs.8000each	9
3	24W - Street Lights - Ground Cost-Rs.2500 each	40
4	80W - Ground Cost-Rs.6000 each	9

Interior Lighting:

List of LED Lights used for Interior Lightings

S.No	Description	Count of LED Bulbs
1	24W - Ground Floor Corridor Cost-Rs.2500 each	30
2	12W - Ground Floor Corridor Cost-Rs.120each	60
3	15W - Ground Floor Corridor Cost-Rs.600each	10
4	1 st Floor to 5 th Floor - 10 LED Lights per each floor Cost-Rs.120 each	50
5	LED Tube Lights of 24W are placed at Admission Office, Exam Cell, Principal Office, Diploma Office, SeminarHall2, Music Room, Library and Chairman Office with Cost-Rs.300each	45
6	Seminar Hall lighting - 40W Flood Lights 4000each	2
7	100W Lights costing Rs.5500 each	2


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