

**DCT's
Dhempe College of Arts and Science
Panaji, Goa**

Quality Index Factor Criterion 7.1.2

Facilities for Alternate Sources of Energy and Energy Conservation Measures

1. Our initiatives to harness Solar Energy

Report on Solar Energy Utilisation



**DCT's
Dhempe College of Arts and Science
Panaji, Goa**

Report on Solar Energy Utilization

As Goa Government promotes generation and use of clean and green power by harnessing renewable forms of energy. It also promotes private sectors participation in the development of solar PV power and other renewable forms of energy .Government has also constituted bodies like .Goa Energy Development Agency which focuses on promotion of solar, thermal and hybrid based energy efficient devises. To fulfil these needs Goa government is encouraging people, education institutes, industries to use solar based applications to generate electricity so that the money which they are paying to neighbouring states can be utilised in for other development in the state.

To support this state mission during academic year 2017-18 Dr. Swati Pawar and Dr. Miskil Naik, faculty from Physics Department Dhempe College undertook a three-year project of 5 lakhs sanctioned by Directorate of Science & Technology titled” **Design and development of a photovoltaic and human power hybrid energy system for varied applications**” In the present work it is planned to fabricate the hybrid energy system in the student gymnasium. The idea would be to convert any existing peddling system to an energy generator unit through associating a dynamo generator. The DC electrical output would be clubbed with the Photovoltaic output and then fed to the battery storage system.

As one of the requirement for completion of this project following items for Solar PV installation in the month of January 2020 were procured.

1. Solar panels two in number of 330Watts
2. Inverter 1KVA
3. Batteries two in number of 100Ah

With the above configuration the output generated is connected to the corridor LED tube lights (16 in number). These tube lights runs in the night around 7-8 hours.


Dr. Miskil Naik


Dr. Swati Pawar

Bill of Solar Power Grid system

TAX INVOICE

M/S JN SOLAR POWER LLP Shop no. 5, Krish Residency, Malbhat, Margao, Goa 403601 GST:30AAPFJ1650A1ZZ Contact:9370208917/9834082924 Email:jnsolarpowerllp@gmail.com	Invoice No. 2019-007	Dated 30-11-2019
	Delivery Note	Mode/Terms of Payment Immediate
	supplier's Ref.	other Reference(s)
Buyer DCT's Dhempe College of Arts and Science, Miramar, Goa	Despatch Document No.	Delivery Note Date
	Despatched through	Destination
	Terms of Delivery	

Sl. No.	Description of Goods	HSN/SAC	GST %	GST Amount	Quantity	Unit Price	Amount
1	0.66 KW OFF GRID System, 1KV Inverter,330 Wpx2 Nos. 100AH x2 nos and Accessories	85414090	5%	4371	1 Set	87429	87429
	Total Amount						87429
	Output CGST @2.5%						2185.5
	Output SGST @2.5%						2185.5
	Grand Total				1 Set		91800

Amount Chargeable (in words): **Ninety One Thousand Eight Hundred Rupees Only**

Assessable Value	<u>Tax Amt</u>
87429	4371

Company's PAN:AAPFJ1650A

Declaration

We declare that this Invoice shows the actual price of the goods described and that all particulars are true and correct

Company's Bank Details

Bank Name:HDFC Bank A/c
 A/c No :50200039655272
 Branch &IFS Code:Rangavi Building,Margaon & HDFC0000037




Customer's Seal and Signature	for M/S JN SOLAR POWER LLP Authorised Signatory
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SUBJECT TO MARGAO JURISDICTION
 This is a Computer Generated Invoice



2. Biogas Plant

Bill of the Bio Digester

		<h1>TAX INVOICE</h1>				
<small>ISO 9001:2008, ISO 14001:2004, OHSAS 18001:2007 CERTIFIED</small>		GMI Zarhak Moulders Pvt. Ltd. S-91, Phase II-C, Verna Electronic City, Verna Goa - 403 722, India		DUPLICATE FOR TRANSPORTER INVOICE NO.: INV-18/03666 DATE OF REMOVAL: 27-10-2018 TIME OF REMOVAL: 10:04		
GST No. 30AACCG0556G1Z6 CIN: U25209GA1995PTC001777		P.O. NO.:				
Sr. No.	Description of Goods	HSN CODE	Identification Marks	Total Quantity	Basic Value Per Unit (Rs)	Total (Rs.)
1	Biogas Tank	84051090	-NA-	1.00	20521	20521
2	Biogas Funnel	84051090	-NA-	1.00	7400	7400
					Transport	650.00
					Others	0.00
					CGST 2.5 %	714.28
					SGST 2.5 %	714.28
					Total	30,000.00
GST No.		Transporter: GA-08-V-9892				
BILL TO		SHIPPED TO				
MR. COSTABIR OVER THE COUNTER ZARHAK MOULDERS PVT LTD.-VERNA Phone: 2783958 / /		Manjiri Barve Dhempe College of Arts and Science Miramar 9822121834/8322461166				
		For GMI ZARHAK MOULDERS PVT. LTD.  AUTHORIZED SIGNATORY				
<small>* If this Bill is not paid within 15 days 18% interest will be charged. Any Disputes will be subjected to Goa Jurisdiction. Note: Please dispose of scrapped products, samples and packing material after intended use to recyclers who are approved by Pollution Control Boards of the respective States.</small>						

3. Use of LED Bulbs/Power Efficient Equipment:

Report of LED usage

Report of LED usage

In order to achieve one of our objectives of reducing energy consumption with cost effectiveness, it was decided to replace some of the conventional tube lights in the library reading room with LED tubes which is considered to be a better option compared to conventional tube lights where the energy consumption is more. For this purpose, quotations were brought in order to choose the best option available. The decision was taken after discussion with the higher authorities to purchase Surya LED Tube lights as it was the best option available compared to other brands.

Following table gives the comparative picture of three brands.

BRAND	WATTAGE	LIFE	ENERGY SAVINGS	COST PER UNIT INCLUDING VAT
PHILIPS	20	25000	UPTO 50%	RS.1259/-
SURYA	18	25000	50%	Rs.888/-
SYSKA	16	25000	UPTO 50%	Rs.922/-

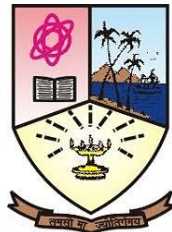
The above table reveals that Surya LED tube light is the most efficient and cost-effective option. It has life covering of 25,000 hrs with two years warranty. These LED lights will help us save approximately 50% energy over Fluorescent Tube Light. It doesn't carry Ultra Violet Rays which normal Fluorescent Tube Lights. These LED's are Eco friendly, thus helping us to achieve our mission of conserving and protecting environment and at the same time reducing the energy consumption.

One of the criteria for opting Surya LED's over other brands is also that it will fulfil the dream of our Honourable Prime Minister of '**Make in India, made in India mission**' thus ensuring to promote Indian brand over other foreign brands.



Dr. Shilpa Samant

Latitude: 15.480089
Longitude: 73.813417



DCT's

Dhempe College of Arts & Science
Miramar-Goa

7.1.2 Geotagged photographs of alternate sources of energy and energy conservation measures

Biogas Plant



Solar Panels



LED Lights



Latitude: 15.482479
Longitude: 73.810359
Elevation: 13.34m
Accuracy: 13.1m
Time: 07-02-2020 12:29
Note: led biotech