



ADITYA COLLEGE OF ENGINEERING

Approved by AICTE, Permanently Affiliated to JNTUK & Accredited by NAAC

Recognized by UGC under Sections 2(f) and 12(B) of UGC Act, 1956

Aditya Nagar, ADB Road, Surampalem - 533 437, E.G.Dist., Ph: 99631 76662.

Alternate sources of energy and energy conservation measures.



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7.1.2- The institution has facilities for Alternate sources of energy and energy conservation measures.

Aditya College of Engineering is committed to utilize the alternate source of energy and energy conservation measures

- College installed solar energy plant to generate renewable energy for fulfilling its energy requirements.
- College installed biogas plant to generate energy form decomposing waste form college canteen and the hostel.
- Sensor based project room is installed in Ramanujan bhavan
- LED bulbs are used in various places in college to reduce the energy consumption and full-fill lighting needs.

The following alternative sources of energy are available in our campus

- **Solar energy plant**
- **Biogas plant**
- **Wheeling to the Grid**
- **Sensor based solar street lights**
- **LED bulbs to reduce energy consumption**

The following attachments are the geo tagged images of the above mentioned facilities.



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Solar Energy

Aditya College of Engineering is committed to utilize the alternate source of energy and energy conservation measures by using solar power plant. The institution met 56% of its total requirement of power consumption by alternate source of energy i.e. renewable sources.

General	
Details	
Total Capacity of the Plant	500KWp
Roof used for the plant	20,000 Sq-Ft or 2,000 Sq-Mtr
Average Sun Irradiance	4.89 KWh/Sq-Mtr/Day
Expected Generation/Day	1000 to 1200 Kwh
Solar Panels	
Details	
Total no. of panels	612 No's
Capacity of each panel	325 Wp
Make	Vikram Solar
Technology & no. of cells	Polycrystalline, 72 cell
Type of Busbar system	4 Busbar series type
Working voltage	1000 VDC
Type of connection of panels	In Series
Panel Efficiency	18.5%
Working Temperature Range	-40 ^o c to 85 ^o c
Panel Dimensions	1956x992x35.2 mm
Weight of each panel	22 Kgs
Inverter Details	
Total no. of Inverters	4 No's
Capacity of each Inverter	50 KVA
Type of Inverter	Solar ON-GRID
Make	ABB
Technology used	Maximum Power Point Tracking (MPPT)
No. of MPPTs/Inverter	3 No's
Weight of Inverter	125 Kgs



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POWER BIL COMPARATIVE STATEMENT AFTER INSTALLATION OF SOLAR PANELS

S.NO	Month	Total consumption in KWH	From Grid in KWH	From solar in KWH	Power bill in Rs
1	Jan-21	30375	67149	36774	174925
2	Feb-21	42034	70617	28583	310129
3	Mar-21	51736	68290	16554	617817
4	Apr-21	48217	62841	14624	548441
5	May-21	20542	66012	45470	168651
6	Jun-21	17883	57605	39722	167072
7	Jul-21	28992	48100	19708	188548
8	Aug-21	35719	48700	12981	452304
9	Sep-21	38866	53082	14216	455491
10	Oct-21	41593	61489	19896	403051
11	Nov-21	34907	46706	11799	534080
12	Dec-21	39444	58616	19172	466931



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Solar Panel on roof top of Newton Bhavan



Solar Panel on roof top of James Watt Bhavan



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Solar Panel on roof top of Ramanujan Bhavan



Solar Panel on roof top of Ramanujan Bhavan




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BIOGAS PLANT

The biogas plant at Aditya college of Engineering was an anaerobic digester which has a capacity of 2000 Ltr. The digester works under anaerobic conditions. The feed of the digester was Kitchen waste, food waste and cow dung. The daily feed of the digester was 150 kg and the retention time is 15-20 days. The salient features of the digester are its bubble gun technology (generating gas bubbles) for mixing the slurry of the digester. Another important feature of the digester is it works under constant operating temperature of 35°C. The feed (kitchen waste/food waste) is crushed into small fine pieces and fed into the digester through Peristaltic Pump. Part of the gas produced from the digester was used to generate bubbles with bubble gun. Solar water heating was used for the hot water circulation inside column of the digester to keep temperature of the digester constant. The biogas produced from the digester was taken by the water ring compressor and sent to the water gas separator where the moisture in the biogas was removed and the dry biogas was sent to the storage balloon.

Biogas technology is about capturing the gas that results from the anaerobic fermentation of biomass. The plant uses the natural processes of anaerobic digestion to produce biogas from animal waste or Kitchen waste. Biogas is a mixture of gas produced by methanogenic bacteria while acting upon biodegradable materials in an anaerobic condition. Biogas is mainly composed of 50-70% methane, 25-35% carbon dioxide and trace gases such as hydrogen sulphide, water vapor, nitrogen and hydrogen. Biogas is about 20% lighter than air and has ignition temperature in the range of 6500 to 7500 C. It is odorless and colorless gas that burns with clear blue flame like that of LPG gas. Its calorific value is 20000 kJ/m³ and burns with 60% efficiency in a conventional biogas stove.

Biogas feedstock can be sourced from any biodegradable materials such as kitchen waste, municipal waste and animal waste such as cows. The gas production varies from one feedstock to the other as well as the speed of digestion. A biodigester is a container that receives a daily input of farm waste, and within which the manure mixed with water will be fermented, producing methane-rich biogas, as well as a natural and ecological fertilizer. The biogas is a mixture of different gases (Methane, carbon dioxide, oxygen, sulphur etc..) produced by bacteria in an anaerobic environment and can be used as a source of renewable energy.



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BIOGAS PLANT AT RAMANUJAN BHAVAN CANTEEN



BIOGAS PLANT AT RAMANUJAN BHAVAN CANTEEN



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WHEELING TO THE GRID

The Wheeling to the Grid installed on roof top of each building where solar panels are installed at Aditya college of Engineering. The institution is wheeling the power generated from the rooftop solar panels to the distribution grid. The units shared with grid are reduced from the actual consumption.



Wheeling to The Grid -Meter Placed On Top Of Ramanujan Bhavan



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SENSOR-BASED ENERGY CONSERVATIONS

Aditya College of Engineering is committed to utilize the alternate source of energy and energy conservation measures by using solar power plant. The institution met 56% of its total requirement of power consumption by alternate source of energy i.e. renewable sources.

Aditya College of Engineering is committed to follow the Green Campus initiatives as a College policy. It protects its own environment with its green campus initiative and keeps pollution free campus. Environment development is its basic work with the educational policies implemented on the campus. Environmental conscious administration, the management and the students of the college look after the environment carefully. The core of the initiative is a strategic plan to be used as a reference for staff, faculty and students.

Five (5) Sensor Based lights and Five (5) sensor based fans are used in the campus to add to the pre-existing multiple energy conservation methods. Sensor based lights saves energy by automatically putting off the lights when not in use. This not only saves energy but it also acts as a security light to keep the campus safe. The institute implements Day-Night sensor based street 100W lights within the campus. 60W and 40W Sensor Based Street lights attached with solar panels are also implemented in the campus. The power factor is the measure of effective usage of electrical power. There will be the excess power consumption, if the power factor is less than unity. The implementation of Automatic Power Factor Control panel reduces the power consumption, losses in the power equipments, greenhouse gases and electricity bills.



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Sensor based equipment installed in Ramanujan bhavan



Sensor based equipment installed in Ramanujan bhavan



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LED BULBS

Aditya College of Engineering has a policy of employing LED lights throughout the campus. The Institute initiates the implementation of replacing all the lights with LEDs from administrative block. The entire block is lit by LED light. All the lights of central library in the ground floor is replaced with LED lights.

In library consists of 130 LED panels with 36W LED lights in each panel. Total power of 4.68kW for this is derived from solar panels. The first floor and second floor has 180 LED panels with 36W LED lights. The total power of 6.48kW for this is also supplied from solar power. 25kWp solar power plant is erected on the roof top of an administrative block to power the entire block.

Initiatives were taken to bring awareness on the use of energy efficiency among the students. Sign boards are placed on the campus and awareness programs are also conducted to impart the importance of energy efficiency and energy conservation among students. The institute implements, the alternate source of energy usage in boys hostel and girls hostel for providing hot water for bathing. 40 solar water heaters are installed on the roof top of hostels. The total power capacity of water heater is 72kW each.

The institute also implements battery vehicle service for in campus transportation. Aditya College of Engineering has 1000KVA HT power supply from Andhra Pradesh Electricity board. The institute has the backup alternate capacity of 1080KVA. Apart from this it also has another alternate backup facility through UPS of more than 100KVA for computing.

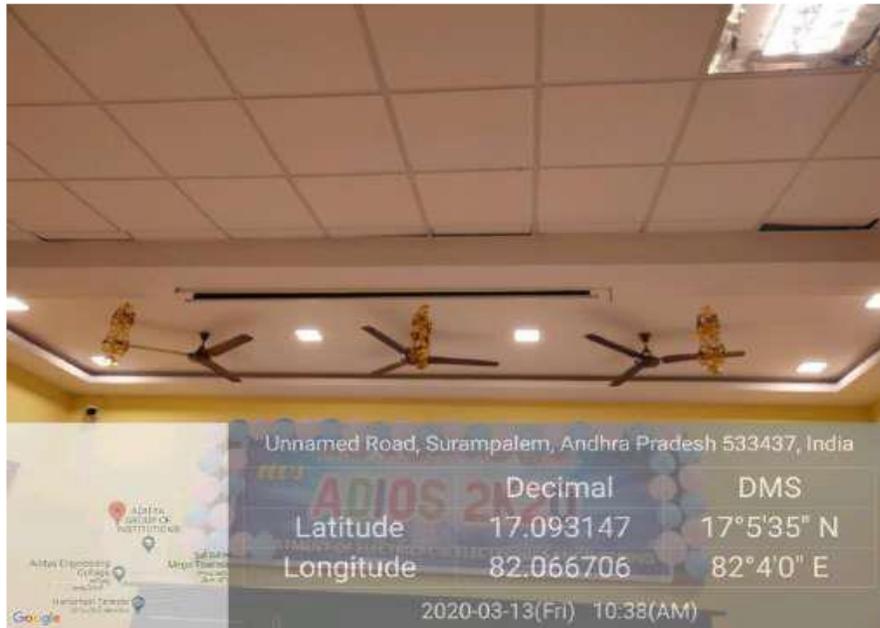


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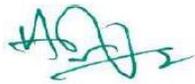


LED bulbs in Seminar Hall



LED bulbs in Seminar Hall




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LED bulbs in Labs



LED bulbs in Labs



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