

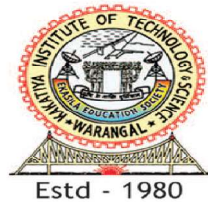
**Kakatiya Institute of Technology & Science :: Warangal**

**( Sponsored by Ekasila Education Society )**

## **Energy Audit Report**

**of 2021 – 2022**

**1<sup>ST</sup> April 2021 To 31<sup>st</sup> March 2022**



**KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE**

**Opp. Yerragattu Hillock, Hasanparthi - Hanamkonda**

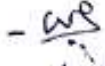




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## Preface

Data collection for energy audit of the Kakatiya Institute of Technology & Science, Warangal Campus was conducted by team for the period of 1<sup>st</sup> April 2021 to 31<sup>st</sup> March 2022. This audit was over sighted to inquire about convenience to progress the energy competence of the campus. To drop of energy utilization whilst cultivate or humanizing comfort, health and safety were of prime anxiety. This audit required to recognize the mainly energy proficient appliances. Besides, several each day processes concerning common appliances have been provided which facilitate sinking the energy expenditure. The energy audit survey was completed by Department of Electrical & Electronics Engineering, KITS. All data collected from each classroom, laboratory, every room. The work is completed by considering, how many tubes, fans, A.Cs, electronic instruments, motors, etc are in each room. How much was participation of each component in total electricity consumption.

### Members of the Committee

1. Head of Department , Electrical & Electronics Engineering - 
2. Dr. G. Rajendar , Associate Professor, Department of EEE. - 
3. Dr. L. Sudheer Reddy, Dean Planning and Execution. 
4. Sri. R. Prasad Raju, Asst. Project Officer. - 
5. Sri. T. Raju, Electroician. 



# Energy Audit Report

In this report, college electricity audit has been done considering laboratory instruments, Fans, Lights, air conditioners, Computers, Motors, etc. We have studied total budget of the college, total economic investment of college on the electricity and total generation of electricity from the solar electricity generation units. Also, we have studied total saving of electricity and money from solar generation and requirement of solar energy. Also, the exact contribution of bulbs, fans, computers, instruments, ac's , motors etc in the total requirement of electricity is studied. We studied all these mentioned things by collecting exact data form survey.



  
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## Data collection:

The required data is collected by project office and Department of Electrical & Electronics Engineering. According to survey following data is collected for FY 2021 – 2022

S.No	Name of the building	Energy Efficient Fans	Normal Fans	LED Tube Lights	Normal Tube Lights	CFL Lights	Air Conditioners	Fridge/ Geysers	Computer	Printer	Scanner	Xerox Machine	LCD Projector	Motors	Steet Lights	Total Watta
	WattageofEquipment	28	60	20	40	20	1000	1500	30	250	32	1000	300	750	90	
1	Block-I	4	190	49	195	0	32	2	357	9	3	1	7	25		
2	Block- II	14	65	180	29	42	71	2	303	14	11	0	6			
3	Block-III	5	170	55	194	0	22	2	200	7	3	0	5	150		
4	Block-IV	30	465	56	640	50	122	9	423	16	13	5	50	5		
5	Block-V	3	119	14	182	10	72	2	365	10	10	2	12	7		
6	Block-VI	173	0	209	5	8	6	6	42	7	2	0	19	20		
7	Workshop-II(New)		28	28				1						12		
8	SH-1(DwgHallBlock-6)		12		12			1								
9	SH-2 (L HBlock-7)		4		4											
10	SH-3(LHBlock-8)		12		12											
11	SH-4(HOSTELTVROOM)		10	6	12											
12	IndoorStadium		39	229	8	13	0	2	2	2	2	0	0	3		
13	Auditorium		20	14	2		4	1					2			
14	BoysHostelShedBlock-1		24	6	24											
15	BoysHostelShedBlock-2		24	6	24											
16	BoysHostelShedBlock-3		24	6	24											
17	BoysHostelShedBlock-4		24	2	24											
18	BoysHostelShedBlock-5		24	3	24											
19	OldDin Hall&Kitchen		12	2	24									3		
20	GirlsHostelBuilding		276	10	277									1.5		
21	BoysHostelBuilding-1		260	11	251			5								
22	BoysHostelBuilding-2		86	6	80	10		2						1.5		
23	StaffQuarters-I		24	6	36	6	6									
24	StaffQuarters-II		24	6	36	6	6									
25	ParkingShedatBlock-1			6												
26	ROWaterPlant&Parking		2	2	4			1						10		
27	Power&GeneratorRoom		6	4	6			1								
28	SecurityRoom		1		6			1								
29	StoresShed		6	2	6											
30	Dispensary		3	2	6											
31	Coffeday		1	2	4											
32	ProjectOffice&Xerox		4	2	9											
33	Bank/GuestHouseBldng		24	5	36		20	2								
34	STP Plant		3	6	6									25		
35	StreelLight														53	
36	Well&SumpMotors				12									55		
37	WaterSoftners													2		
38	LectureHallShed-1		5		5											
	Total Numbers	229	1991	935	2219	145	361	40	1692	65	44	8	101	320	53	
	<b>Total Wattage / HOUR</b>	<b>6412</b>	<b>119460</b>	<b>18700</b>	<b>88760</b>	<b>2900</b>	<b>361000</b>	<b>60000</b>	<b>50760</b>	<b>16250</b>	<b>1408</b>	<b>8000</b>	<b>30300</b>	<b>240000</b>	<b>4770</b>	<b>1008720</b>
	Total Wattage in a day	32060	597300	93500	443800	14500	722000	180000	152280	32500	2816	40000	151500	720000	23850	<b>3206106</b>
	Total Wattage / month	673260	12543300	1963500	9319800	304500	15162000	3780000	3197880	682500	59136	840000	3181500	15120000	500850	<b>67328226</b>
	Per month Wattage in kWH	673.26	12543.3	1963.5	9319.8	304.5	15162	3780	3197.88	682.5	59.136	840	3181.5	15120	500.85	<b>67328.23</b>

**Total power consumption of electrical equipment = 67,328 kW / month**



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## Power Consumption of Electricity Board

<b>Sr.No.</b>	<b>Month</b>	<b>Consumption Unit(kW)</b>
1	Apr-21	29993
2	May-21	15665
3	June-21	15838
4	July-21	17507
5	Aug-21	19322
6	Sept-21	30632
7	Oct-21	35970
8	Nov-21	49028
9	Dec-21	46323
10	Jan-22	29195
11	Feb-22	25310
12	Mar-22	51023
<b>Total Power Consumption in Yearly</b>		<b>3,65,806 kW</b>
<b>Average Power Consumption in Monthly</b>		<b>30,483 kW</b>



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**Total requirement of electricity, generation of electricity using renewable energy sources :-**

Power requirement met by renewable energy sources	Total power requirement	Renewable energy source	Renewable energy generated and used
28,624 units /Month	30,483 units/Month	Solar Power	45,439 / 28,624 units /Month

**Alternate Energy Initiaves:**

Percentage of power requirement of the institute met by the renewable energy sources

Formula =

$$\frac{\text{Power requirement met by renewable energy sources}}{\text{Total power requirement}} \times 100 = 39.36 \% (8\text{yrs})$$

Financial Year	Total Units from TSNPDCL	Units generated from Solar Plant	Total Units	Units exported to TSNPDCL	Units used from SCPP by KITSW	Total Units Consumed by KITSW	% of Power requirement met by renewable sources
2014-15	499692	130442	630134	0	130442	629031	20.74
2015-16	505601	301998	807599	30105	271893	777494	34.97
2016-17	451250	369932	821182	110891	267509	718759	37.22
2017-18	446262	593942	1040204	207842	386100	832362	46.39
2018-19	556128	531729	1087857	128674	403055	959183	42.02
2019-20	576690	530464	1107154	106412	424052	1000742	42.37
2020-21	197692	504627	702319	336869	167758	365450	45.90
2021-22	365806	545270	911076	201788	343482	709288	48.43
<b>Total</b>	<b>3599121</b>	<b>3508404</b>	<b>7107525</b>	<b>1122581</b>	<b>2394291</b>	<b>5992309</b>	<b>39.96</b>



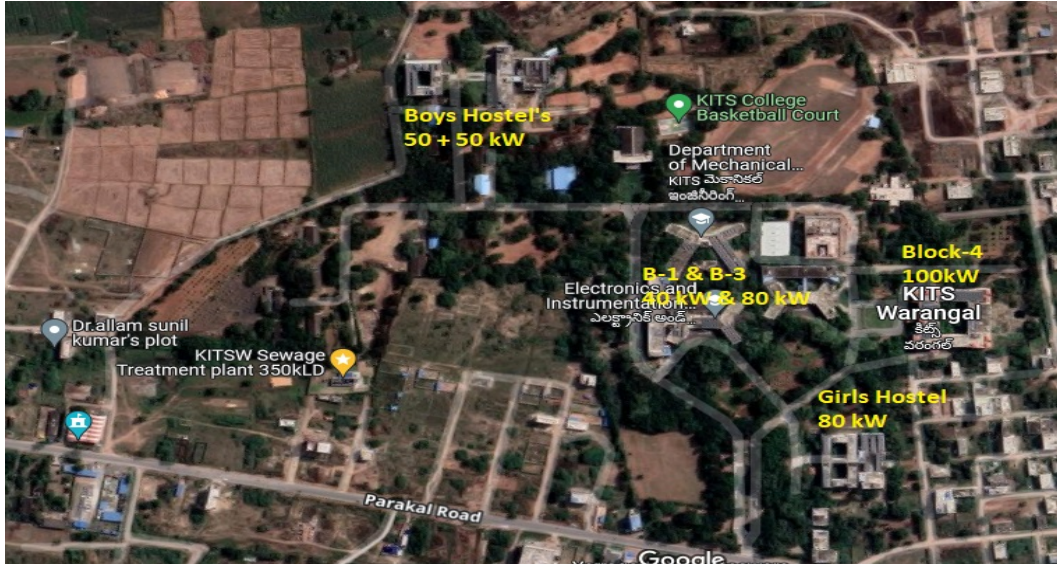
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## Photographs of Renewable Energy Sources-



**Fig- Roof Top Solar Energy Generation system**



**Fig. Birds Eye View of 400 kW Roof Top Solar Generation**

The Solar energy generation devices contain a solar panels and generation device generates about 1,494 units per day.

### **Conclusion:**

In conclusion, data generated in energy audit are useful for understanding the energy distribution and its utilization in college.. The college needs maximum 67,328 KW of electricity.

In other words college needs 45,439 Units/month and Solar energy generation device generate the only 28,624 units/month.

### **Recommendation:**

- 1) Replace all CFL Tube light using LED Bulb, to save morepower.
- 2) Replace CRT monitor using LED or LCD monitor.
- 3) Replace old fans with new fans
- 4) Replace old Re-Wound motors with new one.

### **Results and discussion:**

As far as the energy audit is concerned, its main concern is regarding educational institution. We have collected data by considering the tube light, fan, computer, printer, A.C, motors and instruments.. The total required energy is **67,328 KW** .Energy Consumption through all device is **28,624 Unit /Month** and Renewable source Generate **45,439 Unit /Month**.



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