

Krantiagrani G. D. Bapu Lad  
Mahavidyalaya, Kundal

Sangli- Maharashtra

# Energy Audit Report

January 2022



**Sharad Institute of Technology**  
**College of Engineering**

[www.sitcoe.ac.in](http://www.sitcoe.ac.in)

Energy Audit as per Guidelines of-



**BUREAU OF ENERGY EFFICIENCY**  
Government of India, Ministry of Power





Shri Shamrao Patil (Yadravkar) Educational & Charitable Trust's

# SHARAD INSTITUTE OF TECHNOLOGY COLLEGE OF ENGINEERING

An Autonomous Institute Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere

Approved by AICTE, New Delhi, Recognized by DTE, Government of Maharashtra

■ NBA Accredited Programmes ■ Accredited by NAAC with 'A' Grade ■ An ISO 9001:2015 Certified Institute

**Dr. S. A. Khot**  
Principal

**Shri. Anil A. Bagane**  
Executive Director

**Dr. Rajendra Patil (Yadravkar)**  
Minister of State, Govt. of Maharashtra  
Chairman

Ref No: SITCOE/EA/2021-22/ 442

Date: 03/03/2022

To,  
Principal,  
Krantiagrani G. D. Bapu Lad Mahavidyalaya  
Kundal

Subject: - Submission of Energy Audit Report

Dear Sir,

Attached please find a copy of the energy audit Report conducted by us in the month of January 2022 at Krantiagrani G. D. Bapu Lad Mahavidyalaya, Kundal.

Said Energy Audit has been conducted as per the guidelines laid down by MEDA and BEE.

Kindly acknowledge the receipt of the report

Thanking You.

Yours faithfully

**Dr. Sanjay Khot**

Accredited Energy Auditor (AEA-0312)

Principal

Sharad Institute of Technology

College of Engineering, Yadrav.



Report on

**ENERGY AUDIT**

Of

**Krantiagrani G. D. Bapu Lad Mahavidyalaya, Kundal**

Kundal, Dist. Sangli, Maharashtra.

Conducted by

**Dr. Sanjay A. Khot**

BEE Accredited Energy Auditor (AEA-0312)

SHARAD INSTITUTE OF TECHNOLOGY COLLEGE OF ENGINEERING

Address: - Near Omkareshwar Temple, Yadrav, Ichalkaranji.

Dist.-Kolhapur, Ph. No. 02322-252796, 252896

Web: [www.sitcoe.org.in](http://www.sitcoe.org.in)

January 2022



## I. Table of Content

Sr. No.	Index	Page No.
I	Table of Contents	I
II	Acknowledgement	1
III	Introduction	2
IV	Executive Summary	3
V	Description and Energy Consumption	6
VI	Energy Scenario	9
VII	Energy Conservation Measures	11
VIII	Design of Solar PV Grid Rooftop System	13
IX	General Recommendations	14
X	Conclusion	14
XI	List of Manufacturers	15
XII	Tariff applicable to College building as per MAHAVITRAN	18



## II. Acknowledgement

Energy Audit Team of SITCOE expresses our sincere gratitude to management of Krantiagrani G. D. Bapu Lad Mahavidyalaya, Kundal, for providing us an opportunity to conduct an Energy Audit of their organization located in Kundal Dist. Sangli 416309. We are grateful to **Hon. MLC Arun (Anna) Lad**, President, Gandhi Education Society, Kundal, **Hon. Kiran (Tatya) Lad**, Secretary Co-ordination Committee, **Hon. Prakash (Bhau) Lad**, Secretary, Gandhi Education Society, Kundal, **Hon. Govind (Nana) Dubal**, Treasurer, **Hon. Dr. Pratap Lad** Incharge Principal, **Hon. Dr. B. D. Waghmare**, Co-ordinator, IQAC, **Hon. Dr. M. G. Sadamate**, Head, Department of Economics and **Shri. R. G Jangam**, **Shri. Kiran Aute** and other administrative staff for showing keen interest in the study and active help and co-operation extended to SITCOE Energy Audit Team during study.

We do hope that you will find the recommendations given in this report useful in helping you save energy. While we have made every attempt to adhere to high quality standards, in both data collection and analysis, as well as in presentation through the report, we should welcome any suggestions from your side as to how we can improve further.

In case of any suggestions or queries:

**Sharad Institute of Technology COE, Yadrav**

Dr. Sanjay Khot (BEE Accredited Energy Auditor **AEA-0312**)

Email: [principal@sitcoe.org.in](mailto:principal@sitcoe.org.in)

Mobile- +91 7350542020

Yadrav (Ichalkaranji), Tal. Shirol,

Dist. Kolhapur -416121, Maharashtra.





### III. Introduction

Project	Energy Audit
Client	Krantiagrani G. D. Bapu Lad Mahavidyalaya, Kundal
Segment	Properties owned by College
Contact	<b>Hon. Dr. Pratap Lad</b> Incharge Principal <b>Hon. Dr. M. G. Sadamate</b> Head, Department of Economics
Site	Krantiagrani G. D. Bapu Lad Mahavidyalaya, Kundal, Dist. Sangli 416309, Maharashtra, India
Consultant	<b>Dr. Sanjay Khot (AEA-0312)</b> BEE Accredited Energy Auditor
Involved faculty	1) Dr. M. M. Khade 2) Mr. S. S. Gurav
Duration	January 2022
Project scope	Conducting energy audit as per Bureau of Energy Efficiency (BEE) New Delhi to establish energy consumption in the buildings of municipality and estimate scope for energy saving and also to recommend energy efficient appliances in place of energy intensive with payback calculation.
Report	This document gives recommendations, details of survey and the way forward.
Notes	The suggestions/ alternatives in the audit report are based on the inventory, name plate details and usage of equipment systems. It is recommended to obtain vendor quotations before implementation.





## IV. Executive Summary

### ❖ Highlights

Description	Units	Values
Total annual savings	₹.	32782
Total investments	₹.	102725
Payback period	Years	3.13
Annual electricity consumption	kWh	9173
Annual electricity cost/	₹.	104993

### ❖ Impact of Proposed Energy Conservation Measures

Description	Units	Values
Electricity Saving	kWh/annum	2858
	%	31.16
Estimated annual cost reduction	₹/annum	32782
Simple Payback period	Years	3.13





❖ **Summary of Energy Conservation Measures**❖ **Table 1: Summary of Energy Conservation Measures**

Sr. No.	Energy Conservation Measures	Annual Saving		Investment	Simple payback period	Reduction in CO <sub>2</sub> emissions
		kWh	₹	₹	Years	MT/year
1	Replace conventional ceiling fan with energy efficient fan (35 Nos.)	2331	26737	98000	3.67	1.91
2	Replace conventional tube with energy efficient tube (21 Nos.)	527	6045	4725	0.78	0.43
<b>Total</b>		<b>2858.04</b>	<b>32781.72</b>	<b>102725</b>	<b>3.13</b>	<b>2.34</b>

**Table 2: Recommendation for nearly zero energy building**

Name of Building	Annual Electricity Consumption kWh	Daily Electricity Consumption kWh	Unit Charge	Solar PV System Required -kW <sub>p</sub>	Annual Electricity Generated by Solar kWh	Monetary Saving	Investment @30000/kW <sub>p</sub>	Simple Payback
College Building	9173	25.13	11.47	3	2925	33549.75	90000	2.68

\* Already 5 kW Solar PV system is exist, additional 3 kW solar PV system need to be installed





### ❖ Impact of Solar PV System

❖ Table 3: Impact of electricity generated by Solar PV System

Description	Unit	Values
Capacity of solar PV System	kWp	5
Date of System Installed	-	22-Nov-21
Type of Installation	-	On grid
Electricity Generated by Solar System		
On-Grid (from 22/11/21 to 17/02/22)	kWh	1676
Total Electric Consumption/Annum	kWh	9173
Daily Electric Consumption	kWh	31
Daily Electricity generated by Solar	kWh	19
Impact of Solar PV system	-	61 % of required electricity has been generated by solar PV system





## V. Description and Energy Consumption

### About Krantiagrani G. D. Bapu Lad Mahavidyalaya, Kundal

Krantiagrani G. D. Bapu Lad Mahavidyalaya Kundal, was established in the year 1998. The motto of the college is **“Swawlamban, Swabhiman, Swadeshprem hech Amache Brid”**.

This motto is being fulfilled by imparting the higher education to the students of Kundal and nearby villages and preparing them to face the challenges of the fast changing world. Since establishment of the college from 1998, eleven batches have been graduated from our college. The enrollment of the girl students is also increasing significantly. After completing degree course our students pursue higher studies in various subjects. The Alumni are now serving in various reputed private/ public sector organizations. We have succeeded in creating educational awareness among the people of Kundal and nearby villages especially about the importance of higher education of girl

As our students come from poor economic background, various scholarships and free -ships are made available for them. The college also helps the outstanding students by giving concession in fees and other facilities.

**Table 4: -Details of property**

Sr. No.	Name of Building	Consumer No.	Tariff Category	Annual Electricity Consumpti on kWh	Annual Electricity Bill ₹
1	Krantiagrani G. D. Bapu Lad Mahavidyalaya, Kundal	281700155446	052 /LT-II COMM < 20KW	9173	104993.17





### Inventory of Krantiagrani G. D. Babu Lad Mahavidyalaya, Kundal

The details of inventories are shown in the table.

**Table 5: Inventory of Krantiagrani G. D. Babu Lad Mahavidyalaya, Kundal**

Name of Department	Old Tube (40 W)	Old Tube (28W)	Ceiling fan	Wall Fan	LED Bulb (20 W)	LED Bulb (9 W)	LED Bulb (0.5 W)	Incandescen nt bulb	Computer	Printer	Xerox	LED Tube	Focus bulb (40 W)	Water cooler
Office		2	4						3	1	1	2		
Toilet							2							
Principal Cabin			4			1						3		
Department Office		1	2						2			1		
Staff Room			4						2					
Exam Department		1	1						1			1		
Class Rom 1	2		2											
Class Rom 2	2		2											
BCA II		1	1											
BCA I		1	1											
Computer Lab (BCA)	5	1	4						46	1		2		
NAAC Room	2		1	1					2	1		1		
Corridor	2	1					1					4	1	2
Strong Room			1						1			2		





Name of Department	Old Tube (40 W)	Old Tube (28W)	Ceiling fan	Wall Fan	LED Bulb (20 W)	LED Bulb (9 W)	LED Bulb (0.5 W)	Incandescent bulb	Computer	Printer	Xerox	LED Tube	Focus bulb (40 W)	Water cooler
<b>First Floor</b> Class room with department			3						1			3		
Class room			3						2			3		
Class room			3						2	1		3		
Toilet												2		
Gents												2		
Ladies												2		
<b>Basement</b> Toilet								1						
Gymkhana	2		1											
Corridor	2											1		
BSc I Classroom			1									1		
BSc II			1									1		
BSc III	1		1											
Bcom Department	1		1						1	1				
Library	4	2	4						3	1		2		
<b>Lab</b> Zoology			2						1			2		
Botany									1			2		
Physics			1						1			2		
Classroom	1		1											
Classroom			2		2									
Store		2							1					
Chemistry	2	4	4											
Cultural Hall			12									12		
<b>Total</b>	<b>26</b>	<b>16</b>	<b>67</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>70</b>	<b>6</b>	<b>1</b>	<b>52</b>	<b>1</b>	<b>2</b>





## VI. Energy Scenario

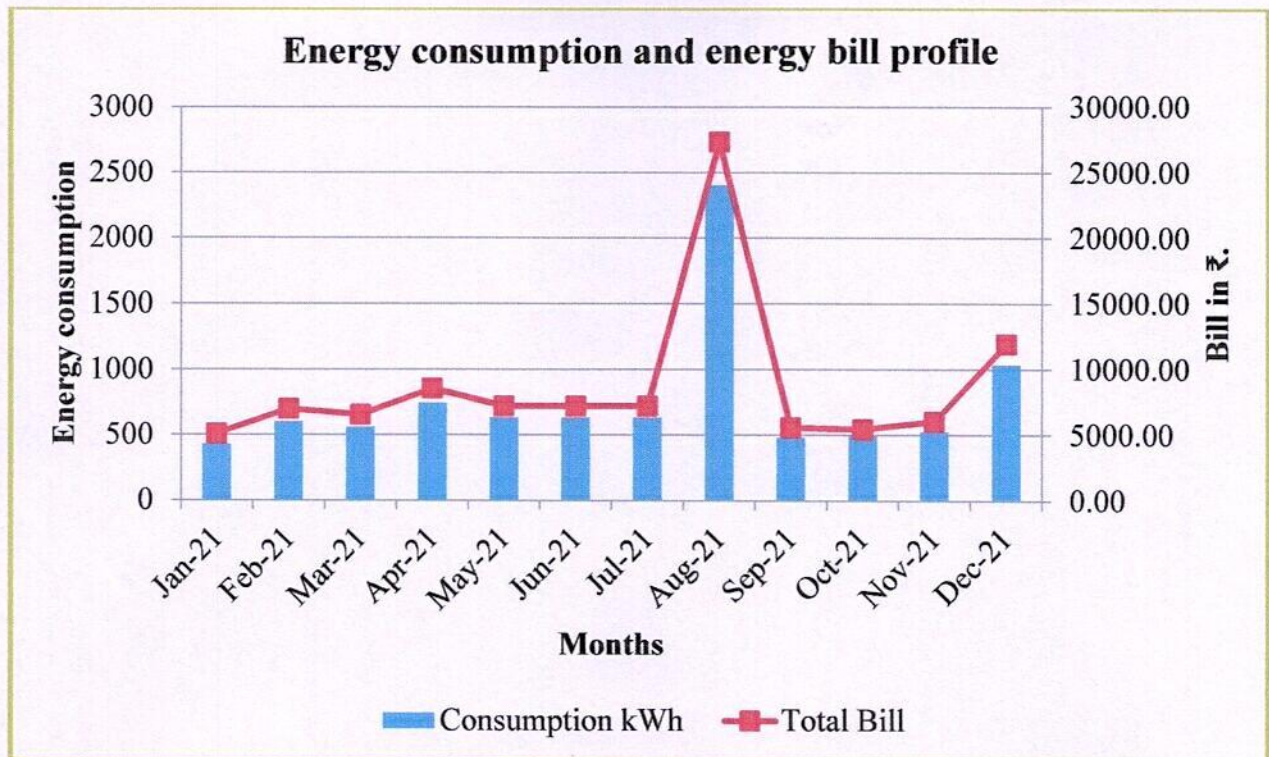
**Table 6: Electrical Bill Analysis of Krantiagrani G. D. Bapu Lad Mahavidyalaya, Kundal**

Month	Consumption kWh	Fixed Charges	Energy Charges	Wheeling Charges	Electricity Cost	Sale Tax	Total Bill	Actual unit charge
Jan-21	428	403	3150.08	620.6	876.47	34.24	5084.39	11.88
Feb-21	600	403	4416	870	1194.69	108	6991.69	11.65
Mar-21	558	403	4106.88	809.1	1116.99	100.44	6536.41	11.71
Apr-21	743	403	5464.52	1075.81	1458.17	133.74	8535.24	11.49
May-21	634	415	4552.12	874.92	1226.83	114.12	7182.99	11.33
Jun-21	634	415	4552.12	874.92	1226.83	114.42	7183.29	11.33
Jul-21	634	415	4552.12	874.92	1226.83	114.12	7182.99	11.33
Aug-21	2404	1660	17260.72	3317.52	4670.03	432.72	27340.99	11.37
Sep-21	479	415	3439.22	661.02	948.2	86.22	5549.66	11.59
Oct-21	496	415	3261.28	684.48	978.76	89.28	5428.80	10.95
Nov-21	525	415	3769.5	724.5	1030.89	94.5	6034.39	11.49
Dec-21	1038	830	7452.84	1432.44	2040.21	186.84	11942.33	11.51
Average	739.55	523.82	5320.41	1035.25	1450.43	129.25	8749.43	11.47
Max	2404	1660	17260.72	3317.52	4670.03	432.72	27340.99	11.88
Min	428	403	3150.08	620.6	876.47	34.24	5084.39	10.95
Total	9173	6592	65977.4	12820.23	17994.9	1608.64	104993.17	

### Observation:

- Maximum consumption 2404 kWh in month of August and minimum 428 kWh in month of January.
- The average energy consumption is 739.55 kWh.

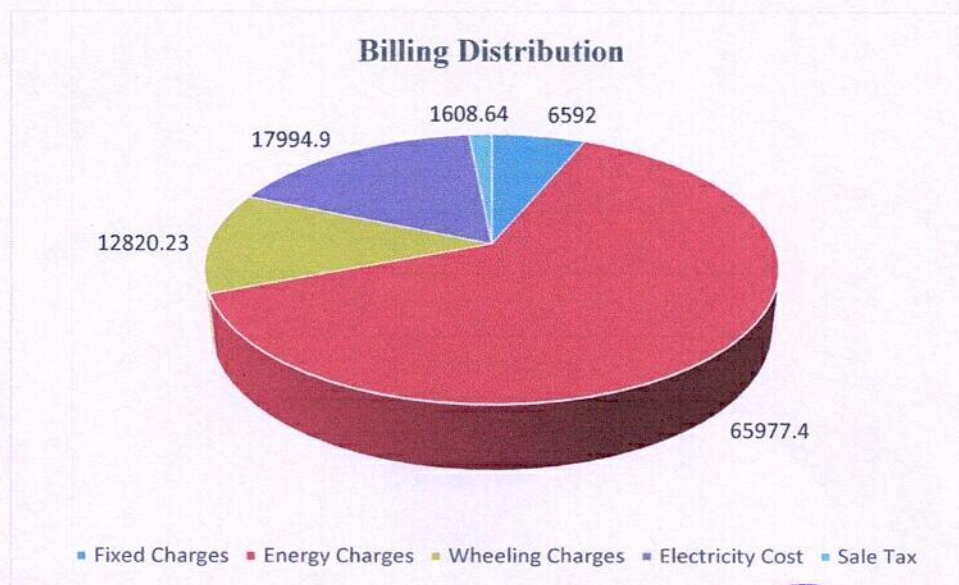




**Figure 01: Contract Demand, Recorded Demand and PF Profile of Krantiagrani G. D. Bapu Lad Mahavidyalaya, Kundal**

**Observation:**

- Energy consumption varies from 428 to 2404 kWh from January 2021 to December 2021.
- The bill as per MERC for last twelve months is ₹ 104993.



**Figure 02: Billing Distribution of Krantiagrani G. D. Bapu Lad Mahavidyalaya, Kundal**



## VII. Energy Conservation Measures

### 1. Replacing the Conventional fan with energy efficient fan

#### Findings:

The conventional fan consumes average 65 W energy.

#### Recommendations:

Replace the conventional fan with energy efficient fan which consume less energy.

#### Benefits:

The cost benefit analysis of replacing energy efficient fan is given below.

**Table 7: Cost benefit analysis of replacing the energy efficient fan**

Description	Units	Value
<b>Present system</b>		
Type of fan	-	Ceiling fan
Number of existing fan	Nos	67
Wattage /fan	Watt	65
Usage of fan per day	Hrs	6
Working days per annum	Days	300
Annual Energy consumption	kWh	7839
<b>Proposed system</b>		
Recommended for replacement	%	52%
Recommended of EE fan	Nos	35
Wattage of EE fan	Watt	28
Annual Energy consumption	kWh	1764
Annual Power saving	kWh	2331
Energy tariff	₹	11.47
Monitory saving	₹.	26736.57
Investment/fan	₹	2800
Total investment	₹.	98000
Simple Payback period	Years	3.67
Reduction in CO <sub>2</sub> emissions	MT/Years	1.91



## 2. Replacing the Tube with LED tube

### Findings:

Current existing tube light consumes 40 W and 28 W which is replaced by LED tube.

### Recommendations:

Replace the current tube light with LED tube which consume less energy.

### Benefits:

The cost benefit analysis of replacing current tube light with LED tube is given below.

**Table 8: Cost benefit analysis of replacing the current tube light with LED tube**

Description	Units	Value	Value
<b>Present system</b>			
Number of existing tube lights(T12/T8)	Nos	26	16
wattage /tube	Watt	40	28
Total wattage	Watt	1040	448
Daily usage	Hrs/day	6	6
Annual working days	days/yr	240	240
Annual Energy consumption	kWh	1498	645
<b>Proposed system</b>			
Recommended for replacement	%	50%	50%
Recommended of LED tube light	Nos	13	8
Wattage of LED tube light	Watt	18	18
Annual Energy consumption	kWh	337	207
Annual Power saving	kWh	412	115
Energy tariff	₹	11.47	11.47
Monitory saving	₹.	4723.80	1321.34
Investment/LED tube light	₹	225	225
Total investment	₹.	2925.00	1800.00
Simple Payback period	Years	0.62	1.36
Reduction in CO2 emissions	MT/Years	0.34	0.09



## VIII Design Solar PV Grid Rooftop System

**Table 9: Solar PV Grid Rooftop System**

Name of Building	Annual Electricity Consumption kWh	Daily Electricity Consumption kWh	Unit Charge	Solar PV System Required- kW <sub>p</sub>	Annual Electricity Generated by Solar kWh	Monetary Saving	Investment @30000/kw <sub>p</sub>	Simple Payback
College Building	9173	25.13	11.47	9	8775	100649.25	270000	2.68





### IX. General Recommendations: -

- Establish Energy conservation cell.
- Procure only B.E.E star labeled appliances ([www.beestar.com](http://www.beestar.com))
- Don't use discarded old conventional appliances at other places.
- Use occupancy sensor at appropriate place.
- Display energy conservation poster at every building.
- Clean window glass regularly.
- Steps to follow before procurement of renewable energy system-
  1. Conservation of Energy
  2. Replacement of all energy intensive appliances with energy efficient appliances.
  3. Finally install the preferred renewable energy system

### X. Conclusion













Krantiagrani G. D. Bapu Lad Mahavidyalaya, Kundal has scope to install renewable energy system. The energy intensive appliances need to be replaced with energy efficient appliances.

The annual energy consumption of Krantiagrani G. D. Bapu Lad Mahavidyalaya, Kundal is 9173 kWh. The total annual electricity bill is ₹ 104993. The outcome of our proposed system will lead to an annual saving of ₹ 32782. It will also lead to a decrease of 2.34 MT in emission of CO<sub>2</sub> per year.

Solar PV on Grid Rooftop System should be installed on college building need to be repair. **As per BEE, New Delhi these buildings will be considered nearly Zero Energy Buildings (nZEB).** The installation of Solar PV on Grid Rooftop System will further increase the total annual savings by ₹ 100649.












**XI. List of Manufacturers: -****Star Rating List for Room Air Conditioner (Variable Speed)**

S No	Brand	Type	Model No	ISEER (Wh/Wh)	Nominal Marketing capacity (Ton)	Electricity Consumption (kWh/year)	Approval Date	Valid Till	Star Rating
1	LG	Cassette air conditioner	JT-Q18GPLE7	4.08	1.5	1000.43	05-02-2019	31-12-2020	
2	LG	Cassette air conditioner	JT-Q18GPLE8	4.08	1.5	1000.43	05-03-2020	31-12-2020	
3	VOLTAS	Split air conditioner	4502844	4.05	1.5	994.19	20-04-2020	31-12-2020	
4	VOLTAS	Split air conditioner	4502901	4.05	1.5	994.19	19-05-2020	31-12-2020	
5	VOLTAS	Split air conditioner	4502849	4.05	1.5	998.58	01-06-2020	31-12-2020	
6	VOLTAS	Split air conditioner	4502860	4.05	1.5	992.75	01-06-2020	31-12-2020	
7	MITSUBISHI ELECTRIC	Split air conditioner	MSY-JS18VF	4.23	1.5	951.43	28-05-2020	31-12-2020	
8	MITSUBISHI ELECTRIC	Split air conditioner	MSY-RJS18VF	4.23	1.5	951.43	24-07-2020	31-12-2020	
9	BLUE STAR	Split air conditioner	IH418SAFU	4.3	1.5	931.8	10-08-2020	31-12-2020	
10	VOLTAS	Split air conditioner	4502859-184V CZP	4.03	1.5	999.86	17-09-2020	31-12-2020	
11	HAIER	Split air conditioner	HSU18C-NMW4B (INV)	4.1	1.5	997.07	15-09-2020	31-12-2020	
12	LLOYD	Split air conditioner	LS18142MP	4.11	1.5	984.04	13-02-2019	31-12-2020	

















## Star Rating List for Computer

S.No	Brand	Model No	TEC (Calculate d) Rated (W)	Poff Rated (W)	Piddle Rated (W)	Psleep Rated (W)	Approval Date	Valid Till	Star Rating
1	KBS	KBS ELEGANCE (BEE)	83.05	1.26	28.83	1.91	19-06-2018	18-06-2021	
2	SPECTRA	SDT-i8000 (Series i7000/6000/5 000/4000/300 0/2000)	88.39	1.0481	48.513	1.5039	10-12-2018	09-12-2021	
3	COCONICS	CNBIC-AA01	129.75	7.4	17.2	14.2	14-05-2020	13-05-2023	
4	KBS	KBS Attitude (BEE)	80.04	1.27	25.24	2.19	25-07-2018	24-07-2021	
5	KBS	KBS Supreme (BEE)	86.78	1.30	27.79	2.32	25-07-2018	24-07-2021	
6	KBS	KBS Ultima20	85.84	0.316	30.43	1.72	13-09-2018	12-09-2021	
7	ACXXEL	ACL-1077DS	195.89	2.2	45.0	2.49	04-04-2019	03-04-2022	
8	INP	i1000	183.61	24.1	24.4	14.1	27-08-2019	26-08-2022	
9	HPC	SHAURYA	118.79	2.2	33.8	3.0	07-10-2019	06-10-2022	





### Star Rating List for Ceiling Fan

S.No	Brand Name	Model No	Minimum air delivery (Cubic m/min)	Input Power (W)	Service value	Approval Date	Valid Till	Star Rating
1	SUPERFAN	Super Q	227	25	9.0	27-08-2019	30-06-2022	
2	SUPERFAN	Super RX/X1/X7	220	35	6.29	27-08-2019	30-06-2022	
3	MAYA	GABBAR	275	32	8.59	09-08-2019	30-06-2022	
4	MAYA	Ecological	180	22	8.18	27-08-2019	30-06-2022	
5	POLAR	PS-32	230	32	7.18	27-08-2019	30-06-2022	
6	LUKER	ECO 30	230	30	7.66	01-09-2019	30-06-2022	
7	MAYA	Super Eco Tech	230	27	8.51	26-08-2019	30-06-2022	
8	Panasonic	F-12XDA	230	30	7.66	04-09-2019	30-06-2022	
9	CINNI	DYNASTY-27	216	27	8	29-08-2019	30-06-2022	
10	INDCOOL	IDCCF500	210	28	7.5	27-08-2019	30-06-2022	
11	VIDISHA	ACE-GREEN	215	27	7.96	29-08-2019	30-06-2022	
12	ESHA ELECTRIC	SLAT-30	220	30	7.33	27-08-2019	30-06-2022	





## XII. Tariff applicable to College Building as per MAHAVITRAN

### Rate Schedule

Tariff w.e.f. 1 April, 2020 to 31 March, 2021

Consumption Slab (kWh)	Fixed/ Demand Charge	Wheeling Charge (Rs/kWh)	Energy Charge (Rs/kWh)
<b>LT VII (B): LT - Public Services – Others</b>			
(i) < 20 kW	Rs. 362.00/Month	1.45	4.86
(ii) > 20 - ≤ 50 kW	Rs. 362.00/kW/Month	1.45	7.44
(iii) > 50 kW	Rs. 362.00/kW/Month	1.45	7.84
<b>ToD Tariffs (in addition to above base Tariffs) (Rs/kWh)</b>			
2200 Hrs-0600 Hrs			-1.50
0600 Hrs-0900 Hrs & 1200 Hrs-1800 Hrs			0.00
0900 Hrs-1200 Hrs			0.80
1800 Hrs-2200 Hrs			1.10

Tariff w.e.f. 1 April, 2021 to 31 March, 2022

Consumption Slab (kWh)	Fixed/ Demand Charge	Wheeling Charge (Rs/kWh)	Energy Charge (Rs/kWh)
<b>LT VII (B): LT - Public Services – Others</b>			
(i) < 20 kW	Rs. 373.00/Month	1.38	4.68
(ii) > 20 - ≤ 50 kW	Rs. 373.00/kW/Month	1.38	7.28
(iii) > 50 kW	Rs. 373.00/kW/Month	1.38	7.49
<b>ToD Tariffs (in addition to above base Tariffs) (Rs/kWh)</b>			
2200 Hrs-0600 Hrs			-1.50
0600 Hrs-0900 Hrs & 1200 Hrs-1800 Hrs			0.00
0900 Hrs-1200 Hrs			0.80
1800 Hrs-2200 Hrs			1.10

### Rate Schedule

Tariff w.e.f. 1 April, 2020 to 31 March, 2021

Consumer Category	Fixed/Demand Charge (Rs/kW/Month)	Wheeling Charge (Rs/kWh)	Energy Charge (Rs/kWh)
<b>LT VI: LT – Street Light</b>			
(A) Gram Panchayat, A, B & C Class Municipal Councils	111.00	1.45	4.90
(B) Municipal Corporation Areas	111.00	1.45	5.97

Tariff w.e.f. 1 April, 2021 to 31 March, 2022

Consumer Category	Fixed/Demand Charge (Rs/kW/Month)	Wheeling Charge (Rs/kWh)	Energy Charge (Rs/kWh)
<b>LT VI: LT – Street Light</b>			
(A) Gram Panchayat, A, B & C Class Municipal Councils	114.00	1.38	5.00
(B) Municipal Corporation Areas	114.00	1.38	6.09





**LT II: LT – Non-Residential or Commercial****Rate Schedule**

Tariff w.e.f. 1 April, 2020 to 31 March, 2021

Consumption Slab (kWh)	Fixed/ Demand Charges	Wheeling Charges (Rs. /kWh)	Energy Charge (Rs. /kWh)
LT II (A) 0-20 kW	Rs. 403.00 per Month	1.45	7.36
LT II (B) > 20 kW and $\leq$ 50 kW	Rs. 403.00 per kW per Month	1.45	10.72
LT II (C) > 50 kW	Rs. 403.00 per kW per Month	1.45	12.83
TOD Tariffs (in addition to above base Tariffs) (Rs/kWh)			



## **Green Audit Report**

**Krantiagrani G.D.Bapu Lad Mahavidyalaya,  
Kundal,  
Tal-Palus, Dist-Sangli,  
Maharashtra**

**Prepared by  
IQAC  
Krantiagrani G.D.Bapu Lad Mahavidyalaya,  
Kundal**

**2020-21**







## FOREWORD...

World is facing various serious environmental issues, different reports from World Health Organization, IPCC, various National and International organizations highlights the Environmental issues are most sensitive and widely discussed issues in the world today. From local issues like unsafe drinking water, regional issues like urban smog to global warming to deforestation etc. are the environmental issues that are discussed at global level but true fact is that regional or local activities are responsible to make such issues global. On the background of scenario components involved in higher education institutions like universities, colleges, research institutes are expected to take lead role in environmental conservation and protection. Institutions must play an active role in creating and modeling solution for environmental problems.

Krantiarani G.D. Bapu Lad Mahavidyalaya is following different sustainable practices as their vision. College has been following eco-friendly and sustainable practices to manage the available resources.

Green auditing of college campus is planned systematic assessment of day to day activity with special reference conservation of natural resources, optimum use of available resource and control over waste generation. Green audit assessment will show way to find out the eco-friendly and a non-eco-friendly practice on the campus. Objectives of green auditing varies with the operational activities of the organization. Green audit show alternative path for management for non-ecofriendly activities. It also promotes a good environmental management practices and raises the awareness about the environmental conservation and its long term benefits. College has already Implemented conservation practices in vision, which provides chance to explore opportunities for better performance in the future.

As a part of over the past five years college has fixed goal for conservation of environment and sustainable practices. For the achievement of goal college accepted various new and advanced technologies which are eco-friendly; such as self sufficiency in water by roof top rain water harvesting systems.

I am very happy to forward this Green Audit report of Krantiarani G.D. Bapu Lad Mahavidyalaya, Kundal. I must congratulate IQAC and his team for efforts taken for the completion of such type of report. I hope the report will be helpful to all concerned and will motivate all to change non sustainable practices.

Principal

Krantiarani G.D. Bapu Lad Mahavidyalaya, Kundal

**Incharge Principal**  
Krantiarani G.D. Bapu Lao  
Mahavidyalaya, Kundal  
Tal-Palus, Dist- Sonoli





## **Contents**

### **1.0 Introduction**

- 1.1 Infrastructure
- 1.2 Green audit an overview
- 1.3 Need of Green audit
- 1.4 Goals of Green audit
- 1.5 Objectives of Green audit

### **2.0 Methodology**

- 2.1 Survey by Questionnaire
- 2.2 On site visit and observations
- 2.3 Data analysis and final report preparation.

### **3.0 Overview of Green audit**

- 3.1 Green Cover
- 3.2 Waste Management
- 3.3 Electricity and Energy audit
- 3.4 Water Conservation
- 3.5 Health and Hygiene
- 3.6 Training and Awareness.
- 3.7 Corporates Social Responsibility

### **4.0 Summary and Recommendation.**





## INTRODUCTION

Krantiagrani G. D. Bapu Lad Mahavidyalaya Kundal, was established in the year 1998. The motto of the college is **“Swawlamban, Swabhiman, Swadeshprem hech Amache Brid”**. This motto is being fulfilled by imparting the higher education to the students of Kundal and nearby villages and preparing them to face the challenges of the fast changing world. Campus is covering an area of 2 acres, with 9 under graduate departments on campus. Institution provides education in faculties of Arts, Social Science, Science, Computer Application and Commerce.

### 1.1 Infrastructure

The college located at west side of Kundal approximately 0.5 km from bus stand. They have their independent infrastructure. The college is situated on a plot of land measuring 2 acres of land. The Master Plan of the College campus indicates the existing buildings. It has 2 separate buildings. Totally, there are 14 classrooms, 1 computer lab Laboratories, 1 hostels including administrative office. All the buildings have adequate basic amenities including drinking water. The college library is equipped with 11570 numbers of books including novels, magazine reference books, and text books. It has a reading room where magazines and news papers are available. The College inculcates civic responsibilities among the students through N.S.S, Students do participate in all such activities. Strategic planning and technologies are used by the institution for efficient running, particularly in resource mobilization.

The college houses

Library

Classrooms

Administrative Office

Computer Lab

Gymnasium



Parking Facility  
Multi-purpose Hall



### ***1.2 Green audit an overview:***

Educational Institutes are playing a key role in continues development of human resources worldwide through teaching and research. An educational institute conducts various activities with aim to percolate the knowledge among the different levels of society. Likewise educational institutes also try to give issues related environmental conservation and pollution control. Various types of evolutionary methods are used to identify the environment concerning problem. It includes Environmental Impact Assessment (EIA), Social Impact Assessment (SIA), Carbon Footprint Mapping, Green audit etc.

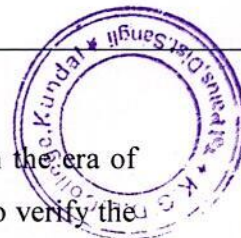
“Green audit is a tool to highlight general practices accepted and implemented by organization in term of its impact on environment”. Green audit also focus on adverse practices which are cause and responsible for harm to environment. Green audit shows strength and weakness of organization towards protection and conservation of environment. It also mark and highlight the non-accepted practices of natural resources utilization. Green audit shows the path to continuously run healthy practices, new innovative system for optimum utilization of resource and minimization of waste generation. It helps for protection and conservation of environment, natural resources and lead institution sustainable campus in social, economical and environmental views.

### ***1.3 Need of Green auditing:***

Green auditing is the process of assessment of practices accepted by institution in view of whether they are ecofriendly and sustainable or not. Traditionally, Indian culture teaches good and efficient users of natural resources. But over the period of time uncontrolled excess use of resources like energy, water, chemicals are become threat to the environment and society also. Now, it is necessary to check whether our accepted practices are consuming more than required resources? Whether we are handling waste carefully? Where we have control over the use of natural resources. Green audit shows all such



practices and gives an well direction to optimizes the use of natural resource. In the era of global warning, climate change, pollution and resource depletion it is necessary to verify the accepted practises and convert it in to green and clean one. Green audit provides an approach for it. It also increases overall awareness among the stack holders of institution towards an environmental conservation and green practices to be accepted.



#### ***1.4 Goals of Green audit:***

College has conducted green audit with following goals.

1. Baseline data collection of environmental parameters and measures over the environmental issue before they become problem.
2. Find out strength and weakness in green practices.
3. Conduct a survey to collect base line ground reality about green practices.
4. Find out the hurdles in green practice, and suggest solution over the hurdels.
5. Check out the facility of different types of waste management.
6. Increase environmental awareness throughout campus with training.

#### ***1.5 Objectives of Green audit:***

1. To collect the base information over the current practices which can impact on environment?
2. To find out significant environmental issues.
3. Setup goal, vision and mission for environmental conservation and sustainable practices in campus.





## METHODOLOGY

First target was to collect the base line data concern about the green practises. The present report is based on onsite visits, personal observations and questionnaires survey tools. Primarily, based on data requirement, different type of questionnaires were prepared. Questionnaires were provided to all concern asked them to fill the same. The generated data is subsequently gathered and used for further analysis. From the outcome of the overall study, a final report is prepared. Before the survey all the required secondary data were collected from concern departments.

### ***2.1 Survey by Questionnaire:***

Baseline data for green audit report preparation was collected by questionnaire survey method. Questionnaires were prepared based on the guidelines, rules, acts and formats prepared by Ministry of Environment and Forest, New Delhi, Central Pollution Control Board and other statutory organizations. Green audit report of Shivaji University, Kolhapur is used as format for the report preparation. Most of the guidelines and formats based on broad aspects and some of the issues or formats were not applicable for educational institutions. In fact questionnaires were prepared, using these guidelines and formats, combinations, modifications and restructuring them, sets of questionnaires were prepared as solid waste, energy, water, hazardous waste, and e-waste.

All the questionnaires comprises of group of modules. Questionnaires were prepared in such a view that it will be easy to extract the general information of the concerned department, which broadly includes name of the department, total number of students and employees, visitors of the department, averageworkingdays and officetimings etc. Another part of the questionnaires extract the present consumption of resources like water, energy, or the handling of solid and hazardous waste. Maintaining records of the handling of solid and hazardous waste is much important in green audit. Last part of the questionnaires shows possibilities of loss of resources like water, energy due to improper maintains.





### ***2.2 Onsite visit and observations:***

College campus has built up area comprising of various departments, administrative building, Library, Class rooms, staff quarters, student hostels, sports complex. All these amenities have different kind of infrastructure as per their requirement. All these buildings were visited by the surveyors. Presents conditions were checked by specific check list. Personal observations were made during the onsite visit.

### ***2.3 Data analysis and final report preparation:***

Required primary and secondary data were collected by different ways live questioners, check list etc. Collected data were crossed checked during the personal onsite visit. In case of green audit, the filled questionnaires of the survey from each group, were tabulated in excels spreadsheets. The tabulated data is then used for further analysis. SPSS software is used to find out the frequency distribution and results in percentile format. For better understanding of the results and to avoid complications, averages and percentages of the Tables were calculated. Interpretation of the overall outcomes are included in Final report.





## OVERVIEW OF GREEN AUDIT

### Audit Criteria

- 3.1 Green Cover
- 3.2 Waste Management
- 3.3 Electricity and Energy Audit
- 3.4 Water Conservation
- 3.5 Health and Hygiene
- 3.6 Training and Awareness

#### 3.1 Green Cover

The college continuously conducts tree plantation drives as a mission through their, NSS. The plantation movement is conducted during monsoon. College has developed a botanical plant garden. The college premises indicate the awareness level on floral biodiversity among the staff and students of the college.

Counting of trees and shrubs in the college premises was done by Student volunteers. A project on identification of plants in campus was undertaken with the help of Department of Botany. Volunteers from zoology department have maintained PANPOI for the birds in the campus; however, these efforts may be further improved by display of information. College students are also encouraged for bird watching within the campus.

Apart from this, nature club organizes time to time trips and nature treks to places of ecological importance for students who are interested. Following activities clear the intention towards development of Green Belt

#### Drip and sprinkler irrigation system

As a part of water conservation technique College installed drip and sprinkler system for watering the plant.

#### Plantation with villagers at different villages

College has started a unique movement of plantation, motivational approached are developed in local people to plant more and more tree. As a part of this movement villagers from



surrounding villages are motivated to plant a tree in front of their house and nourish the same.



### **3.2 Waste Management**

Solid waste management is a burning issue in current days. The rate of generation of solid waste is very high management technology are too adequate. Unscientific handling of solid waste is also a burning issue which can create threats to public health and environment. It is necessary to manage the solid waste properly to reduce the load on waste management system. The purpose of this audit is to find out current management practice of solid waste generation in the campus. Paper waste is a major solid waste generated in the campus. Most of the departments including office, library are major contributing in the paper waste generation. Followed by paper. Plastic is secondary contributing solid waste generated in large quantity in the campus. Office staff are using one side papers for printing and writing. Biodegradable waste generated in campus is mostly from canteen, and hostels kitchens. Glass waste is less contributing but it takes part in solid waste generation. Glass waste generated from laboratory mainly in the form of bottles, many times bottles are reuse for storing of other chemicals. Other glass waste is thrown with solid waste. The college have well established protocol to recycling and reuse of resources such as paper in the form of annual sale of stored newspapers and waste papers to scrap dealer. Very few departments are categorizing the plastic and sending it for recycling. Wastes such as electronic peripherals and paper wastes are stored and later collected by the peon.

#### **Vermicomposting**

As a part of solid waste management college installed vermicomposting plant. Vermicomposting plant is very useful for kitchen waste management. Kitchen waste is generally generated from hostel and canteen.

### **3.3 Electricity and Energy Audit**

Major energy sources utilized include Solar Energy, electricity and LPG. Major use of the energy is at office, hostel, laboratories, library, canteen and class rooms for lighting,





cooking and laboratory work. Electricity is supplied to the campus by Maharashtra State Electricity Board. There is no provision of generating electricity on site.

The IQAC conducted an Energy Audit as a part of green audit. Prime aim of audit was to find a way of energy conservation. College use solar energy as conventional energy source. It is documented that Placards and posters are displayed near electricity supply and rooms however it was nowhere to be seen during the walk through. The peon switched off all power supply in non-lecture hours and was confirmed during the site walk through visit. Lab In charge of all laboratories conveyed that electricity during nonworking hours are put to off. Different awareness programmes were conducted for peons, staff and Students. The College initiated to install CFL and LED bulbs in the college campus the initiative could be strengthened with help of a action plan. The college targets to reduce electricity out of total electricity consumed in college as per the documents. This may be supported by maintaining proper relevant records and benchmarking the present consumption.

### **3.4 Water Conservation**

For the purpose of water audit an on-site walk through survey and assessment was conducted to determine the efficiency of water use and to develop recommendations for improving water use efficiency. Overall agenda of conducting a water audit is to identify opportunities to make water use more efficient. Water audit includes tracking, assessing and validating all components of flow from distribution system into the consumer's properties. On the other hand, water audit of a campus review direction and quantity of water used for domestic, laboratory, drinking, gardening, sanitary and landscaping processes.

Water meters are used to record the water consumption in the campus. Drinking water are provided on assessable place in the campus. Drinking water is currently not being tested for the water parameters according to prescribed BIS standards for drinking water. Toilets were checked for leakages and spillage. These toilets were checked at random and found to be maintained in leakages and spillage free. College incited to reduce water consumption by raising awareness in students & staff members and having periodic check on leaks. There were no displays of signage or message for Good Practices in the College premises for Water Conservation. It is needed for the continuous highlight of the issue. The college incited to recycle and reuse the wash water of wash basin for gardening purposes as a future plan. The college also planning for the rain water harvesting system as conservation



practices.



### **3.5 Health and Hygiene**

The college incited to promotes Swachh Bharat Abhiyaan by maintaining cleanliness on campus. It is well concentrated on housekeep. Toilets were checked for hygiene, leakages and spillage. These toilets were checked at random and found to be maintained in hygienic condition also students were found to be satisfied with hygiene level. It is documented that Sweeper cleans the floor and toilets regularly Swachh Bharat Abhiyaan are promoted by the NSS wing. For a good hygiene practices college run following activities.

#### **Sanitary napkin wending machine/ disposal machine**

College have ladies hostel with accommodation capacity 26. For the purpose of good hygiene practice sanitary napkin and disposal machine are installed.

#### **Illumination and ventilation**

A college building is more specious and class room and all other rooms are good ventilated. Natural illumination and ventilation is too good. There is no need of artificial ventilation and illumination.

#### **Sanitation drive**

College conducts sanitation drive, which motivated student and staff about the cleanliness practices and give them exposer for the voluntary work.

### **3.6 Training and Awareness.**

The college runs nature club which conducts street plays on various environmental issues. NSS actively participate to promote Swachh Bharat Abhiyaan, and awareness rally. Time to Time College organizes the lectures on experts on the issue of environment and social responsibilities.





## Summary and Audit findings

1. College takes efforts for solid waste management by proper methods.
2. Recycling and reuse practice is followed strongly.
3. Organic and biodegradable waste is composted via Vermicomposting.
4. Electricity consumption is more in computer lab,
5. The college is installing LED bulbs to reduce electricity consumption.
6. Good water conservation program is implemented on campus.
7. There should be well adequate water filtration and Water treatment plants system.
8. E-waste segregation, handling and disposal should be done properly.
9. Visual signage boards for generating awareness about conservation of water and electricity are displayed.
10. Drinking water is currently not being tested for the water parameters according to prescribed standards

## Recommendations

Following are some of the key recommendation for improving campus environment.

1. The college should develop internal procedures to ensure its compliances with environmental issues.
2. Leakages and corrosion of pipes, overhead tanks be maintained timely and promptly.
3. The college should improve its monitoring and reporting system for of water usage, electricity consumption etc.
4. The college should develop a segregation protocol for the segregation of different type of solid waste.
5. To achieve the target of reduction in electricity and water consumption, there should be proper documented management programs to achieve the same.



  
**Incharge Principal**  
Krantiagrani G.D. Bapu Lad  
Mahavidyalaya, Kundal  
Tal-Palus, Dist- Sangli