



**PowerTech Energy Solutions**  
Conserve to Consume

## **Energy & Green Audit Report Of Arts, Commerce and Science College, Alkuti, For the Year of 2022-23**



**Prepared By  
PowerTech Energy Solutions  
(A MEDA Empaneled Class A Category  
Consultancy Firm)**

Submitted By,

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## **Acknowledgement**

PowerTech Energy Solutions extends gratitude to Arts, Commerce and Science College in Alkuti, Parner for extending us the opportunity to conduct the Energy & Green Audit.

We are thankful to the professors & supporting staff of the college for their transparency & consistent support in sharing relevant information and for providing data about policies and projects along with their other valuable information. This report would have not been possible without their support.

The study team would like to acknowledge the following distinguished personnel's of college

- **Dr. Sharad Parkhe – Principal**
- **Prof. Sanjay Jadhav – IQAC Chairman**

## Our Certificates

### BEE Certified Energy Auditor Certificate

Regn. No. EA-20121



Certificate No. 8299

## National Productivity Council (National Certifying Agency)

### PROVISIONAL CERTIFICATE

This is to certify that Mr. / Mrs. / Ms. *Swapnil Sanjay Gaikwad*  
son / daughter of Mr. *Sanjay J. Gaikwad*

has passed the National Certification Examination for Energy Auditors held in August - 2014, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India.

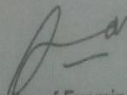
He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.

He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for the Accredited Energy Auditor and issue of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the issuance of an official certificate by the Bureau of Energy Efficiency.

Place : Chennai, India

Date : 9<sup>th</sup> January, 2015

  
Controller of Examination

**Lead Auditor Certificate – ISO 50001: Energy Management System**



**PR366: ISO 50001:2018 Lead Auditor  
(Energy Management System)  
Training Course**

**Certificate of Achievement**

**Atul Kakad**

has successfully completed the above mentioned course and examination.

26th - 30th November 2019

PUNE, INDIA

Certificate No. 35258395 07

Delegate No. 222777

A handwritten signature in black ink, appearing to be "Atul Kakad".

for TÜV NORD CERT GmbH

Essen, 2020-01-08

The course is certified by CQI and IRCA (Certification No. 2088). The learner meets the training requirements for those seeking certification under the IRCA EnMS Auditor certification scheme.

TÜV NORD CERT GmbH

Langemarckstraße 20

45141 Essen

[www.tuev-nord-cert.com](http://www.tuev-nord-cert.com)



## MEDA Registration Certificate

MAHARASHTRA ENERGY DEVELOPMENT AGENCY



### Maharashtra Energy Development Agency

(A Government of Maharashtra undertaking)

Aundh Road, Opposite Spicer College,

Near Commissionerate of Animal Husbandry, Aundh, Pune – 411 067

Ph No: 020-26614393/266144403

Email: [eee@mahaurja.com](mailto:eee@mahaurja.com), Web: [www.mahaurja.com](http://www.mahaurja.com)

ECN/2022-23/CR-44/3803

4<sup>th</sup> October, 2022

### CERTIFICATE OF REGISTRATION FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with **MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)** under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

**Name and Address of the firm** : M/s PowerTech Energy Solutions  
Office No. 10, B-wing, 3rd floor,  
Phuge Prima, Bhosari Dighi Road Bhosari,  
Pimpri Chinchwad- 411, 039.

**Registration Category** : *Empanelled Consultant for Energy Conservation Programme for Class 'A'*

**Registration Number** : *MEDA/ECN/2022-23/Class - A/EA-31*

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **3<sup>rd</sup> October, 2024** from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

General Manager (EC)

## **1 About College**

Arts, Commerce and Science College in Alkuti, Parner began operating in 2004 with 7 teachers and 160 students in the F.Y. BA/BCom department. With time, we have amplified into an institute of 8 departments and 34 teachers handling the educational responsibility of 28 staff and 821 students in 2022-23.

Wide ranging academic facilities endow the institute with great infrastructure for classroom instruction, library study, laboratory practical's, and indoor plus outdoor sports. The college has produced winners at university level wrestling and powerlifting competitions in recent years.

In keeping with the overall obligation to social responsibility, college students participate in Paani Foundation Camp, cleaning of Historical Places, Save Girl Child, and Clean India: Green India. Moreover, our students are actively involved in Nadi Parikrama Shibir, Sangamner and Parner Festival organized by Janseva Foundation, Pravaranagar.Mission

### **1.1 Mission**

To impart moral values and the spirit of fair competition for developing academically sound and socially responsible students.

### **1.2 Vision**

To enable prosperity and holistic personality development by making available avenues of higher education to rural and financially weak students.



## 2 Energy Audit

An energy audit is an inspection, survey and analysis of energy flows, for energy conservation in a building, process or system to reduce the amount of energy input into the system without negatively affecting the output(s). In commercial and industrial real estate, an energy audit is the first step in identifying opportunities to reduce energy expense and carbon footprints.

### 2.1 Electricity Bill Analysis

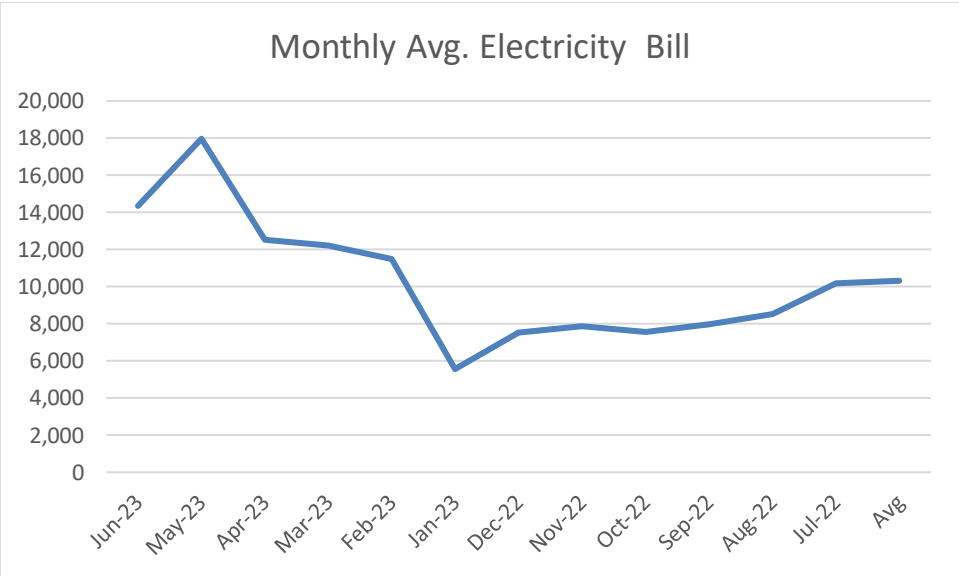
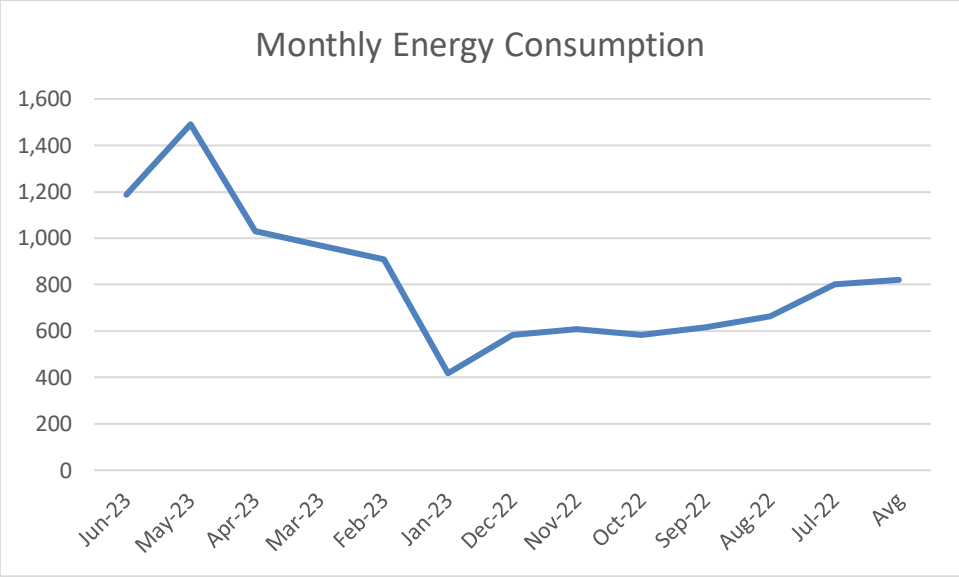
At present, one electricity meter is there for all campus

Bill analysis for consumer number 150920008455 shown below

<b>Consumer : PRINCIPAL ART COMMERCE SCIENCE COLLAGE ALKUTI</b>			
<b>Consumer No. : 150920008455</b>			
<b>Utility : MSEDCL</b>			
<b>Contract Demand (KVA) : 6</b>			
<b>40% Of Contract Demand (KVA) : 2.40</b>			
<b>Month</b>	<b>Billed KWh</b>	<b>Bill (Rs)</b>	<b>Rate (Rs./kWh)</b>
<b>Jun-23</b>	1,188	14,352	12.1
<b>May-23</b>	1,491	17,968	12.1
<b>Apr-23</b>	1,030	12,519	12.2
<b>Mar-23</b>	970	12,217	12.6
<b>Feb-23</b>	910	11,493	12.6
<b>Jan-23</b>	418	5,559	13.3
<b>Dec-22</b>	582	7,537	12.9
<b>Nov-22</b>	609	7,863	12.9
<b>Oct-22</b>	583	7,549	12.9
<b>Sep-22</b>	617	7,959	12.9
<b>Aug-22</b>	664	8,526	12.8
<b>Jul-22</b>	800	10,166	12.7
<b>Avg</b>	822	10,309	12.7

Below graph shows the Monthly billed unit consumption





## 2.2 Observations

- Monthly average billed energy consumption is 822 units.
- Monthly average electricity bill is 10,309 Rs.
- Avg. unit rate is 12.7 Rs./kWh.

## 2.3 Connected Load List – Lighting

Area	Type of Light (LED/Conventional)	Watt	Total Qty.	Daily Running Hrs.	Monthly Working Days	Load in kW	Monthly kWh
Principal Cabin	LED	18	3	8	24	0.054	10.4
History	LED	18	3	8	24	0.054	10.4
Office	LED	18	5	8	24	0.090	17.3
Exam	LED	18	1	8	24	0.018	3.5
F.Y.B.A.	LED	18	4	8	24	0.072	13.8
F.Y.Bcom	LED	18	6	8	24	0.108	20.7
S.Y.Bcom	LED	18	3	8	24	0.054	10.4
Store	LED	18	2	8	24	0.036	6.9
Boyas Toilet	LED	18	3	8	24	0.054	10.4
Botany	LED	18	5	8	24	0.090	17.3
Physics	LED	18	5	8	24	0.090	17.3
Zoology	LED	18	3	8	24	0.054	10.4
Chemistry	LED	18	6	8	24	0.108	20.7
Physical Chemistry	LED	18	1	8	24	0.018	3.5
T.Y.B.A.	LED	18	5	8	24	0.090	17.3
Library	LED	18	4	8	24	0.072	13.8
N.S.S.	LED	18	3	8	24	0.054	10.4
Staff Room	LED	18	3	8	24	0.054	10.4
English	LED	18	1	8	24	0.018	3.5
Ladies Toilet	LED	18	4	8	24	0.072	13.8
Sport	LED	18	2	8	24	0.036	6.9
T.Y.Bcom	LED	18	4	8	24	0.072	13.8
S.Y.B.A	LED	18	4	8	24	0.072	13.8
T.Y.B.A.	LED	18	4	8	24	0.072	13.8
Seminar Hall	LED	18	11	8	24	0.198	38.0
Geography	LED	18	1	8	24	0.018	3.5
Commerce	LED	18	1	8	24	0.018	3.5
Jeena	LED	18	5	8	24	0.090	17.3

Area	Type of Light (LED/Conventional)	Watt	Total Qty.	Daily Running Hrs.	Monthly Working Days	Load in kW	Monthly kWh
<b>1st Flower Ladies Toilet</b>	LED	18	2	8	24	0.036	6.9
<b>Gents Toilet</b>	LED	18	1	8	24	0.018	3.5
<b>Porch</b>	LED	14	13	8	24	0.182	34.9
<b>Front Porch</b>	LED	14	6	8	24	0.084	16.1
<b>Left Side</b>	LED	18	1	8	24	0.018	3.5
<b>Right Side</b>	LED	18	1	8	24	0.018	3.5
<b>Total</b>			<b>126</b>			<b>2</b>	<b>421</b>

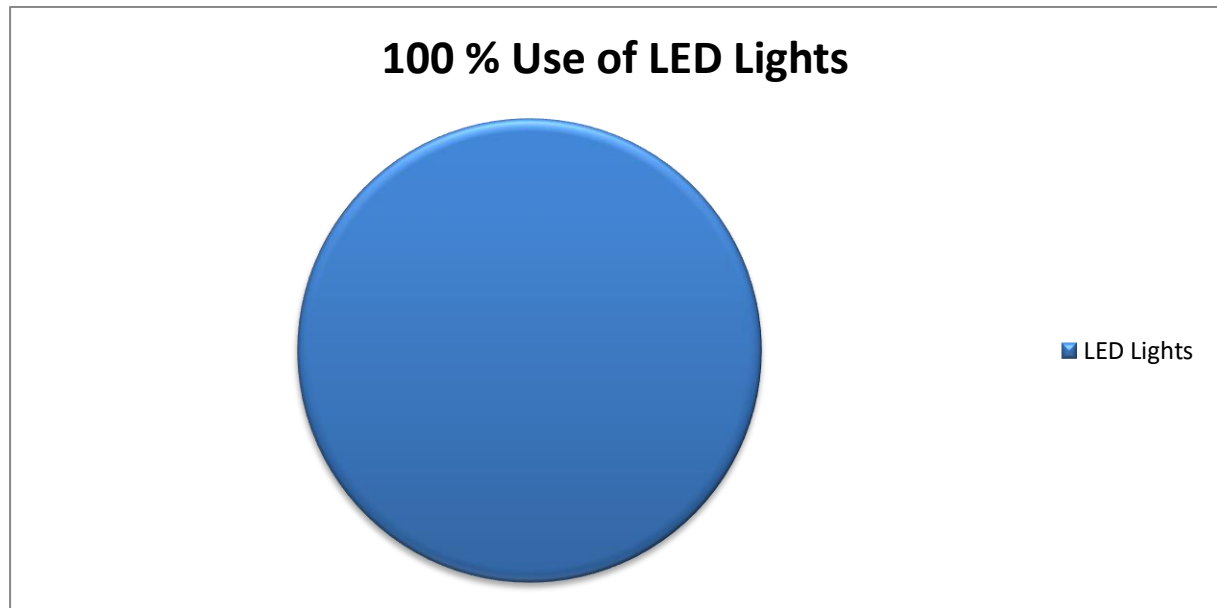
## 2.4 Connected Load List – Fans

Area	Watt	Total Qty.	Daily Running Hrs.	Monthly Working Days	Load in kW	Monthly kWh
Principal Cabin	80	2	2.5	24	0.16	9.6
History	80	1	2.5	24	0.08	4.8
Office	80	3	2.5	24	0.24	14.4
Exam	80	1	2.5	24	0.08	4.8
F.Y.B.A.	80	3	2.5	24	0.24	14.4
F.Y.Bcom	80	3	2.5	24	0.24	14.4
S.Y.Bcom	80	3	2.5	24	0.24	14.4
Botany	80	3	2.5	24	0.24	14.4
Physics	80	2	2.5	24	0.16	9.6
Zoology	80	3	2.5	24	0.24	14.4
Chemistry	80	3	2.5	24	0.24	14.4
Physical Chemistry	80	1	2.5	24	0.08	4.8
T.Y.B.A.	80	2	2.5	24	0.16	9.6
Library	80	4	2.5	24	0.32	19.2
N.S.S.	80	1	2.5	24	0.08	4.8
Staff Room	80	1	2.5	24	0.08	4.8
English	80	1	2.5	24	0.08	4.8
Ladies Toilet	80	1	2.5	24	0.08	4.8
Sport	80	1	2.5	24	0.08	4.8
T.Y.Bcom	80	2	2.5	24	0.16	9.6
S.Y.B.A	80	2	2.5	24	0.16	9.6
T.Y.B.A.	80	2	2.5	24	0.16	9.6
Seminar Hall	80	6	2.5	24	0.48	28.8
Geography	80	1	2.5	24	0.08	4.8
Commerce	80	1	2.5	24	0.08	4.8
<b>Total</b>		<b>53</b>			<b>4</b>	<b>254</b>

## 2.5 Percentage Wise Distribution of Lighting

All the tubes used are of LED type.

Type of Light	Total Nos.	% Use
LED	126	100%
<b>Total</b>	<b>126</b>	



### **3 Requirements of NAAC**

#### **3.1 Alternative Energy Initiative**

##### **3.1.1 Percentage of lighting power requirement met through LED bulbs**

= (Lighting power requirement met through LED bulbs / Total lighting power requirement) X 100

= (126/126) X 100

= **100 %**

##### **3.1.2 Percentage of lighting power requirement met through renewable energy sources**

= (Lighting power required met through renewable sources / Total lighting power requirement) X 100

= (0 / 822) X 100

= **0 %**

## **4 Green Audit**

Green audit was initiated with the beginning of 1970s with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. It exposes the authenticity of the proclamations made by multinational companies, armies and national governments with the concern of health issues as the consequences of environmental pollution. It is the duty of organizations to carry out the Green Audits of their ongoing processes for various reasons such as; to make sure whether they are performing in accordance with relevant rules and regulations, to improve the procedures and ability of materials, to analyze the potential duties and to determine a way which can lower the cost and add to the revenue. Through Green Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out Green Audit. Some of the incidents like Bhopal Gas Tragedy (Bhopal; 1984), Chernobyl Catastrophe (Ukraine; 1986) and Exxon-Valdez Oil Spill (Alaska; 1989) have cautioned the industries that setting corporate strategies for environmental security elements have no meaning until they are implemented.

Green Audit is assigned to the Criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India that declares the institutions as Grade a, Grade B or Grade C according to the scores assigned at the time of accreditation.

The intention of organizing Green Audit is to upgrade the environment condition in and around the institutes, colleges, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environmental friendly institute.

### **4.1 Goals of Green Audit**

- The objective of carrying out Green Audit is securing the environment and cut down the threats posed to human health.
- To make sure that rules and regulations are taken care of
- To avoid the interruptions in environment that are more difficult to handle and their correction requires high cost.
- To suggest the best protocols for adding to sustainable development

### **4.2 Benefits of Green Audit**

- It would help to shield the environment
- Recognize the cost saving methods through waste minimizing and managing
- Point out the prevailing and forthcoming complications
- Authenticate conformity with the implemented laws
- Empower the organizations to frame a better environmental performance
- It portrays a good image of a company which helps building better relationships with the group of stakeholders
- Enhance the alertness for environmental guidelines and duties



## 5 Initiatives by College

### 5.1 Tree Plantation

Tree-planting is the process of transplanting tree seedlings, generally for forestry, land reclamation, or landscaping purpose. It differs from the transplantation of larger trees in arboriculture, and from the lower cost but slower and less reliable distribution of tree seeds.

In silviculture the activity is known as reforestation, or afforestation, depending on whether the area being planted has or has not recently been forested. It involves planting seedlings over an area of land where the forest has been harvested or damaged by fire, disease or human activity. Tree planting is carried out in many different parts of the world, and strategies may differ widely across nations and regions and among individual reforestation companies. Tree planting is grounded in forest science, and if performed properly can result in the successful regeneration of a deforested area. Reforestation is the commercial logging industry's answer to the large-scale destruction of old growth forests, but a planted forest rarely replicates the biodiversity and complexity of a natural forest.

Because trees remove carbon dioxide from the air as they grow, tree planting can be used as agro engineering technique to remove CO<sub>2</sub> from the atmosphere. Desert greening projects are also motivated by improved biodiversity and reclamation of natural water systems, but also improved economy and social welfare due to increased number of jobs in farming and forestry.

College has planted the trees campus area to make it more environments friendly. Below are some records, photos which shows the





## 5.2 Awareness Program on Ozone Day

College has taken initiative to create awareness on effect of greenhouse gases on ozone layer depletion . Below are some photos of same

### PHOTOGALLERY

#### Ozan Day







### 5.3 Restricted entry of automobiles

As the college is located in the rural area, there is low frequency of public transportation. Most of the students do not afford private auto vehicles due to their weak financial condition. Thus, students prefer bicycles to commute from home to college and vice versa. College has set up bicycle stands as a part of discipline and security. Along with this the institute has encouraged the students and staff to observe No Vehicle Day to reduce pollution level and conserve energy. Vehicles are parked near the entrance to reduce noise and air pollution.





GPS Map Camera



Google

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36CF+56C, अहमदनगर, महाराष्ट्र 414305, भारत  
Lat 19.070493°  
Long 74.223303°  
19/08/23 03:06 PM GMT +05:30

## **6 Scope for Improvement**

It is recommended that to explore below project at college level

- Solid waste management – Vermicompost plant
- Liquid waste management – Rain water harvesting
- E- waste management – Collection of E waste and submission of it to Govt. approved E-waste collector