



**PowerTech Energy Solutions**  
Conserve to Consume

# **Energy & Green Audit Report of PDEA's College of Architecture, Akurdi.**



**Submitted By**

**PowerTech Energy Solutions**

Reg. Office: - 6, Vaikuntha Apt, Hire Nagar, Nashik-Pune Road, Nashik.422 011  
Mumbai Office: Shop No.39, Gokul Nagri 1, Thakur Complex, 90 Feet Road, Kandivali (E), Mumbai. 400101  
Pune Office: - 3<sup>rd</sup> Floor, Phuge Prima ,Bhosari Pimpri Chinchwad,411039 Mob. +91 9226936163,  
Email: [info@ptesolutions.in](mailto:info@ptesolutions.in), [www.ptesolutions.co.in](http://www.ptesolutions.co.in)

# ENERGY & GREEN AUDIT COMPLETION CERTIFICATE

This is to certify that the following facility has carried out Energy & Green Audit for the academic year of 2021-22 as per guidelines laid down by the Bureau of Energy Efficiency (BEE), Ministry of Power. Govt. of India

<b>Name of the Installation</b>	PDEA college Of Architecture , Akurdi.
<b>Details of Facilities Audited</b>	Main college building including laboratories, libraries, Classroom, etc.
<b>Date of Energy and Green Audit</b>	22 June 2023
<b>Name of Certified Energy Auditor</b>	Mr. Swapnil Gaikwad
<b>Certification No.</b>	EA 20121
<b>Validity of the Certificate</b>	21 June 2024

Authorised Signatory

Atul S Kakad  
PowerTech Energy Solutions

## 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.

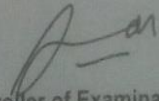
He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.

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 Executive Summary – Energy Audit

ECM	Area	Observations	Proposed Action	Estimated Monthly Energy Saving	Estimated Monthly CO2 Emission Reduction	Estimated Monthly Monetary Savings	Estimated Investment	Payback Period
				<b>kWh</b>	<b>Tones</b>	<b>Rs. Lakh</b>	<b>Rs. Lakh</b>	<b>Months</b>
<b>ECM-1</b>	<b>Lighting</b>	Some of the lighting fixtures in the College building include fluorescent tube lights	The conventional lighting fixtures, such as fluorescent tube lights, should be replaced with energy-efficient LED lighting system.	92	0.9	0.008	0.08	10
<b>ECM-2</b>	<b>Fan</b>	At present, conventional ceiling fans of 70W are installed in Class Room, staff room, labs etc.	New energy efficient fans are available in the market which deliver same air volume at less power consumption  It is recommended to replace existing 70W ceiling fans with new energy efficient 40W BLDC fan	311	2.9	0.028	1.89	68
<b>SUM</b>				<b>403</b>	<b>3.8</b>	<b>0.036</b>	<b>1.97</b>	<b>55</b>
<b>Avg. Monthly Energy Consumption</b>				<b>1957</b>				
<b>% Saving on Energy Usage</b>				<b>20%</b>				
<b>Avg. Monthly Electricity Bill</b>				<b>23066</b>				
<b>% Savings on Energy Bill</b>				<b>15%</b>				

## 2 Executive Summary – Green Audit

Sr.No	Area	Observations	Remark
1	Tree Plantation and Awareness about Energy Conservation	College has carried out tree plantation activity. Several types of trees have been planted by students and staff	Good initiative taken by college toward green campus
2	Vermicompost Plant	Solid waste of tree leaves has been used in vermicompost plants. Same compost has been used in garden area	Good initiative taken by college

## 3 Scope of Improvement

### 3.1 Liquid Waste Management

It seems that the college has not implemented a proper liquid waste management system. Liquid waste management is crucial for maintaining a clean and healthy environment. Implementing an effective liquid waste management system offers several benefits. Firstly, it helps prevent the contamination of water sources such as rivers, lakes, and groundwater, thereby safeguarding the ecosystem and protecting human health. Additionally, proper liquid waste management ensures compliance with environmental regulations and promotes sustainability. By treating and recycling liquid waste, colleges can conserve water resources and reduce their overall environmental footprint. Implementing measures like wastewater treatment and recycling systems can also serve as educational opportunities for students to learn about sustainable water management practices. It is important for the college to recognize the importance of liquid waste management and take appropriate actions to address this issue.

### 3.2 E-Waste Management

At present, there is no policy by the college for the collection and disposal of e-waste generated in campus. It is suggested to do an agreement with the Govt. approved E-waste collector agency to dispose such waste in a prescribed manner

Education society as a whole can have a such agreement

### 3.3 Improvement in Present Rain Water Harvesting System

At present, the college has partially implemented rainwater harvesting system. Pipe line needs to be extended to the borewell so that all rain water accumulated will be discharged in bore to recharge it. At present is being wasted

## Table Contents

<b>1</b>	<b>Executive Summary – Energy Audit</b>	<b>5</b>
<b>2</b>	<b>Executive Summary – Green Audit</b>	<b>6</b>
<b>3</b>	<b>Scope of Improvement</b>	<b>6</b>
3.1	Liquid Waste Management	6
3.2	E-Waste Management	6
3.3	Improvement in Present Rain Water Harvesting System	6
<b>4</b>	<b>Acknowledgement</b>	<b>8</b>
<b>5</b>	<b>About College</b>	<b>9</b>
5.1	Mission	9
5.2	Vision	9
<b>6</b>	<b>Energy Audit</b>	<b>10</b>
6.1	Electricity Bill Analysis	10
6.2	Observations & Remark	13
6.3	Connected Load	14
6.4	Energy Saving Measure 1 – Installation of LED Lights	15
6.5	Observation & Remark	18
6.6	Energy Saving Measure 2 – Energy Efficient Fans	19
6.7	Observation & Remark	21
<b>7</b>	<b>Requirements of NAAC</b>	<b>23</b>
	Alternative Energy Initiative	23
	Percentage of lighting power requirement met through LED bulbs	23
<b>8</b>	<b>Green Audit</b>	<b>24</b>
8.1	Goals of Green Audit	24
8.2	Benefits of Green Audit	25
<b>9</b>	<b>Initiatives by College towards Sustainable Environment</b>	<b>26</b>
9.1	Tree Plantation	26
9.2	Alternate source of energy and energy conservation measures	29
9.3	Vermicompost Plant	32
9.4	Rain Water Harvesting	33



## 4 Acknowledgement

PowerTech Energy Solutions extends gratitude PDEA's college of Architecture , Akurdi 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.

Adv. Sandeep Kadam

Anita Joshi

Nishant Gawande

Swati Rode

Hon. Secretary

Principal

Vice Principal

Co-Ordinator

## 5 About College.

The PDEA's College of Architecture received permission from Council of Architecture, New Delhi (COA Code - MH 96) , State of Maharashtra in 2016 with affiliation form Savitribai Phule Pune University (PU/PN/ ARCH/ 476/2016). PDEA's College of Architecture has 40 Students intake capacity. The College of Architecture received permission for admission of students from Directorate of Technical Education, Mumbai (DTE Code - 6897) in 2017.

There were only 04 architectural colleges running in wide locality of PCMC. Looking toward population, residential-industrial growth rate and the availability of Architectural education in PCMC are main motivation to starts PDEA's Architectural College in the center location of PCMC i.e. at Akurdi. Architecture College provide inside Campus Playground and Canteen facility.

The college has well qualified and experience faculty. College always try to implements curricular, co-curricular and extracurricular programs for all round development of students. The Building has state of art infrastructure with well-equipped laboratory, classroom, studio, Library and computer center. The campus provides Wi-Fi facility, Sports facility to the students. The campus is Ragging Free to ensure the safety of students.

### 5.1 Mission

To empower students to critically engage the complexities of society and nature environment by incorporating fundamental principles of design and to create bright, aspirant and competent architect to serve the society & built our nation.

### 5.2 Vision

To provide holistic architectural environmental where creativity can be engaged, cultivated and nurtured in a framework of values that are socially and environmentally responsible.

## 6 Energy Audit

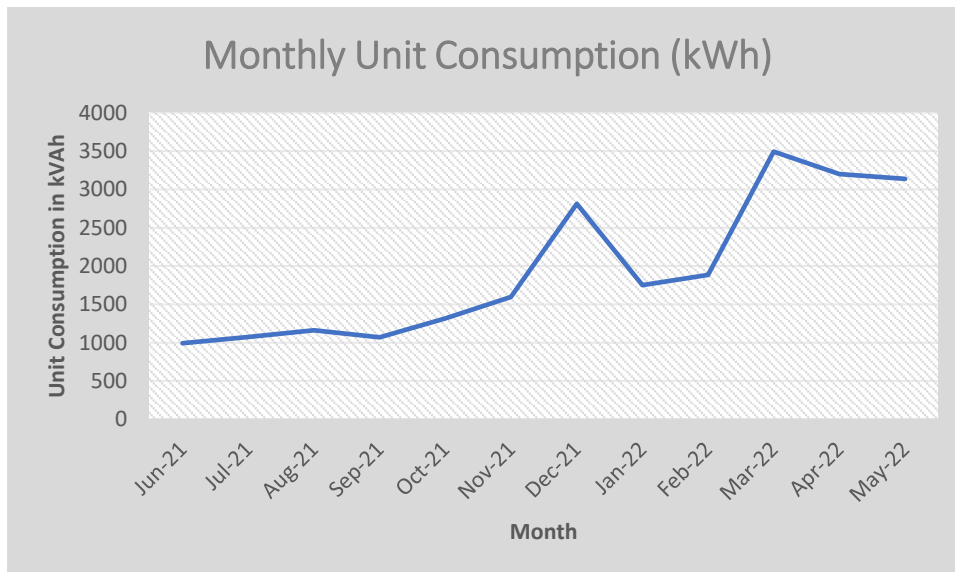
An energy audit is an inspection, survey and analysis of energy flows, for energy conservation in a building, process or system to reduce the amount of energy input into the system without negatively affecting the output(s). In commercial and industrial real estate, an energy audit is the first step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

### 6.1 Electricity Bill Analysis

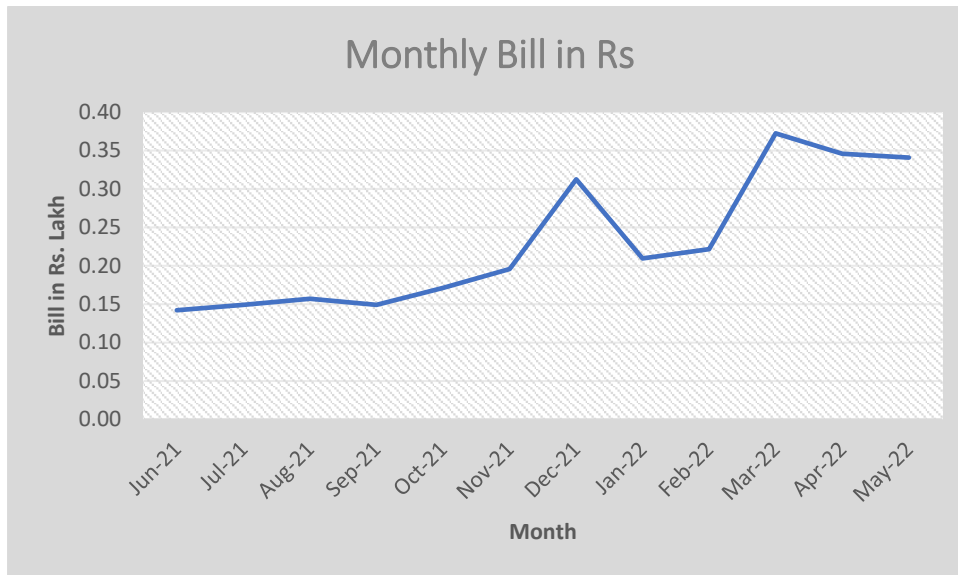
At present, one electricity meter is there for all campus. Bill analysis for the last 5 months below (Consumer number – 170147828546)

<b>Consumer Name</b>	<b>PDEA COLLAGE OF ARCHITECTURE</b>
<b>Consumer Number</b>	<b>170147828546</b>
<b>Sanctioned Load</b>	<b>30 (KW)</b>
<b>Contract Demand</b>	<b>15.2 (KVA)</b>
<b>Connected Load</b>	<b>30 (KW)</b>
<b>Tariff</b>	<b>88 LT-VII B I</b>
<b>Category</b>	<b>Commercial</b>

Below graphs shows the monthly energy consumption, Bill amount etc.



**Energy & Green Audit Report – PDEA college Of Architecture , Akurdi.**



Month	Billed Demand	Unit Consumption (Industrial)		Demand Charge	Wheeling Charges	Energy Charges	TOD Tariff EC	P.F. Inc	Tax On Sale	Charges for Excess Demand	FAC	Total Unit Consumption	Total Current Bill	Total Current Bill	Avg. Unit Rate
		kWh	kVAh												
May-22	15	3138	3407	5,760.00	4,236.30	22,687.74	186.7	0.00	597.48	0	627.60	3407	34,095.82	0.34	8.83
Apr-22	15	3199	3415	5,760.00	4,318.65	23,128.77	132.4	0.00	609.09	0	639.80	3415	34,588.71	0.35	8.81
Mar-22	15	3494	3794	5,595.00	4,821.72	25,436.32	37	0.00	665.26	0	698.80	3794	37,254.10	0.37	8.86
Feb-22	15	1884	2062	5,595.00	2,599.92	13,715.52	-105.7	0.00	358.71	0	0.00	2062	22,163.45	0.22	8.79
Jan-22	15	1750	1921	5,595.00	2,415.00	12,740.00	-114.9	0.00	333.20	0	0.00	1921	20,968.30	0.21	8.78
Dec-21	15	2811	3273	5,595.00	3,879.18	20,464.08	51.4	749.74	535.21	0	0.00	3273	31,274.61	0.31	8.87
Nov-21	15	1597	1779	5,595.00	2,203.86	11,626.16	-134.3	0.00	304.07	0	0.00	1779	19,594.79	0.20	8.77
Oct-21	15	1316	1441	5,595.00	1,816.08	9,580.48	-141.2	0.00	250.57	0	0.00	1441	17,100.93	0.17	8.74
Sep-21	15	1072	1175	5,595.00	1,479.36	7,804.16	-168.8	0.00	0.00	204.11	0.00	1175	14,913.83	0.15	8.50
Aug-21	15	1161	1270	5,595.00	1,602.18	8,452.08	-167.10	0.00	221.05	0	0.00	1270	15,703.21	0.16	8.71
Jul-21	15	1073	1184	5,595.00	1,480.74	7,811.44	-167	0.00	204.30	0	0.00	1184	14,924.48	0.15	8.69
Jun-21	15	993	1088	5,595.00	1,370.34	7,229.04	-177.5	0.00	189.07	0	0.00	1088	14,205.95	0.14	8.67
Total		<b>23488</b>	<b>18987</b>	<b>55950</b>	<b>23668</b>	<b>124859</b>	<b>-1088</b>	<b>750</b>	<b>3061</b>	<b>204.11</b>	<b>699</b>	<b>18987</b>	<b>208104</b>	<b>2.08</b>	

## 6.2 Observations& Remark

Sr.No.	Parameter	Observation	Remark
1	Contract Demand	Contract demand of the collage is 15.2 kVA	No action required
2	Sanctioned Load	Sanction load of the collage is 30 kW	No action required
3	Connected Load	Connected load of plant is 30 kW	No action required
4	Billed demand	Avg. billed demand recorded is 15 kVA	No action required
5	Unit consumption	Minimum unit consumption recorded is 993 kWh in month of Jun-21	No action required
		Avg. unit consumption recorded is 2151 Kwh	No action required
		Maximum unit consumption recorded is 3494 Kwh in month of march-22	No action required
6	Total bill	Avg. monthly electricity bill is 23,066 Rs	No action required



### 6.3 Connected Load

Location	Light Type	Qty	Wattage	Lighting Load
Admin Office	RDL LED	6	16	0.10
Registrar Cabin	RDL LED	4	16	0.06
Principal Cabin	RDL LED	10	3	0.03
Principal Cabin	RDL LED	10	16	0.16
Porch	RDL LED	29	12	0.35
1st Year Studio	LED Light	7	20	0.14
Material Museums	LED Light	6	16	0.10
Surveying Lab	LED Light	4	20	0.08
Surveying Lab	RDL LED	4	16	0.06
Workshop	LED Light	4	20	0.08
Model Making Lab	LED Light	4	20	0.08
Model Making Lab	RDL LED	4	16	0.06
Gents Toilet	LED Light	1	20	0.02
Ladies Toilet	LED Light	1	20	0.02
3rd Year Studio	FTL	9	40	0.36
Library	LED Tube	4	20	0.08
Library	FTL	1	40	0.04
Computer Lab	FTL	5	20	0.10
4rth Year Studio	FTL	4	40	0.16
New Staf Room	FTL	2	40	0.08
New Staf Room	LED Light	1	20	0.02
2 Nd Year Studio	FTL	5	40	0.20
Staf Room	FTL	3	40	0.12
Admin Office	Ceiling fan	2	70	0.14
Registrar Cabin	Ceiling fan	1	70	0.07
Principal Cabin	Ceiling fan	3	70	0.21
1st Year Studio	Ceiling fan	6	70	0.42
Material Museums	Ceiling fan	2	70	0.14
Workshop	Ceiling fan	2	70	0.14
Model Making Lab	Ceiling fan	2	70	0.14
3rd Year Studio	Ceiling fan	9	70	0.63
Library	Ceiling fan	4	70	0.28
Computer Lab	Ceiling fan	6	70	0.42
4rth Year Studio	Ceiling fan	6	70	0.42
New Staf Room	Ceiling fan	3	70	0.21
2 Nd Year Studio	Ceiling fan	4	70	0.28
Staf Room	Ceiling fan	4	70	0.28
<b>Total</b>		<b>182</b>	<b>1511</b>	<b>6</b>

## Energy & Green Audit Report – Akole Taluka Education Society's Technical Campus, Akole.

### 6.4 Energy Saving Measure 1 – Installation of LED Lights

It has been observed that conventional lights are used at different areas in college. It is recommended to replace existing conventional lighting fixtures, such as fluorescent tube lights should be replaced with 20W LED lighting system. Below table shows the estimated energy and monetary saving along with payback period.

Location	Light Type	Qty	Usage factor	Used Qty	W	Lighting Load	Hours of usage	No of Days in a month	Daily consumption (kWh)	Monthly consumption (kWh)	New W	New load kW	New monthly kWh	Monthly energy saving in kWh	Monthly monetary saving in Rs	Unit Rate of Light Fitting (Rs.)	Investment Rs	Payback period in months
Admin office	RDL LED	6	1	6	16	0.096	8.00	24.0	0.8	18	-	-	-	-	-	-	-	-
Registrar cabin	RDL LED	4	1	4	16	0.064	8.00	24.0	0.5	12	-	-	-	-	-	-	-	-
Principal cabin	RDL LED	10	1	10	3	0.030	8.00	24.0	0.2	6	-	-	-	-	-	-	-	-
Principal cabin	RDL LED	10	1	10	16	0.160	8.00	24.0	1.3	31	-	-	-	-	-	-	-	-
Porch	RDL LED	29	1	29	12	0.348	8.00	24.0	2.8	67	-	-	-	-	-	-	-	-
1st year studio	LED Light	7	1	7	20	0.140	8.00	24.0	1.1	27	-	-	-	-	-	-	-	-
Material museum	LED Light	6	1	6	16	0.096	8.00	24.0	0.8	18	-	-	-	-	-	-	-	-
Surveying lab	LED Light	4	1	4	20	0.080	8.00	24.0	0.6	15	-	-	-	-	-	-	-	-
Surveying lab	RDL LED	4	1	4	16	0.064	8.00	24.0	0.5	12	-	-	-	-	-	-	-	-
Workshop	LED Light	4	1	4	20	0.080	8.00	24.0	0.6	15	-	-	-	-	-	-	-	-
Model making lab	LED Light	4	1	4	20	0.080	8.00	24.0	0.6	15	-	-	-	-	-	-	-	-
Model making lab	RDL LED	4	1	4	16	0.064	8.00	24.0	0.5	12	-	-	-	-	-	-	-	-
Gents toilet	LED Light	1	1	1	20	0.020	8.00	24.0	0.2	4	-	-	-	-	-	-	-	-
Ladies toilet	LED Light	1	1	1	20	0.020	8.00	24.0	0.2	4	-	-	-	-	-	-	-	-

### Energy & Green Audit Report – PDEA college Of Architecture , Akurdi.

Location	Light Type	Qty	Usage factor	Used Qty	W	Lighting Load	Hours of usage	No of Days in a month	Daily consumption (kWh)	Monthly consumption (kWh)	New W	New load kW	New monthly kWh	Monthly energy saving in kWh	Monthly monetary saving in Rs	Unit Rate of Light Fitting (Rs.)	Investment Rs	Payback period in months
3rd year studio	FTL	9	1	9	40	0.360	8.00	24.0	2.9	69	20.00	0.02	35	35	311	350	3150	10
Library	LED Tube	4	1	4	20	0.080	8.00	24.0	0.6	15	-	-	-	-	-	-	-	-
Library	FTL	1	1	1	40	0.040	8.00	24.0	0.3	8	20.00	0.02	4	4	35	350	350	10
Computer lab	FTL	5	1	5	20	0.100	8.00	24.0	0.8	19	-	-	-	-	-	-	-	-
4rth year studio	FTL	4	1	4	40	0.160	8.00	24.0	1.3	31	20.00	0.02	15	15	138	350	1400	10
New Staff room	FTL	2	1	2	40	0.080	8.00	24.0	0.6	15	20.00	0.02	8	8	69	350	700	10
New Staff room	LED Light	1	1	1	20	0.020	8.00	24.0	0.2	4	-	-	-	-	-	-	-	-
2 nd year studio	FTL	5	1	5	40	0.200	8.00	24.0	1.6	38	20.00	0.02	19	19	173	350	1750	10
Staff room	FTL	3	1	3	40	0.120	8.00	24.0	1.0	23	20.00	0.02	12	12	104	350	1050	10
<b>Total</b>		<b>128</b>		<b>128</b>		<b>2.502</b>			<b>0.0</b>	<b>480</b>		<b>0.12</b>	<b>92</b>	<b>92</b>	<b>829</b>		<b>8400</b>	<b>10</b>

Energy & Green Audit Report – Akole Taluka Education Society's Technical Campus, Akole.

<b>Energy Saving in Light Replacement</b>		
<b>Parameter</b>	<b>Unit</b>	<b>Value</b>
<b>Total no. of conventional lighting fixtures installed</b>	Nos	24
<b>Estimated Monthly energy saving</b>	kWh	92
<b>Estimated Monthly carbon emission reduction</b>	Tones	0.07
<b>Estimated Monthly monetary saving</b>	Rs	829
<b>Estimated investment</b>	Rs	8400
<b>Payback period</b>	<b>Month</b>	<b>10</b>

## 6.5 Observation & Remark

Sr. No.	Area	Observation	Remark
1	PDEA college Of Architecture, Akurdi	<p>Some of the lighting in college are of conventional fluorescent type</p> <p>There are total 128 no. of lighting fixtures installed</p> <p>Total lighting load is 2.50 kW</p> <p>Monthly energy consumption of lighting is 480 units</p>	Replace the conventional lighting fixture with energy efficient LED lighting system

## Energy & Green Audit Report – Akole Taluka Education Society's Technical Campus, Akole.

### 6.6 Energy Saving Measure 2 – Energy Efficient Fans

It has been observed that conventional ceilings fans are used at different areas in college. It is recommended to replace existing 70W ceiling fans with 40W energy efficient fans. Below table shows the estimated energy and monetary saving along with payback period.

Location	Fan Type	W	Qty	kW Load	Hours of Usage	No. of Days in Month	Hrs/ Month	Daily Consumption (kWh)	Monthly Consumption (kWh)	New W	New kW	New Monthly kWh	Energy Saving in kWh	Monetary saving in Rs	Investment	Payback period in months
Admin office	Ceiling fan	70	2	0.14	8	24	192	1.12	26.88	40	0.08	15.4	11.5	104	7000	68
Registrar cabin	Ceiling fan	70	1	0.07	8	24	192	0.56	13.44	40	0.04	7.7	5.8	52	3500	68
Principal cabin	Ceiling fan	70	3	0.21	8	24	192	1.68	40.32	40	0.12	23.0	17.3	156	10500	68
1 <sup>st</sup> year studio	Ceiling fan	70	6	0.42	8	24	192	3.36	80.64	40	0.24	46.1	34.6	311	21000	68
Material museum	Ceiling fan	70	2	0.14	8	24	192	1.12	26.88	40	0.08	15.4	11.5	104	7000	68
Workshop	Ceiling fan	70	2	0.14	8	24	192	1.12	26.88	40	0.08	15.4	11.5	104	7000	68
Model making lab	Ceiling fan	70	2	0.14	8	24	192	1.12	26.88	40	0.08	15.4	11.5	104	7000	68
3 <sup>rd</sup> year studio	Ceiling fan	70	9	0.63	8	24	192	5.04	120.96	40	0.36	69.1	51.8	467	31500	68
Library	Ceiling fan	70	4	0.28	8	24	192	2.24	53.76	40	0.16	30.7	23.0	207	14000	68
Computer lab	Ceiling fan	70	6	0.42	8	24	192	3.36	80.64	40	0.24	46.1	34.6	311	21000	68
4 <sup>th</sup> year studio	Ceiling fan	70	6	0.42	8	24	192	3.36	80.64	40	0.24	46.1	34.6	311	21000	68
New Staff room	Ceiling fan	70	3	0.21	8	24	192	1.68	40.32	40	0.12	23.0	17.3	156	10500	68
2 <sup>nd</sup> year studio	Ceiling fan	70	4	0.28	8	24	192	2.24	53.76	40	0.16	30.7	23.0	207	14000	68



**Energy & Green Audit Report – PDEA college Of Architecture , Akurdi.**

Location	Fan Type	W	Qty	kW Load	Hours of Usage	No. of Days in Month	Hrs/ Month	Daily Consumption (kWh)	Monthly Consumption (kWh)	New W	New kW	New Monthly kWh	Energy Saving in kWh	Monetary saving in Rs	Investment	Payback period in months
<b>Staff room</b>	Ceiling fan	70	4	0.28	8	24	192	2.24	53.76	40	0.16	30.7	23.0	207	14000	68
			<b>54</b>	<b>3.78</b>				<b>30.24</b>	<b>725.76</b>	<b>560</b>	<b>2.16</b>	<b>414.72</b>	<b>311.04</b>	<b>2799.36</b>	<b>189000</b>	<b>68</b>

## 6.7 Observation & Remark

Sr.No	Area	Observation	Remark
1	Ceiling Fans	<p>At present, conventional ceiling fans of 70 W are installed in office, Workshop, Library and Staff room</p> <p>There are total 54 no. of ceilings fans are installed</p> <p>Total ceiling fan load is 30.24 kW</p>	<p>New energy efficient fans are available in the market which deliver same air volume at less power consumption</p> <p>It is recommended to replace existing 70 W ceiling fans with new energy efficient 40W BLDC fan</p> <p>Estimated new load of fan is 2.16 kW</p> <p>Estimated annual energy saving is 3732 units</p> <p>Estimated annual carbon emission reduction is 3.0 Tones</p> <p>Estimated annual monetary saving is Rs.0.33 Lakh</p> <p>Estimated investment is Rs.1,89,000 Lakh</p> <p>The payback period is 68 months</p>

**Fan Recommendation 1**

Replace existing 70-watt conventional ceiling fans with 40-watt energy efficient fans

<b>Parameter</b>	<b>Unit</b>	<b>Value</b>
Present fan type		Conventional ceiling fan
Present wattage of ceiling fans	watt	70
Total no. of fans installed	Nos.	54
Present load of ceiling fans	kW	3.78
Present monthly energy consumption of ceiling fans	kWh	725.76
Recommended fan type		Energy Efficient BLDC fan
New Estimated wattage of fan	watt	40
Estimated load of ceiling fan	kW	2.16
Power saving	kW	1.62
% Savings	%	43%
New Estimated monthly energy consumption	kWh	415
Estimated annual energy savings	kWh	3732
Estimated annual carbon emission reduction	Tons	3.0
Estimated annual monetary savings	Rs	33592
Estimated investment for 1 fan	Rs	3500
Estimated total investment	Rs	189000
Payback period	Months	68

## 7 Requirements of NAAC

### Alternative Energy Initiative

Percentage of power requirement met by renewable energy sources

= (Power requirement met by renewable energy sources / Total power requirement) X 100

= (0/1970) X 100

= **0%**

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

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

= (99/128) X 100

= **77 %**

## 8 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 environmentally friendly institute.

### 8.1 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

## 8.2 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



## 9 Initiatives by College towards Sustainable Environment

### 9.1 Tree Plantation

our society is facing lot of problems related to environment. Moreover, today students are more connected to people all over the world but less connected to the near and dear ones and the nature. Taking this into consideration, Nature Club in our college, sorts out some activities which help them to connect, to our 'Mother Earth'. The Nature Club conducts various activities such as Observing Plantation Day. Green and Clean Campus Campaign, Swachata Abhiyan, Plastic Collection etc., throughout the year.

#### Tree Plantation

Tree Plantation program was held in **Akhil Bharatiya Swami Samarth Dindori Pranit Kndra**, Akurdi, on 5<sup>th</sup> February 2022 at 12:30 p.m. The Students First year and Third Year Architecture actively participated in this program. College of Architecture's Principal Prof. Nishant Gawande, all Professor and Non-Teaching Staff Sapling in Akhil Bharatiya Swami Samarth Dindori Pranit Kndra Premises.





## Plantation Day

Nature Club has organized on 12th Sept 2022 at 11:00 pm 'Plantation Day'. Twenty members of Nature Club have participated in the activity. "TREE PLANTATION" Attended by PDEA COA Principal Prof. Nishant Gawande. PDEA COA Staff and Students. Maximum students are there present around 35 students 15 staff." all Professor and Non-Teaching staff actively participated in this program. Useful plants were planted Neem, Curry Leaves, Tamarind Sadabahar. Actively participation by all made it successful.

## Green And Clean Campus Campaign

A campaign on "Green and Clean Campus" was organized by members of Nature Club. The campaign was inaugurated by Prof. Nishant Gawande. They always made all efforts to shape the campus environment into an attractive display. They always considered it as their responsibility towards nature. In return they derive satisfaction from involvement in the process of tending plants.





Energy & Green Audit Report – PDEA college Of Architecture , Akurdi.







## 9.2 Alternate source of energy and energy conservation measures

Energy conservation is not a requirement, it a necessity in modern age. As fast we are going towards electronic era, where our daily life tasks are depending on electricity, we are consuming energy faster than it being made and if we think about our future generations, it is time take measures to save and conserve energy.

PDEACOA has always took this issue seriously and initiated use solar energy. We have installed multiple solar panel grids in the campus terrace area. We have also installed solar street lamps and with the help of solar energy they keep our campus secure constantly and it does not only save money, it also does not harm the environment



**Energy & Green Audit Report – PDEA college Of Architecture , Akurdi.**





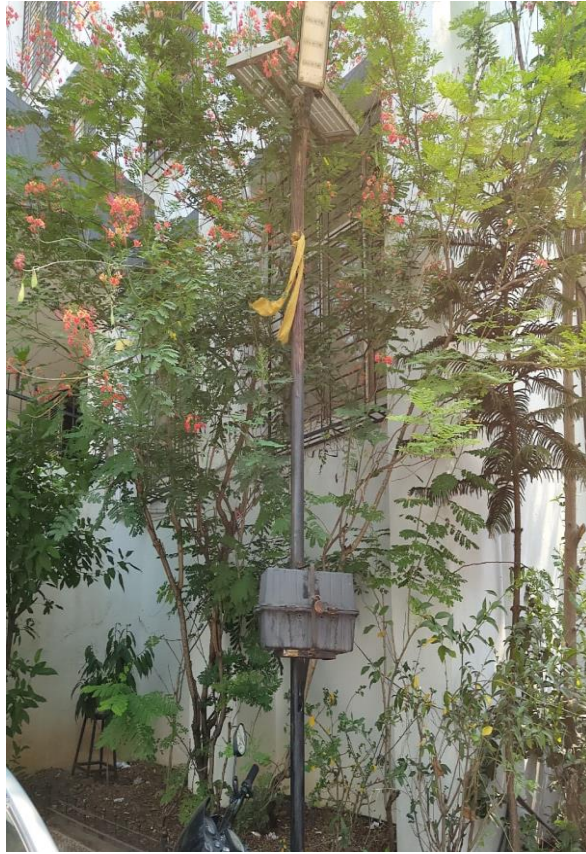


### Solar street Lamps

Solar streetlights are installed in campus to promote the use of renewable energy







### 9.3 Vermicompost Plant

College has system for creating vermicompost by the use of leaves of trees. Generated compost is then used at Garden in college campus. This is good practice adopted by college for solid waste management

Below table shows the images of vermicompost plant



#### 9.4 Rain Water Harvesting

RWH system is available in the college building where rainwater from the terrace is being taken out through the pipes. At present, collected water is being discharged to the ground and thus wasted.

It is recommended to extend the piping network to the borewell where collected water from terrace can be discharged to the bore. It will help to recharge the bore.

Below are some images of existing rain water harvesting system

