

2(f) & 12 (B): March 2006

Hanuman Shikshan Prasarak Mandal, Sonpeth's

**LATE RAMESH WARPUDKAR ARTS, COMMERCE & SCIENCE COLLEGE,  
SONPETH. DIST. PARBHANI 431516 (MS)**

**NAAC Accredited Grade 'B' with 2.03 CGPA (Validity: 02 March 2020)**

(Affiliated to: Swami Ramanand Teerth Marathwada University, Nanded)

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**Criterion 7- Institutional Values and Best Practices**

**7.1: Institutional Values and Social Responsibilities**

**7.1.3: Policy Document on Environment and Energy usage  
Certificate from the Auditing Agency**

1. GREEN AUDIT / ENVIRONMENT AUDIT
2. ENERGY AUDIT
3. CLEAN AND GREEN CAMPUS INITIATIVES
4. BEYOND THE CAMPUS ENVIRONMENTAL PROMOTION ACTIVITIES

**ENERGY AUDIT REPORT**

# ENERGY AUDIT

STUDY PERIOD (TWO YEARS) 2021 - 2022 & 2022 - 2023

Sustainability study

## AUDIT REPORT

Studied for

**Late. Ramesh WarpuDKar**  
**Arts, Commerce and Science College**

Rajabhau Kadam Nagar,  
Paali Road Sonpeth Dist. Parbhani - 431516,  
Maharashtra, India

Studied in the capacity of

Accredited and Certified  
Green Building Professional



Website: <https://thegreenviosolutions.co.in/>

Email: [greenviosolutions@gmail.com](mailto:greenviosolutions@gmail.com)

*Background reference image Janko Ferlic on pexels*



## Disclaimer

The Audit Team has prepared this report for the **Late. Ramesh Warpudkar Arts, Commerce and Science College** located at Rajabhau Kadam Nagar, Paeli Road Sonpeth Dist. Parbhani - 431516, Maharashtra, India based on input data submitted by the Institute analysed by the team to the best of their abilities.

The details have been consolidated and thoroughly studied as per the various guidelines for Green Buildings available in National and International Standards; the report has been generated based on comparative analysis of the existing facilities and the prerequisites formulated by various standards. The inputs derived are a result of the inspection and research. These will further enhance and develop a Healthy and Sustainable Institution.

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*Developing Healthy and Sustainable Environments*

We are an Environmental and Architectural Design Consultancy firm

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Palghar District, Maharashtra- 401208

[sustainableacademe@gmail.com](mailto:sustainableacademe@gmail.com)



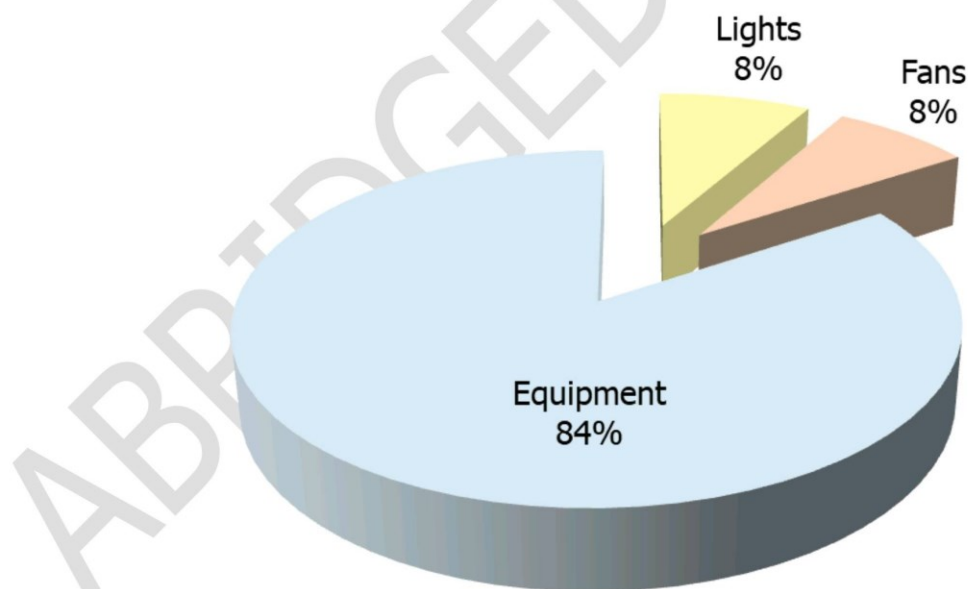
# Introduction

## About the Institute

*The Late Ramesh Warpukar ACS College, Sonpeth is in the service of the vicinity since 1994. The town Sonpeth literally means a 'Store of Gold'. The town had a significant status in the region of Nizam of Hyderabad. After independence, the town lost its administrative importance and remained neglected. This college is 80 Kms. away from district place and away from highway which resulted in slowing down its progress. Before the establishment of the college, the students of the region had to go to the district place for their higher education. The journey of the institute began with 50 students in 1994, today nearly 2000 students are studying in this campus.*

## About the Energy audit

The following documentation is based on the consumption practice of the premises on a regular working day.



**Figure 1: Summary of the calculated electrical consumption as per inventory**

The above graph shows that equipment consume 84% whereas the fans and lights consume 8% each of the total calculated electrical energy.



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The Report is prepared by the Team of Greenvio Solutions under their brand and department – Sustainable Academe as Consultancy firm with the Project Head - Ar. Nahida Shaikh who is as an Accredited and Certified Green Building Professional-Architect. Green Building consultancy is her forte and she is one of the most sought after names when it comes to providing excellent quality services within the stipulated time frame.

The Study is conducted in capacity of Accredited & Certified Green Building Professional with extensive experience.

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## Acknowledgement

The Audit Assessment Team extends its appreciation to the **Late. Ramesh Warpudkar Arts, Commerce and Science College, Maharashtra** for assigning this important work of Energy Audit. We appreciate the cooperation extended to our team during the entire process.

Our special thanks are extended are due to everyone from the Management.

Our heartfelt thanks extended to the Chairperson of the entire process **DR. V.D. Satpute**, (Principal) for the valuable inputs.

We are also thankful to Institute's Task force who have played a major role in data collection.

- Faculty members – **Mr.S. M. Devraye**. Assistant Professor (*Special mention for the excellent coordination*)
- Non-teaching staff members – **Mr. D.M. Sontakke**, Lab. Attendant
- Admin staff members – **Mr. R.R. Kale**, Jr. Clerk

We appreciate the cooperation of the **entire Teaching, Non-teaching, and Admin staff** for their support while collecting the data.

### Sustainable Academe

Brand of Greenvio Solutions, Palghar District, Maharashtra- 401208





# Contents

<b>Disclaimer .....</b>	<b>1</b>
<b>Acknowledgement .....</b>	<b>2</b>
<b>Contents.....</b>	<b>3</b>
<b>1. Introduction.....</b>	<b>4</b>
<b>2. Overview .....</b>	<b>6</b>
<b>3. Research .....</b>	<b>7</b>
<b>4. Evidence.....</b>	<b>8</b>
<b>5. Documentation .....</b>	<b>9</b>
<b>6. Suggestion .....</b>	<b>15</b>
<b>7. Compilation.....</b>	<b>17</b>



# 1. Introduction

## 1.1 About the Institute

*The Late Ramesh Warpukar ACS College, Sonpeth is in the service of the vicinity since 1994. The town Sonpeth literally means a 'Store of Gold'. The town had a significant status in the region of Nizam of Hyderabad. After independence, the town lost its administrative importance and remained neglected. This college is 80 Kms. away from district place and away from highway which resulted in slowing down its progress. Before the establishment of the college, the students of the region had to go to the district place for their higher education. The journey of the institute began with 50 students in 1994, today nearly 2000 students are studying in this campus.*

## 1.2 About the departments of the Institute

The College has departments such as Arts, English, Marathi, Hindi, Economics, Geography, History, Political Science, Physical Education, Public Administrator, Sociology.

## 1.3 Assessment of the Institute

### 1.3.1 Affiliations

The technical course provided by the College are affiliated to the **S.R.T.M.**, a a state public university of Maharashtra State.

### 1.3.2 Certification

The College has received the following Certification of **AISHE** – The All India Survey of Higher Education code with the code being C-7402.

### 1.3.3 Accreditation

The College received a 'B' grade with a CGPA of 2.03 in the 'First' cycle of accreditation awarded by the National Assessment & Accreditation Council (NAAC) in 2015.

The College is due to enter its Second cycle of NAAC.



## 1.4 Statements of the Institute

### 1.4.1 Vision

The Institute proposes "Reaching to the unreached."

### 1.4.2 Mission

The Institute adheres and focuses towards "To offer opportunities of the empowerment to the rural learners by imparting quality higher education within the capacities."

### 1.4.3 Objective

It is the objective of the College:

- To strive for imparting higher education to rural masses in general and girls in particulars
- To seek socio-cultural transformation of rural youth
- To inculcate the values like national integration, patriotism, liberty, equality, fraternity humanity and tolerance among youth
- To nurture the quality of socio and civil responsibilities among the students
- To create youth capable to be employed



## 2. Overview

### 2.1 Summarised Populace analysis for 2022-2023

#### 2.1.1 Students data

The data (shared by the Institute) shows there were **548 students**.

#### 2.1.2 Staff data

S. No.	Type	Male	Female	Total
1	Admin staff	07	00	07
2	Teaching staff	20	03	23
3	Non-Teaching staff	08	00	08
<b>Total Staff Members</b>		<b>35</b>	<b>03</b>	<b>38</b>

*Table 1: Staff data of the Institution for 2022-2023*

The staff data shows the Institute premises had **38 Staff Members**.

### 2.2 Summarised Populace analysis for 2021-2022

#### 2.2.1 Students data

The data (shared by the Institute) shows there were **579 students**.

#### 2.2.2 Staff data

S. No.	Type	Male	Female	Total
1	Admin staff	07	00	07
2	Teaching staff	20	03	23
3	Non-Teaching staff	08	00	08
<b>Total Staff Members</b>		<b>35</b>	<b>03</b>	<b>38</b>

*Table 2: Staff data of the Institution for 2021-2022*

The staff data shows the Institute premises had **38 Staff Members**.

## 3. Research

### 3.1 Site area

The Institute is spread over **2 acres**.

### 3.2 Institute Infrastructure

#### 3.2.1 Establishment

The Institute was established on **1994**.

#### 3.2.2 Spatial Organisation

- The Institute is located in a rural area.
- The campus is a clustered organization spread in built and open spaces.
- There is a pollution free and healthy environment.
- There are ample shaded areas with covered walkways etc.
- The rural set-up invites a pollution free ambience with plantations all over.

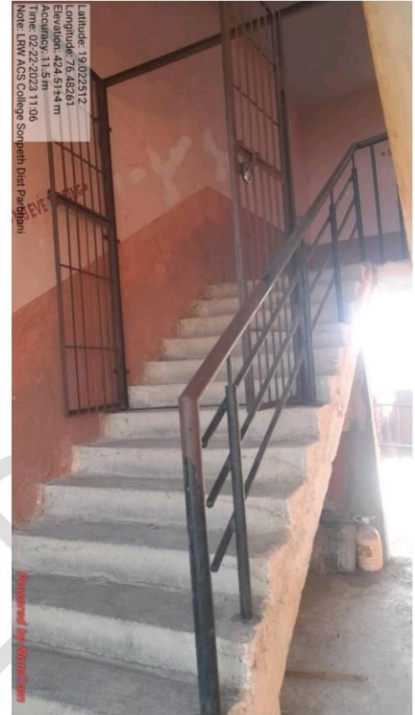
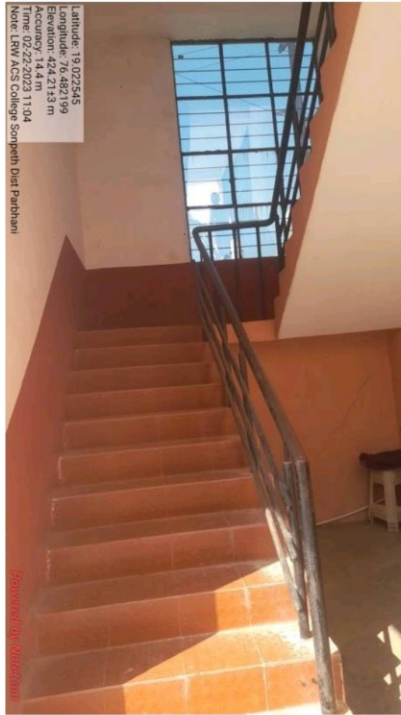
### 3.3 Operation and Maintenance of the premises

The interview session was held with the staff regarding the operation and working hours. The Institution is open from Monday to Saturday with the timings being 08:30 am to 16:00 hours.





# 4. Evidence



**Plate 1: Naturally ventilated spaces in the premises**



## 5. Documentation

### 5.1 Primary sources of energy consumption

- **Electrical (Metered)** – Light, Fans, Equipments, Pumps comprise these sources.
- **Renewable energy** – There are '**NO solar panels**' available.

### 5.2 Secondary sources of energy consumption

The premise uses the following sources for administrative and laboratory purposes.

S. No.	Name	Nos.
1	Inverters	1
2	Batteries	4
3	Gas cylinders	1

*Table 3: Details of secondary sources of energy consumption*

### 5.3 Actual electrical consumption as per bills

The details of the actual consumption of electrical units is documented below:

S. No.	Month	Year	Amount	(A) Total units consumed	(B) Solar units generated	(C = A-B) Gross units consumed after deduction
<b>Academic year 1 2021-22</b>						
1	June	2021	2,073.76	39	0	39
2	July	2021	2,615.86	39	0	39
3	August	2021	708.93	39	0	39
4	September	2021	524.86	39	0	39
5	October	2021	1,057.36	39	0	39
6	November	2021	1,589.86	39	0	39
7	December	2021	2,126.23	39	0	39
8	January	2022	2,668.89	39	0	39
9	February	2022	3,218.60	39	0	39

<b>10</b>	March	2022	614.89	39	0	39
<b>11</b>	April	2022	1,157.75	39	0	39
<b>12</b>	May	2022	1,656.20	39	0	39
<b>Academic year 2 2022-23</b>						
<b>13</b>	June	2022	2,209.21	39	0	39
<b>14</b>	July	2022	579.78	39	0	39
<b>15</b>	August	2022	1,149.26	39	0	39
<b>16</b>	September	2022	1,718.74	39	0	39
<b>17</b>	October	2022	2,291.94	39	0	39
<b>18</b>	November	2022	-902.92	488	0	488
<b>19</b>	December	2022	1,171.58	317	0	317
<b>20</b>	January	2023	3,596.08	383	0	383
<b>21</b>	February	2023	5,874.95	353	0	353
<b>22</b>	March	2023	8,199.90	360	0	360
<b>23</b>	April	2023	3,547.39	600	0	600
<b>24</b>	May	2023	7,202.59	587	0	587

**Table 4: Details of electrical consumption**

The study suggests the following:

- The average units consumed per month are comparatively low.
- The expenses spent towards monthly consumption is low too but keeping site context in mind that includes – open spaces and space on the rooftop for exploring alternate sources of energy, there is scope to include renewable or wind sources to meet the monthly expenses.
- However, the economic and structural aspects should be checked through appropriate study prior to this.



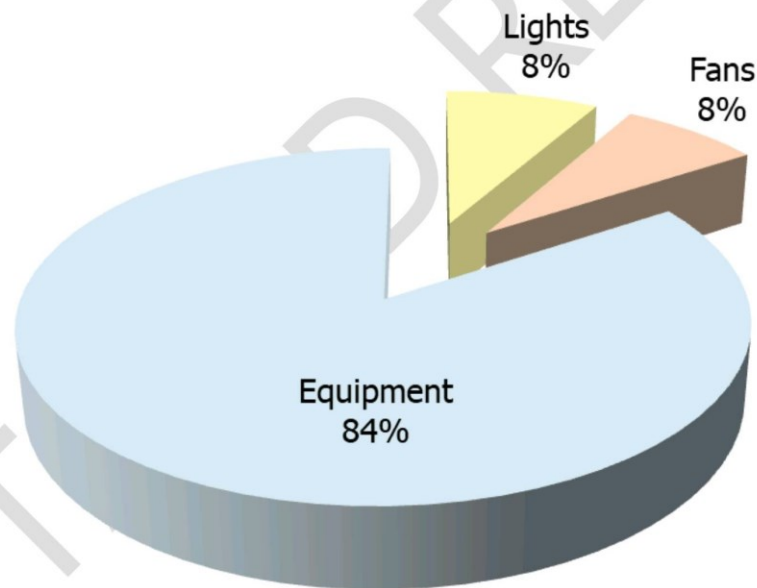


## 5.4 Calculated Electrical Consumption as per inventory

The electricity bills provide actual consumption data. The following is the calculated consumption. It is done to understand the percentage of energy usage in the premises by various applications. It is based on the inventory collected and interviews with the staff.

The additional data such as wattage is taken from market research. In terms of electrical consumption, the main sources are lights, fans, air conditioner, and equipment. The inventory and data collection for sources of energy consumed in the premise is summarised in the following sections.

The following documentation is based on the consumption practice of the premises on a regular working day.



**Figure 1: Summary of the calculated electrical consumption as per inventory**

The above graph shows that equipment consume 84% whereas the fans and lights consume 8% each of the total calculated electrical energy.



## 5.5 Lights

### 5.5.1 Types of lights based on the numbers

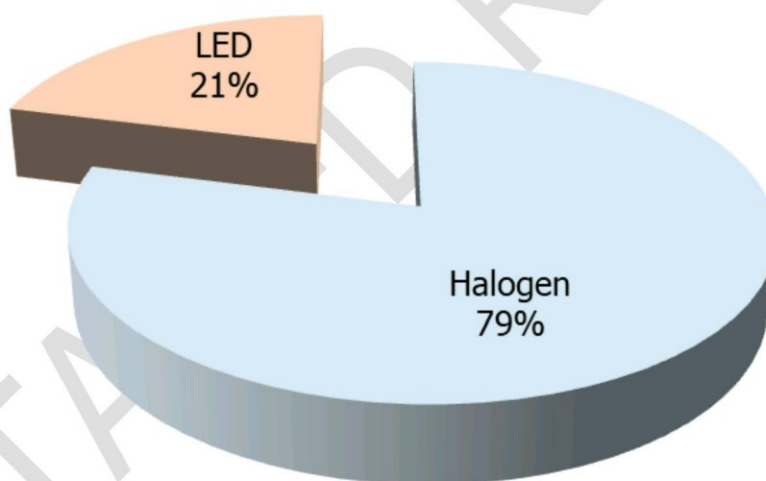
There are **57 lights on the premises**; the following table shows the various types of lights on the premises.

S. No.	Type	Nos.
1	<b>LED lights</b> (Energy efficient appliance)	34
2	<b>Halogen lights</b> (Non-Energy efficient appliance)	23

*Table 5: Summary of the types of lights on-premise*

### 5.5.2 Types of lights based on the power consumption

The energy consumption of lights is **5,205 kWh** of energy.



*Figure 2: Energy consumed by types of lights in the premise based on the usage study*

The analysis of the types of Lights on-premises shows **Halogen lights consume 79%** whereas the **LED lights consume 21%** of the total power consumed by lights.



## 5.6 Fans

### 5.6.1 Types of fans based on the numbers

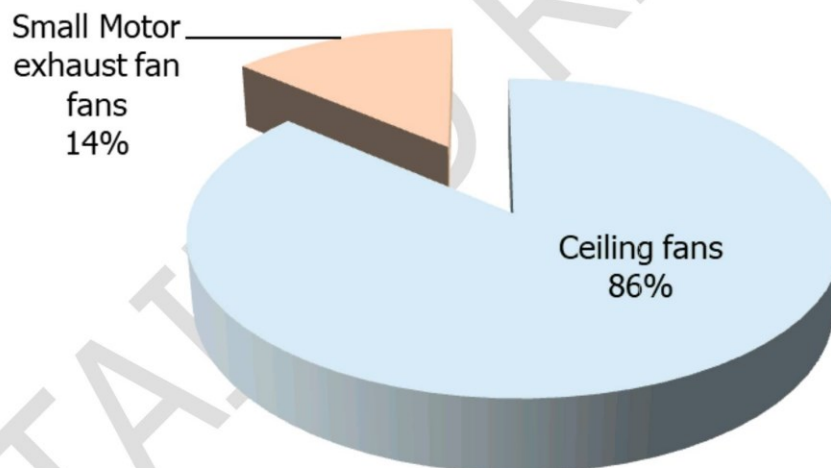
There are **58 fans** on the premises as follows:

S. No.	Type	Nos.
1	Ceiling fans	51
2	Small Motor exhaust fan fans	07

*Table 6: Summary of the types of fans in the premises*

### 5.6.2 Types of fans based on the power consumption

The energy consumption of fans is **4,752 kWh** of the energy.



*Figure 3: Types of fans based on power consumption*

The above analysis shows **Ceiling fans consume 86%** whereas the **small motor exhaust fans consume 14%** of the total power consumed by fans.



## 5.7 Air conditioners

There are no air conditioners and no energy consumed by the said source.

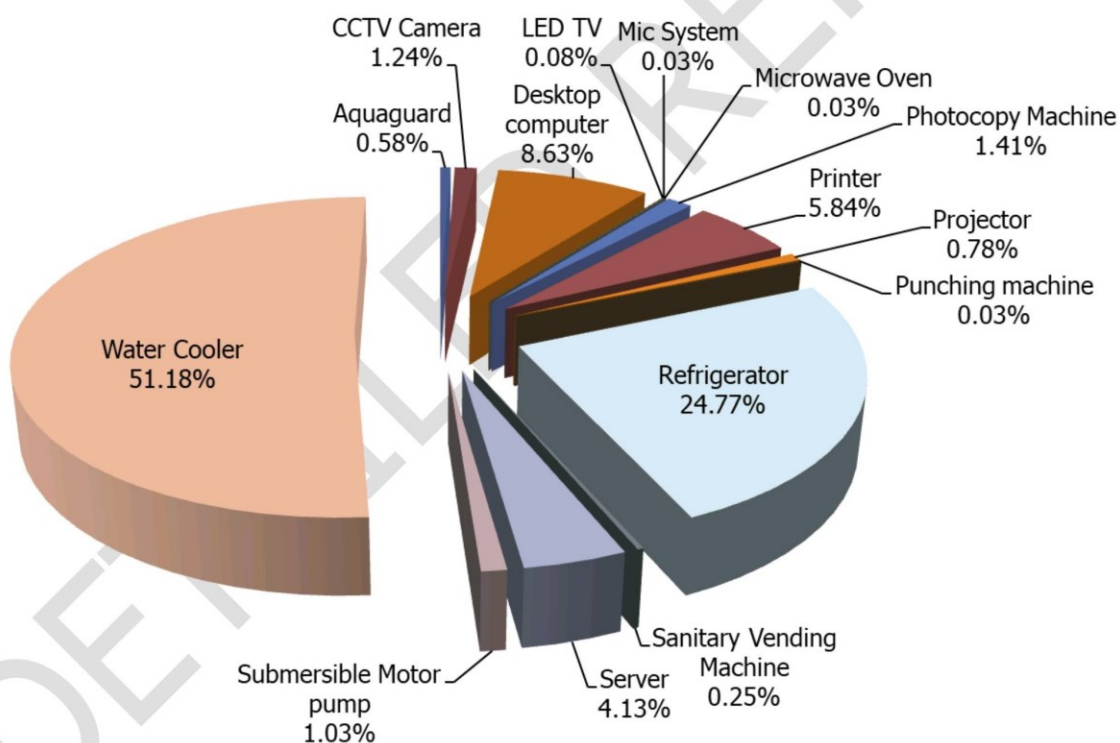
## 5.8 Equipment

### 5.8.1 Types of Equipment

There are **56 nos. of equipment** in the Educational sector.

### 5.8.2 Types of equipment as per their energy contribution

The energy consumption of equipment is **53,057 kWh** of energy.



**Figure 4: Energy consumed by types of equipment in the educational sector based on the usage study**

The above summary shows that the **water cooler consumes more energy at 51.18%** while the **refrigerator consumes 24.77%** whereas the **desktop computer consumes 8.63%** and the **server consumes 4.13%** these are the maximum consumers as compared to other equipment.



## 6. Suggestion

### 6.1 Section-wise suggestions

The following suggestions are to be considered as a ***first priority*** to be executed within the next 1.5 to 2.5 years from the date of the Report submission.

#### 6.1.1 Electromechanical systems - Electrical and Lighting

##### Section 1 - Non-energy efficient lights

The current light analysis shows that Non- energy efficient lights consume approx. 100W and even more when in use; these should be replaced with LED lights which consume on an average 18W when in use. Our technical research shows that there would be a reduction of an average of **82% reduction** in energy consumption if replaced with energy efficient appliance. It will be suggested to either replace these now if the Institute can have certain plans else the replacement can be done when fans get damaged or are not in working condition.

##### Section 2 - Ceiling fans

The current Fans are in proper working conditions and maintained well. The ceiling fans are in more quantity and consume at least 45W when in use. These should be replaced with energy efficient fans consuming 14W when in use. Our technical research shows that there would be a reduction of an average of **69% reduction** in energy consumption if replaced with energy efficient appliance. It will be suggested to either replace these now if the Institute can have certain plans else the replacement can be done when fans get damaged or are not in working condition.

### 6.2 General suggestions

The following are consolidated study related to 'entire Institute' should be considered as ***second priority*** once section wise recommendations are implemented.

Since the campus does not have any sources of alternate sources of energy, it would be highly suggestive to undertake certain measures to incorporate renewable sources of energy.

## 6.2.1 Alternatives sources to become clean and green energy campus - Solar farms

This option can be explored with due discussion with the surrounding and adjacent farmland owners. This will serve as a noble project and will provide dual benefits to farm land and Institute w.r.t to electricity bill power reduction.



*Plate 2: Solar farm concept for the Institute (For reference purpose only)*

*Source: Image by Zsuzsa Bóka from Pixabay*



DETAILED



## 7. Compilation

The study is based on the data collected, analyzed, rechecked, and confirmed through multiple modes. For the quality study, some standards/ notes have been referred to. These are listed and noted below. However, no direct references have been used anywhere. These are used as a base to analyze and study the data collected.

### Specific references for study related to energy

- <https://www.energy.gov/eere/buildings/zero-energy-buildings>
- <https://www.dsaarch.com/zero-net-positive-energy>
- U.S. Energy Information Administration
- <https://www.happysprout.com/inspiration/what-is-smart-gardening/>
- <https://housing.com/news/smart-gardening/>
- Inference study reference image

[https://seors.unfcc.int/applications/seors/attachments/get\\_attachment?code=NG125PFE4WHMWSYAK8TCAKIHMWX0F4QD](https://seors.unfcc.int/applications/seors/attachments/get_attachment?code=NG125PFE4WHMWSYAK8TCAKIHMWX0F4QD)

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