

# **Preliminary Energy, Environment & Green Audit**

**for**

**SANJIVANI RURAL EDUCATION SOCIETY CAMPUS**

**At - Sahajanandnagar, post - Shinganapur,**

**Tal-Kopargaon - 423603, Dist. Ahemadnagar**

**Prepared by**

**Practical Vision Consultants, Aurangabad**

Audit Date: 21-02-2025

## TABLE OF CONTENTS

### 1. INTRODUCTION

|                                                    |     |
|----------------------------------------------------|-----|
| 1.1 WALK THROUGH ENERGY AUDIT .....                | 3   |
| 1.2 OBJECTIVE .....                                | 4   |
| 1.3 DESCRIPTION OF SITE & SCOPE OF ASSESSMENT..... | 4   |
| 1.4 BRIEF ACCOUNT OF SITE VISIT.....               | 5-6 |

### 2. ENERGY CONSUMPTION

|                                |      |
|--------------------------------|------|
| 2.1 ANNUAL CONSUMPTION.....    | 7    |
| 2.2 MAIN ENERGY CONSUMERS..... | 8-10 |
| 2.3 ENERGY PERFORMANCE.....    | 11   |

### 3. SCOPE OF NATURAL RESOURCES CONSERVATION

|                                                                  |       |
|------------------------------------------------------------------|-------|
| 3.1 RECENT/EXISTING ENERGY SAVING & ENVIRONMENT INITIATIVES..... | 12-13 |
| 3.2 SUGGESTED OPPORTUNITIES FOR ENERGY SAVING.....               | 14    |
| 3.3 ACTIVITY METRICS.....                                        | 15    |

### 4. CONCLUSION AND NEXT STEPS

|                                                            |    |
|------------------------------------------------------------|----|
| 4.1 SANJIVANI COLLEGE MANAGEMENT COMMITMENT.....           | 16 |
| 4.2 CHECKLIST FOR ENVIRONMENT CONSCIOUSNESS IN CAMPUS..... | 16 |

|                                                                       |       |
|-----------------------------------------------------------------------|-------|
| <b><u>ANNEXTURE 1 : CAMPUS SUSTAINABILITY BEST PRACTICE</u></b> ..... | 17-18 |
|-----------------------------------------------------------------------|-------|

|                                                                               |    |
|-------------------------------------------------------------------------------|----|
| <b><u>ANNEXURE 2 : FINAL YEAR PROJECTS BY STUDENTS (AY 2024-25)</u></b> ..... | 19 |
|-------------------------------------------------------------------------------|----|

|                                              |    |
|----------------------------------------------|----|
| <b><u>ANNEXURE 3 : PHOTOGRAPHS</u></b> ..... | 20 |
|----------------------------------------------|----|

## 1. Introduction

### 1.1 Walk Through Energy Audit:

|                                          |                                                                                                |
|------------------------------------------|------------------------------------------------------------------------------------------------|
| <b>Organisation Name:</b>                | <b>SANJIVANI RURAL EDUCATION SOCIETY CAMPUS</b>                                                |
| <b>Site Name &amp; Address:</b>          | At - Sahajanandnagar,<br>Post - Shinganapur,<br>Tal - Kopargaon-423603,<br>Dist. - Ahmednagar  |
| <b>Buildings included:</b>               | Campus area of Sanjivani ACS college<br>Pharmacy college<br>College of Engineering campus area |
| <b>Date of Audit:</b>                    | Online Document Audit: 21 February 2025<br>On site Visit : 21 February 2025                    |
| <b>Walk through energy auditors</b>      | Mr. Vivekanand Koranglekar<br>Mr. Shirish Loya<br>Practical Vision Consultants,<br>Aurangabad  |
| <b>Visit Co-ordinated and Hosted by:</b> | Prof: Dr. Jadhav and Prof. Hajare                                                              |

## 1.2 Objective

This preliminary energy audit, also known as a "walk through audit," aims to evaluate the institute's efforts to raise student awareness of environmental issues and support environmental education on college campuses. It also evaluates the institute's performance in comparison to the previous year.

The following steps will be taken to accomplish this goal:

- Selecting an appropriate energy performance indicator to measure the potential for energy savings for both current and target energy use. This serves as a sense-check for computations and aids in evaluating how the energy-saving initiatives affect reaching this potential.
- Determining a set of actions, such as cost reductions and implementation budget, that when taken as a whole are large enough and have enough cumulative payback to make the project financially feasible and appropriate for execution as energy cost saving and conservation of natural resources and prevention of polluting it.
- Determining any additional requirements for metering and recording, as well as any environmental conditions that could be needed for a baseline in the event that measuring and verifying savings is required. The budget for the related installation will be estimated, allocated and utilised for implementation of necessary facilities.
- Determining the dates on the calendar each year for educating people about environmental consciousness and organizing events by coinciding those weeks with environmental conservation topics. / setting up professional talks and seminars on college campuses where students attend.

This preliminary energy audit was finished quickly by utilizing easily available site information, sector performance indicators, and common sense. It is not an investment grade audit. It is a succinct, walkthrough survey that was put together as quickly as possible using every conceivable level of skill, care, and diligence

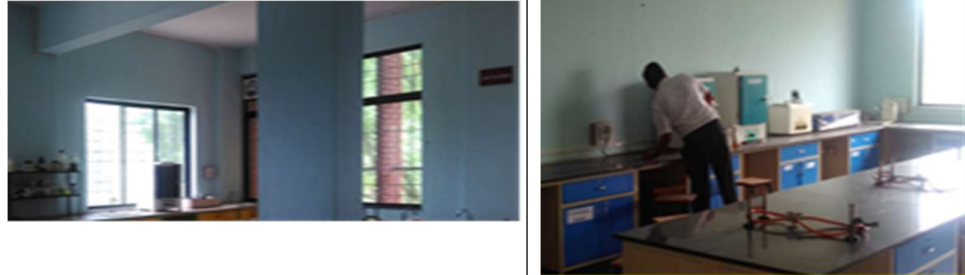
## 1.3 Description of Site & Scope of Assessment

The Site within the campus of Sanjivani Rural education society forms the scope of Assessment.

### **This assessment includes the following aspects:**

- Electricity
- Thermal Energy
- Fossil fuel
- Reusable energy resources
- Water Conservation
- Waste management

#### 1.4 Brief account of site visit as follow.

| Sr No | Site name                   | Excellent Initiatives for conservation natural resources and energy                                                                                                                                                                                             | PHOTO                                                                                |
|-------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 01    | Solar Panel installation    | Use of Solar Energy for generating electricity will help to reduce grid supplied electricity. This is now fully functional and reduction in electric bills will be reflected in next month onwards.                                                             |    |
| 02    | Solar panel supporting shed | The specially created shed to support solar panel serves dual purpose:<br>1) Firm support to panels at optimum level from ground; i.e. direct access to sunlight and ease of maintenance.<br>2) Creation of covered assembly area for various college functions |   |
| 03    | Laboratory                  | Abundant natural light coming through broad and wide windows across laboratory and lecture hall will significantly reduce the need to use fluorescent tubes, lights.                                                                                            |  |
| 04    | Lecture hall                | Excellent natural air ventilation ensures fresh air circulation in lecture hall and reduces the use of electricity for fans                                                                                                                                     |  |

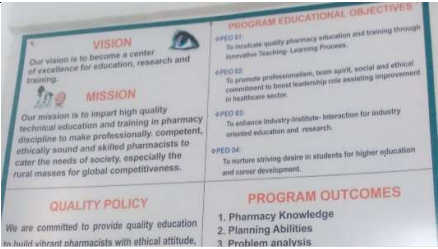
|    |                                              |                                                                                                                                                                                                                                                                    |                                                                                       |
|----|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 05 | <b>Building walls with drain water pipes</b> | Water Harvesting to capture all water on the science building roof is excellent initiative. The proper sloping arrangements on roof at different locations ensures the rain water is carried through pipelines to soak pit.                                        |    |
| 06 | <b>Soak Pit</b>                              | Rain water soak pit is created for charging ground by rain water. The soak pit can further be developed as water storage pond.                                                                                                                                     |    |
| 07 | <b>Passages</b>                              | Progressive replacement of fluorescent tubes by LED bulbs is resulting in reduced electricity consumption for illumination. The institute had made a resolve to replace every fluorescent tube by LED bulb whenever it stops working.                              |    |
| 08 | <b>Laboratory</b>                            | Enthusiastic members are planning to use the exhaust fan working on natural air current to generate electricity.... may be enough to charge cell phone batteries.                                                                                                  |   |
| 09 | <b>Exit point</b>                            | All the lecture halls, labs and offices are having one central switch at exit point to switch off all appliance in the hall.                                                                                                                                       |                                                                                       |
| 10 | <b>Display Boards</b>                        | The quality policy, environmental policy boards are displayed at prominent locations to make every member and especially new entrants, aware of institute's commitment to conserve natural resources.                                                              |  |
| 11 | <b>Biodigester</b>                           | Biogas is Eco-Friendly.<br>Biogas Generation Reduces Soil and Water Pollution.<br>Biogas Generation Produces Organic Fertilizer.<br>It's A Simple and Low-Cost Technology That Encourages A Circular Economy.<br>Healthy Cooking Alternative for Developing Areas. |  |

Table No 1: Site visit and Observation

## 2. Energy Consumption

### 2.1 Annual Energy Consumption

The data regarding electricity consumption was available for the entire campus of Sanjivani Rural Education Society. On similar lines data to be captured for all college buildings for annual energy consumption by installing sub meters for all the institutes in the campus.

Table 2: Annual Electrical Energy Consumption & Electrical Energy Costs (from January 2024 to Dec 2024) As per the MSEDL Monthly billing to the institute.

| Month & Year | Consumption (KVAH) | Solar Units Consumption | Billed Units  | Bill Amount in (Rs.) | % of Solar Units credited |
|--------------|--------------------|-------------------------|---------------|----------------------|---------------------------|
| Jan-24       | 69959              | 24739                   | 45220         | ₹ 11,53,810.00       | 35%                       |
| Feb-24       | 80448              | 24142                   | 56306         | ₹ 12,97,470.00       | 30%                       |
| Mar-24       | 101455             | 30784                   | 70671         | ₹ 15,89,480.00       | 30%                       |
| Apr-24       | 109631             | 29675                   | 79956         | ₹ 17,43,090.00       | 27%                       |
| May-24       | 99056              | 29205                   | 69851         | ₹ 16,84,540.00       | 29%                       |
| Jun-24       | 72857              | 12082                   | 60775         | ₹ 13,11,450.00       | 17%                       |
| Jul-24       | 95971              | 14064                   | 81907         | ₹ 16,48,610.00       | 15%                       |
| Aug-24       | 124856             | 16976                   | 107880        | ₹ 20,89,830.00       | 14%                       |
| Sep-24       | 139404             | 15136                   | 124268        | ₹ 23,63,000.00       | 11%                       |
| Oct-24       | 134099             | 19259                   | 114840        | ₹ 22,81,950.00       | 14%                       |
| Nov-24       | 105225             | 19962                   | 85263         | ₹ 17,78,090.00       | 19%                       |
| Dec-24       | 112016             | 12792                   | 99224         | ₹ 18,70,660.00       | 11%                       |
| <b>Total</b> | <b>1244977</b>     | <b>248816</b>           | <b>996161</b> | <b>2,08,11,980</b>   |                           |

The Total electric units consumed during January 2024 to December 2024 are 1244977 with average of 103748 units per month and solar credit contribution per month is 20734 units @ 20 % of the total electric energy requirement.

Note: Average Solar credit Contribution in Summer Season is 29% and is dropped to 14 % in Winter and Rainy Season.

## 2.2 Main Energy Consumers

The main energy consumers at the site that have been quantified for this assessment are summarised in Tables 3 below.

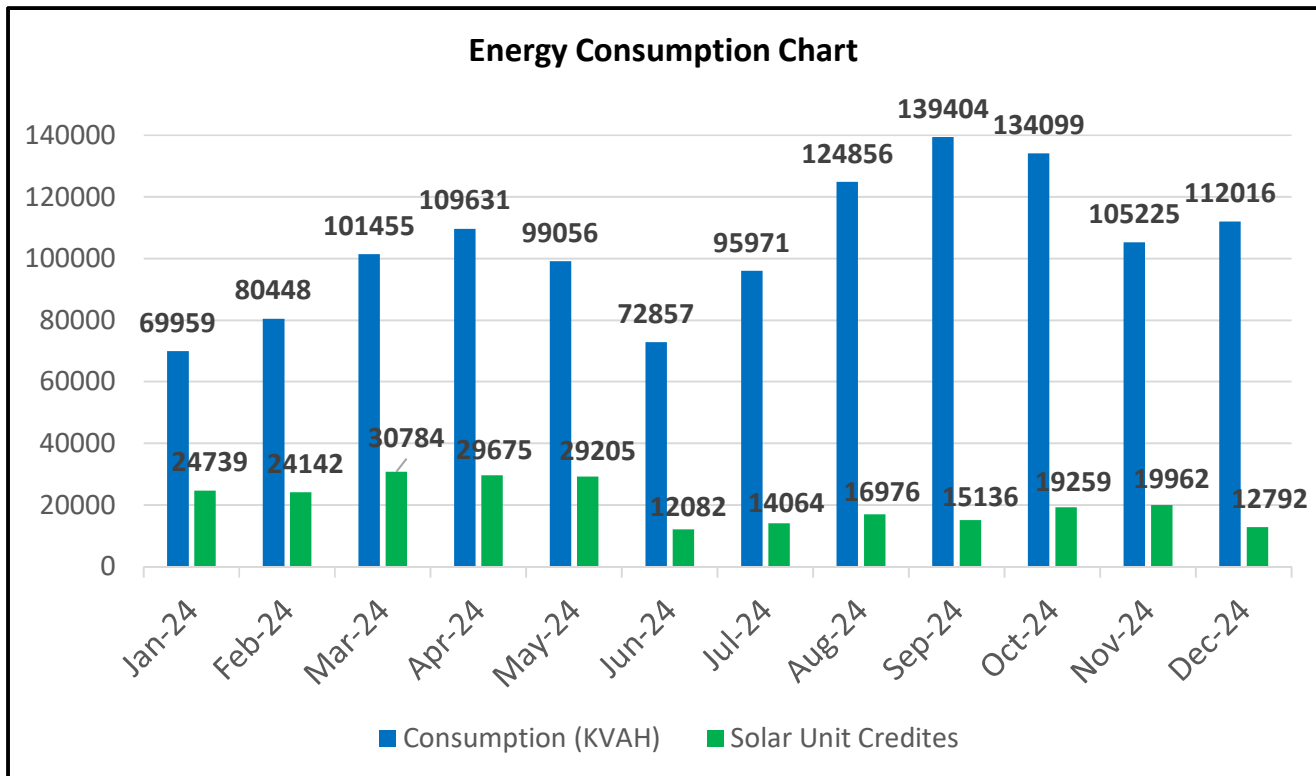
| <i>Electric Instrument wise connecting load</i> |                          |                             |                             |
|-------------------------------------------------|--------------------------|-----------------------------|-----------------------------|
| <i>Electric appliances</i>                      | <i>Total Instruments</i> | <i>Energy consume/ unit</i> | <i>Total Connected load</i> |
| <b>Led</b>                                      | 94                       | 18                          | 1692                        |
| <b>Tube light</b>                               | 2071                     | 18                          | 37278                       |
| <b>Fans</b>                                     | 1543                     | 100                         | 154300                      |
| <b>Wall mount fans</b>                          | 1                        | 80                          | 80                          |
| <b>Exhaust fans</b>                             | 62                       | 80                          | 4960                        |
| <b>Wireless routers</b>                         | 13                       | 600                         | 7800                        |
| <b>Computers</b>                                | 1100                     | 233                         | 256300                      |
| <b>Projectors</b>                               | 57                       | 600                         | 34200                       |
| <b>Printers</b>                                 | 99                       | 233.33                      | 23099.67                    |
| <b>AC</b>                                       | 31                       | 3517                        | 109027                      |
| <b>Freeze</b>                                   | 13                       | 1800                        | 23400                       |
| <b>Water Cooler</b>                             | 14                       | 1800                        | 25200                       |
| <b>Total</b>                                    | <b>5098</b>              |                             | <b>677336.7</b>             |

Table 3: Equipment wise Summary of Primary Electrical Energy Consumers

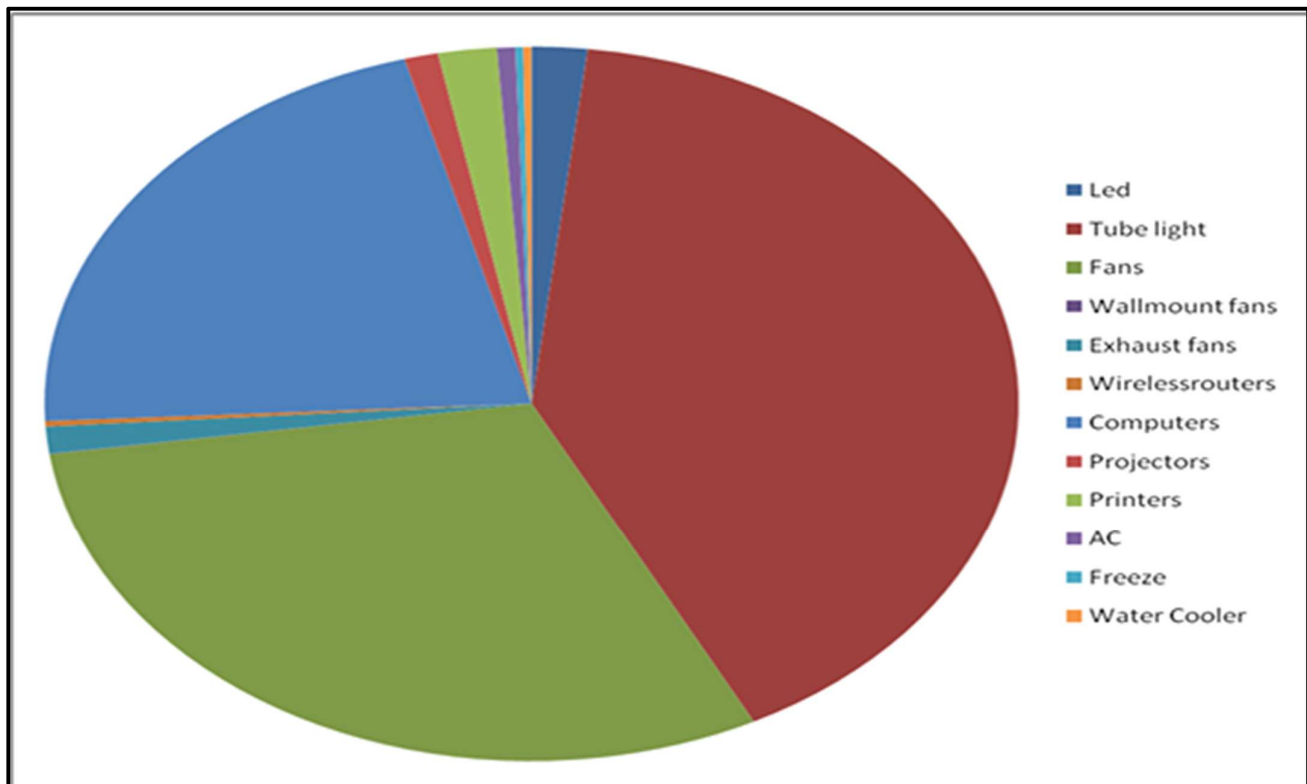
| <b>College wise Distribution of Electric Appliances</b> |                    |                    |                    |                      |              |
|---------------------------------------------------------|--------------------|--------------------|--------------------|----------------------|--------------|
| <b>College -&gt;</b>                                    | <b>B. Pharmacy</b> | <b>D. Pharmacy</b> | <b>Jr. college</b> | <b>Engg. college</b> | <b>Total</b> |
| <b>Led</b>                                              | 15                 | 2                  | 7                  | <b>70</b>            | <b>94</b>    |
| <b>Tube light</b>                                       | 139                | 40                 | 114                | <b>1778</b>          | <b>2071</b>  |
| <b>Fans</b>                                             | 110                | 40                 | 82                 | <b>1311</b>          | <b>1543</b>  |
| <b>Wall mount fans</b>                                  | 1                  | 0                  | 0                  | <b>0</b>             | <b>1</b>     |
| <b>Exhaust fans</b>                                     | 27                 | 18                 | 1                  | <b>16</b>            | <b>62</b>    |
| <b>Wireless routers</b>                                 | 1                  | 0                  | 0                  | <b>12</b>            | <b>13</b>    |
| <b>Computers</b>                                        | 52                 | 7                  | 9                  | <b>1032</b>          | <b>1100</b>  |
| <b>Projectors</b>                                       | 4                  | 2                  | 1                  | <b>50</b>            | <b>57</b>    |
| <b>Printers</b>                                         | 8                  | 4                  | 2                  | <b>85</b>            | <b>99</b>    |
| <b>AC</b>                                               | 8                  | 0                  | 0                  | <b>23</b>            | <b>31</b>    |
| <b>Freeze</b>                                           | 6                  | 3                  |                    | <b>4</b>             | <b>13</b>    |
| <b>Water Cooler</b>                                     | 1                  | 0                  | 1                  | <b>12</b>            | <b>14</b>    |
| <b>Totals</b>                                           | <b>372</b>         | <b>116</b>         | <b>217</b>         | <b>4393</b>          | <b>5098</b>  |

Table 4: College wise distribution of Electric Appliances

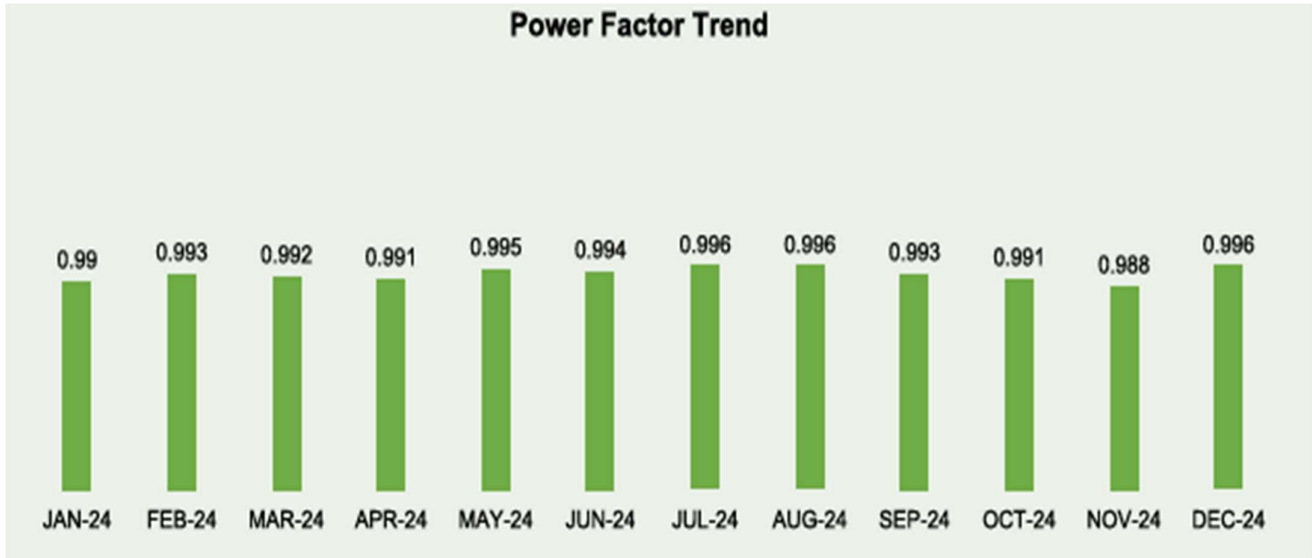
## Month Wise Electrical Energy Consumption Trend



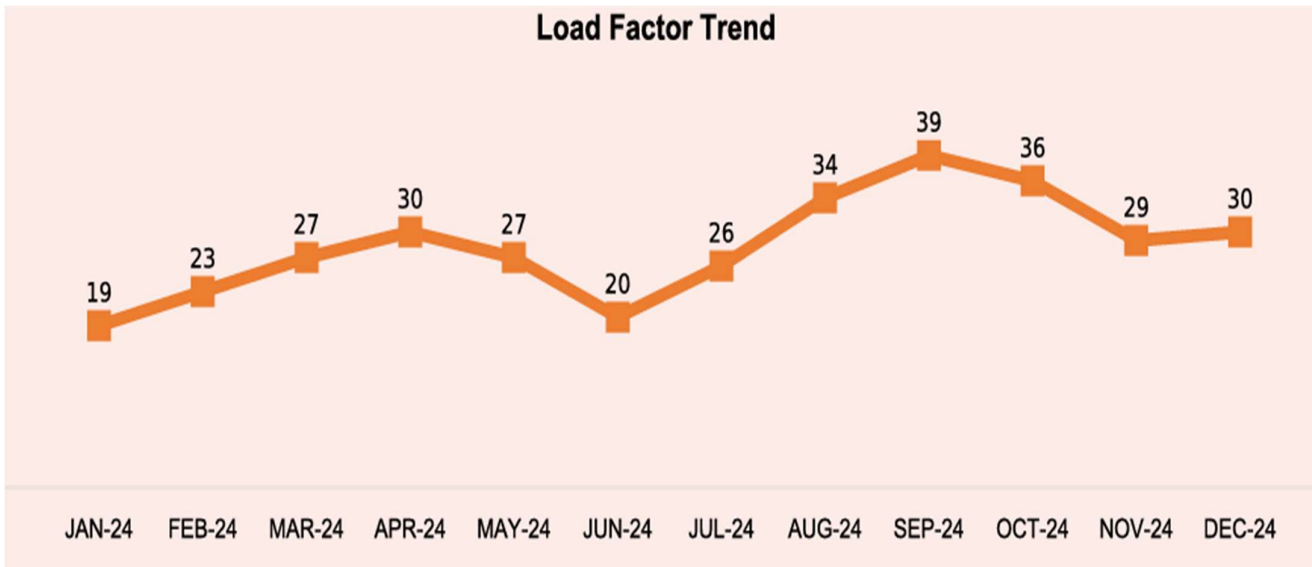
## Pie Chart of Energy Equipment Share as Per Connected Load



## Power Factor Trend



## Load Factor Trend



## 2.3 Energy Performance

The objective of this subsection is to establish how the facility is performing. The monitoring of energy performance indicator by institute will reflect the effectiveness of energy saving initiatives.

### 2.3.1 Energy Performance Indicators

As suggested in previous audit the following “Energy Performance Indicator” at the site is being monitored and shows good improvement as summarised in Tables 4 below:

| <b>Sr No</b> | <b>SRES CAMPUS<br/>Year</b> | <b>Average monthly Elec.<br/>Energy Consumption in<br/>Units</b> | <b>Population<br/>(Student +<br/>Staff)</b> | <b>Performance<br/>Indicators<br/>Units/ Student</b> |
|--------------|-----------------------------|------------------------------------------------------------------|---------------------------------------------|------------------------------------------------------|
| 1            | 2016-2017                   | 69536                                                            | 6306                                        | 11.02                                                |
| 2            | 2017-2018                   | 68047                                                            | 7043                                        | 9.66                                                 |
| 3            | 2018-2019                   | 47246                                                            | 7400                                        | 6.38                                                 |
| 4            | 2020-2021                   | 22836                                                            | 3618                                        | 6.31                                                 |
| 5            | 2022-2023                   | 76275                                                            | 7600                                        | 10.04                                                |
| 6            | 2023-2024                   | 103748                                                           | 12200                                       | 8.5                                                  |

*Table 5: Energy Performance Indicators- SRES Campus*

### 2.3.2 Benchmarks

This Benchmarks gives an indication of existing performance, the potential for further savings and a sense check for the overall savings that this audit has identified.

| <b>Monthly Running<br/>Average Usage</b> | <b>Electricity<br/>KWH</b> | <b>Average Solar Energy<br/>(KWH/ Mon)</b> | <b>Remark</b>                      |
|------------------------------------------|----------------------------|--------------------------------------------|------------------------------------|
| 2017-18                                  | 68047                      | 10000 Expected                             | Solar panel of 480 KW Installed    |
| 2018-19                                  | 47246                      | 10013                                      | @10013 solar units credited        |
| 2020 -21                                 | 22836                      | 11674                                      | @11674 solar units/ month credited |
| 2022 -23                                 | 76275                      | 24701                                      | @24701 solar units/ month credited |
| 2023-24                                  | 103748                     | 20734                                      | @20734 solar units/ month credited |

*Table No 6: Energy Benchmarks*

### 3. Scope of Natural Resources conservation

#### 3.1 Recent / Existing Energy-Saving & Environment protection Initiatives

| <b><u>Sr No</u></b> | <b>Project</b>                                                           | <b>Category</b>                                                                                        | <b>Status</b>           | <b>Impact</b>                                                                 |
|---------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------------------------------------------------------|
| 1                   | Solar Water Heater                                                       | Renewable Energy                                                                                       | Implemented             | Fuel and Electricity billing ↓                                                |
| 2                   | Solar panel 480 KWH for electricity                                      | Renewable Energy                                                                                       | Implemented             | Electricity billing ↓                                                         |
| 3                   | Rain Water Harvesting                                                    | Water                                                                                                  | Implemented             | Water consumption ↓                                                           |
| 4                   | RO reject water circulation                                              | Water                                                                                                  | Implemented             | Water consumption ↓                                                           |
| 5                   | Strom water, Waste water collection and recycling                        | Water                                                                                                  | Implemented             | Water consumption ↓                                                           |
| 6                   | Water Sprinklers                                                         | Water                                                                                                  | Implemented             | Water consumption ↓                                                           |
| 7                   | Street light timers                                                      | Electricity                                                                                            | Implemented             | Electricity billing ↓                                                         |
| 8                   | No vehicle movement in campus                                            | Fossil Fuel                                                                                            | Implemented             | Air & Noise pollution ↓                                                       |
| 9                   | Provision of bus for commuting to reduce individual vehicle usage        | Fossil Fuel                                                                                            | Implemented             | Air Pollution ↓                                                               |
| 10                  | Curriculum projects undertaken by Final Year students for Energy savings | Electricity, Renewable energy usage, Fossil fuels, Water conservation, GHG reduction, Waste management | Implemented             | As academic initiative for environment consciousness among budding engineers. |
| 11                  | Biodigester                                                              | Waste Managements                                                                                      | Implemented             | Dirt volume ↓                                                                 |
| 12                  | Sewage Treatment plant capacity 100 KLD                                  | Waste water management                                                                                 | Implemented             | Water pollution ↓                                                             |
| 13                  | Composting pit 15*15*8 meters                                            | Garden waste                                                                                           | Implemented             | Soil erosion ↓                                                                |
| 14                  | E waste management through repair, reuse, recycle                        | E waste                                                                                                | Implemented             | Soil erosion ↓                                                                |
| 15                  | Formation of Clean Technology impact club                                | Preservation & Conservation of Natural Resources                                                       | Implemented (2024-2025) | Environmental Sustainability ↑                                                |

Table No 7: List of Energy Saving & Environment Projects

## Green Field Survey

| GREEN FIELD Survey |                          |      |        |       |  |
|--------------------|--------------------------|------|--------|-------|--|
| Sr. NO.            | FRUIT TREE               | Tall | Medium | Small |  |
| 1.                 | COCONUT                  | 65   | 55     | 32    |  |
| 2.                 | MANGO                    | 5    | 11     | 20    |  |
| 3.                 | LEMON                    | 6    | -      | -     |  |
| 4.                 | BOR(JIJUPAS)             | 8    | 2      | 10    |  |
| 5.                 | DRUM STIK                | 20   | -      | -     |  |
| 6.                 | ALMOND                   | 20   | 5      | 5     |  |
| 7.                 | VILAYTI CHINCH           | 8    | -      | -     |  |
| 8.                 | Chinch                   | 15   | 07     |       |  |
| 9.                 | Karanj                   | 30   | 40     | 50    |  |
| 10.                | Bottle Brush             | 12   | 10     | 4     |  |
| 11.                | Bottle Palm              | 130  | 90     | 30    |  |
| 12.                | Suru Shrubs/ Bush        | 825  | -      | -     |  |
| 13.                | Chafa                    | 06   | 06     | 05    |  |
| 14.                | Rubber Tree              | 01   | -      | -     |  |
| 15.                | Cotton                   | 05   | 03     | 03    |  |
| 16.                | Guava (Peru Tree)        | 25   | -      | -     |  |
| 17.                | Sapota Chikku            | 15   | 60     | 5     |  |
| 18.                | Jamun                    | 5    | 12     | -     |  |
| 19.                | Custard Apple (Sitaphal) | -    | 22     | -     |  |
| 20.                | Pyrus Tree               | 80   | 50     | 50    |  |
| 21.                | SapttaPanni              | 5    | 60     | 30    |  |
| 22.                | Rain Tree                | 130  | 100    | 100   |  |
| 23.                | Kashid                   | 800  | 200    | 258   |  |
| 24.                | Pelto Form               | 600  | 100    | 40    |  |
| 25.                | Nilgiri                  | 852  | -      | -     |  |
| 26.                | Kanchan                  | -    | 80     | -     |  |
| 27.                | Sandal Wood (Chandan)    | 22   | 35     | 30    |  |
| 28.                | Bogan Wel                | -    | 225    | -     |  |
| 29.                | Morpankhi                | -    | -      | 27    |  |
| 30.                | Rudraksha                | -    | 2      | -     |  |
| 31.                | Bhadraksha               | -    | 2      | -     |  |
| 32.                | Subabul                  | 15   | 35     | 100   |  |
| 33.                | Other Flower Bushes      | -    | 510    | 900   |  |
| 34.                | Bamboo                   | -    | 50     | -     |  |

*Table No 8: Green Field Survey*

### 3.2 Suggested Opportunities for Energy savings

We identified a number of opportunities for further energy savings at the site; these are summarised as below.

Above measures for energy saving mentioned in 3.1; to be extended to other locations in campus for horizontal deployment.

Further to this, following initiatives to be taken by institute for further saving in all types of energy conservation, preservation of natural resources and protection of environment.

| <b><u>Sr No</u></b> | <b>Project</b>                                                                                                                                                        | <b>Category</b>  | <b>Status</b> | <b>Impact</b>                                                                                             |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------|-----------------------------------------------------------------------------------------------------------|
| 1                   | Replacement of Fluorescent tubes by LED bulbs                                                                                                                         | Electricity      | In progress   | Increase in Bulb life ↑ and Electricity units ↓                                                           |
| 2                   | Replacement of Window Air conditioner to Split Air Conditioners                                                                                                       | Electricity      | To Plan       | Electricity consumption reduction up to 25%.                                                              |
| 3                   | Remote sensing lighting in isolated area / non-traffic zones (Corridors / lawns, Play grounds, Halls)                                                                 | Electricity      | To Plan       | Electricity consumption↓                                                                                  |
| 4                   | Review and implement the Power Factor improvement initiatives to gain @ 0.5% savings in Energy charges.                                                               | Electricity      | To Plan       | To ensure better performance of equipment resulting in reduction of Energy consumption and Air pollution. |
| 5                   | To review the AMC with Housekeeping agency @ the disposal of wastes from campus is done as per Eco guideline and explore the possibility for re use in sugar factory. | Waste Management | To plan       | To use segregate the wastes as hazardous /Non-hazardous<br>Use of campus waste as fuel                    |
| 6                   | Review the load Factor                                                                                                                                                | Electricity      | In progress.  | To match the demand and sanction load                                                                     |

*Table No. 9: Projects identified for opportunities of Energy saving*

### **3.3 Activity Metrics**

If energy use is driven by other activities (e.g. Hostel occupancy, College Student Population, running in day/ shift), this will have to be identified.

We suggest following activity metric to be monitored by the institute:

List of activities to be captured in the activity metric may include Electric meter and sub-meter for each building as well as utility, Water meter at intake and usage points, Pollution checks, and category wise waste generation in the campus.

Identify here any activity metrics that should be recorded, Location of measurement unit, the frequency of recording interval, Responsibility of recording and monitoring and the mechanism by which they will be recorded.

#### **Activity Metrics for Energy Profile:**

We propose institute to capture the energy usage as per energy type, to monitor the energy usage in KWH and energy cost in Rupees as well as explore the feasibility of using alternative low-cost fuel. The energy types are Electricity, Diesel, Petrol, LNG, Solar, Wind, Wood, Coal etc.

## **4. Conclusion and Next Steps**

### **4.1 SANJIVANI College management commitment**

As a part of commitment to Environment consciousness, Institute has made the necessary provision of infrastructure such as Green Policy, Green Committee looking after implementation of Policy by monthly review meetings and making the Budgetary provisions for necessary Green initiatives and implementing the same.

The committee has also prepared the yearly calendar for Environmental days identified for the celebration to create the awareness for green Environment among the budding Engineers

### **4.2 Checklist for Environment Consciousness in Campus**

As a part of Environment Consciousness in the College campus on continual basis, institute is following the checklist as mentioned in the Annexure no 1.

Vivekananda Koranglekar

**Practical Vision Consultants**

## **ANNEXURE 1: Campus Sustainability Best Practices**

Primarily focuses on energy and climate change, but also includes topics such as campus waste, food, and water usage which can impact climate change.

Based on above College can formulate strategies and ensure the success of campus sustainability programs.

### **List of initiatives being undertaken by SANJIVANI RURAL EDUCATION SOCIETY CAMPUS**

as a part of Campus sustainability to check for adopting the best practices followed.

| <u>Initiatives</u>                                         |                                                                                                                                 |
|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>A. <u>Small-Scale Energy Efficiency Initiatives</u></b> |                                                                                                                                 |
| ○ Energy Competitions                                      | Preliminary work done                                                                                                           |
| ○ Computer Energy Savings                                  | Replaced by energy efficient screens                                                                                            |
| ○ Energy Efficiency in equipment                           | done                                                                                                                            |
| ○ Light Bulb Replacement                                   | done                                                                                                                            |
| ○ University Heating/Cooling Policy                        | AC temp to lock on 27 deg. Cel.                                                                                                 |
| <b>B. <u>Large-Scale Efficiency Initiatives</u></b>        |                                                                                                                                 |
| ○ Metering of Buildings                                    | Separate meters for each building are must for monitoring the impact of various energy conservation initiatives & participation |
| ○ Cogeneration                                             | Progress                                                                                                                        |
| <b>C. <u>Renewable Energy Initiatives</u></b>              |                                                                                                                                 |
| ○ Wind Energy                                              |                                                                                                                                 |
| ○ Biomass                                                  | implemented                                                                                                                     |
| ○ Solar/ Photovoltaic Energy                               | Project is now fully operational                                                                                                |
| ○ Solar Hot Water                                          | Implemented in hostel                                                                                                           |
| ○ Biomass mixed with Fossil Fuels                          | Experimentation is under progress                                                                                               |
| ○ Geothermal                                               |                                                                                                                                 |
| ○ Renewable Energy Certificates                            |                                                                                                                                 |
| ○ Carbon Offsets                                           |                                                                                                                                 |
| <b>D. <u>Transportation</u></b>                            |                                                                                                                                 |
| ○ Bicycle Initiatives                                      | No personal vehicles within campus is boosting bicycle usage                                                                    |
| ○ Commuter Programs                                        | Common buses for staff and students are already in place                                                                        |
| ○ Public Transit                                           |                                                                                                                                 |
| ○ Bio-fuels / Efficiency                                   |                                                                                                                                 |
| <b>E. <u>Food</u></b>                                      |                                                                                                                                 |
| ○ Organic and Local Food                                   |                                                                                                                                 |
| ○ Gardens and Farming                                      |                                                                                                                                 |
| ○ Waste Associated with Food                               | Bio digester plant is implemented                                                                                               |
| ○ Food Procurement and Production                          |                                                                                                                                 |
| <b>A. <u>Environmental Procurement</u></b>                 |                                                                                                                                 |
| ○ Recycled Paper, Water Bottles                            | Waste item are segregated at the point of collection                                                                            |

|                                                         |                                                                                                                                                                  |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ○ Computer Policies.                                    | Preference is accorded to procure equipment with higher BEE ratings                                                                                              |
| ○ Electrical items with higher star rating by BEE       |                                                                                                                                                                  |
| <b>B. Waste</b>                                         |                                                                                                                                                                  |
| ○ E waste Generation, Recycling and Disposal Management | Being followed, with comprehensive policy for monitoring effectiveness for incentives, promoting awareness programs for conservation and reduction. Implemented. |
| ○ Conservation Incentives                               |                                                                                                                                                                  |
| ○ Recycling Awareness Programs                          |                                                                                                                                                                  |
| ○ Reducing Consumption                                  |                                                                                                                                                                  |
| <b>C. <u>Green Building Design</u></b>                  |                                                                                                                                                                  |
| ○ White Roofs                                           | Implemented                                                                                                                                                      |
| ○ Natural ventilation                                   | Excellent implementation                                                                                                                                         |
| ○ Day lighting                                          | Excellent implementation                                                                                                                                         |
| <b>D. <u>Water and Ecological Design</u></b>            |                                                                                                                                                                  |
| ○ Green Roofs                                           | Implemented                                                                                                                                                      |
| ○ Using Native Plants                                   | Neem tree plantation observed                                                                                                                                    |
| ○ Parking Improvements                                  | Implemented                                                                                                                                                      |
| ○ Reducing Water Consumption                            | Awareness is observed                                                                                                                                            |
| ○ Rainwater Harvesting                                  | Excellent implementation                                                                                                                                         |
| <b>E. <u>Education and Outreach</u></b>                 |                                                                                                                                                                  |
| ○ Eco-Representatives                                   | Will be monitored                                                                                                                                                |
| ○ Expanding the Curriculum                              | Projects to help environment conservation, using labs for extensive analysis are observed                                                                        |
| ○ Green Laboratories                                    |                                                                                                                                                                  |
| ○ Incorporate Sustainability Awareness Early            |                                                                                                                                                                  |
| <b>K <u>Innovative Financing</u></b>                    | Management is working on it                                                                                                                                      |
| ○ Revolving Load Fund                                   |                                                                                                                                                                  |
| ○ Alumni Sustainability Fund                            |                                                                                                                                                                  |
| ○ Project Contracting / Performance Contracts           |                                                                                                                                                                  |
| <b>L <u>Clean Technology Impact Club</u></b>            | Management is working on it                                                                                                                                      |
| ○ No Poverty                                            |                                                                                                                                                                  |
| ○ No Hunger                                             |                                                                                                                                                                  |
| ○ Good Health                                           |                                                                                                                                                                  |
| ○ Quality Education                                     |                                                                                                                                                                  |
| ○ Gender Equality                                       |                                                                                                                                                                  |
| ○ Clean water and Sanitation                            |                                                                                                                                                                  |
| ○ Renewable Energy                                      |                                                                                                                                                                  |
| ○ Good jobs and Economic growth                         |                                                                                                                                                                  |
| ○ Innovation and Infrastructure                         |                                                                                                                                                                  |
| ○ Reduced Inequalities                                  |                                                                                                                                                                  |
| ○ Sustainable cities and Communities                    |                                                                                                                                                                  |
| ○ Responsible consumption                               |                                                                                                                                                                  |
| ○ Climate action                                        |                                                                                                                                                                  |
| ○ Life below water                                      |                                                                                                                                                                  |
| ○ Life on Land                                          |                                                                                                                                                                  |
| ○ Peace and Justice                                     |                                                                                                                                                                  |
| ○ Partnership for the Goals                             |                                                                                                                                                                  |

**ANNEXURE 2: Final Year Projects by Students for Environment Protection (2024-25)**

| Sr. No. | Project Title                                                                                   | Category                  | Impact                                               |
|---------|-------------------------------------------------------------------------------------------------|---------------------------|------------------------------------------------------|
| 1       | Bluetooth Controlled Solar grass Cutter and water sprinkler machine                             | Agriculture Development   | Provide human comfort and better control             |
| 2       | Fabrication of windmill, Solar charging system for laptop and mobile                            | Renewable Energy          | Increase in saving of electricity                    |
| 3       | Smart Breeze connect: Cost effective wi-fi and remote speed-controlled fan for seamless comfort | Technological Development | Provide comfort to human being                       |
| 4       | Design and implementation of PV integrated Single level DC-AC Converter (Inverter)              | Electricity               | Maximize the energy usage using PV solar panels      |
| 5       | Smart coastal waste Collection system                                                           | Environmental             | Reduction in waste, improvement in waste management  |
| 6       | Design and development of Alfa Seed sowing machine                                              | Agricultural Development  | Provide human comfort                                |
| 7       | Optimizing Ventilation and renewable energy with a wind driven power generation system          | Renewable Energy          | Reduction in consumption of fossil fuels             |
| 8       | Load flow Analysis of SCOEK using ETAP Software                                                 | Electricity               | Increase in stability and performance of equipment   |
| 9       | Detection of false reading attacks in Small net metering system                                 | Technological Development | Avoid financial losses and fair billing to customers |
| 10      | ANSYS-based design and development of axial flux permanent magnet motor                         | Electricity               | Efficient, compact and high-performance motor design |
| 11      | Gas leak shield protection                                                                      | Human Safety              | Human safety increase                                |
| 12      | Electric weed controller                                                                        | Agricultural Development  | Reduction in labor                                   |
| 13      | Smart patient healthcare system using IoT                                                       | Medical Science           | Remote monitoring of patient is possible             |
| 14      | Firefighting robotic arm system                                                                 | Human Safety              | Human safety increase                                |
| 15      | Development of intelligent Trolley system for shopping malls                                    | Technological Development | Better control of process and customer satisfaction  |
| 16      | Design and execution of bridgeless isolated Zeta-Luo converter solution for EV Charger          | Electricity               | High power factor and better efficiency              |
| 17      | A Novel stepper motor precision closing for chemical industries                                 | Electricity               | High force and high torque                           |
| 18      | Automatic seed fertilizer harvesting for smart farming                                          | Agricultural Development  | Reduction in human efforts and comfort               |
| 19      | Load forecasting using Machine learning                                                         | Electricity               | Improved accuracy in predicting electricity demands  |

### ANNEXURE 3: PHOTOGRAPHS

#### 1) STUDENT PARTICIPATION IN THE ENVIROMENTAL AWARENESS



#### 2) STUDENT PARTICIPATION IN THE ENVIROMENT PRESERVATION, PROTECTION

