



SWAMI VIVEKANAND SUBHARTI UNIVERSITY

ENERGY AUDIT REPORT

2023-2024



Prepared by
EHS ALLIANCE SERVICES

TABLE OF CONTENT

TABLE OF CONTENT	1
CERTIFICATE	2
ACKNOWLEDGEMENT	3
DISCLAIMER	4
ABBREVIATION	5
OVERVIEW OF THE UNIVERSITY	6
AUDIT PARTICIPANTS	9
EXECUTIVE SUMMARY	10
ENERGY AUDIT - ANALYSIS	10
1. ENERGY CONSUMPTION	10
1.1 Summary of Monthly Electricity Consumption and Total Bill Amount	11
2. DIESEL CONSUMPTION	12
3. ANALYSIS OF DG SETS	13
4. AC SYSTEM	15
5. FANS ANALYSIS.....	18
6. ANALYSIS OF LIGHTING SYSTEM	19
6.1 Brief description of existing system.....	19
6.2 Inventory of Lighting	19
6.3 Lux Measurement.....	20
7. OTHER POWER CONSUMPTION.....	21
7.1 Inventory of IT Infrastructure	21
7.2 Water pump details.....	24
7.3 Other Loads.....	24
8. CAPACITOR BANK.....	25

CERTIFICATE



CERTIFICATE

PRESENTED TO

SWAMI VIVEKANAND SUBHARTI UNIVERSITY

Subhartipuram, NH-58, Delhi-Haridwar, Meerut Bypass Rd, Meerut,
Uttar Pradesh 250005

That has been assessed by EHS Alliance Services for the comprehensive study of Energy
Audit on institutional working framework to fulfill the requirement of

ENERGY AUDIT

ACADEMIC YEAR 2023-24

The energy-saving initiatives carried out by the institution have been verified in the report
submitted and were found to be satisfactory.

The efforts taken by management and faculty towards all types of energy used in the
institution and sustainability are highly appreciable and noteworthy.


SIGNATURE



22.07.2024
DATE OF AUDIT

EHS ALLIANCE SERVICES, PLOT A-72, SURYA VIHAR, GURUGRAM, 122001
WWW.EHSALL.IN | BUSINESS@EHSALL.IN | EHSALLIANCE@GMAIL.COM

ACKNOWLEDGEMENT

EHS Alliance Services would like to thank the management of Swami Vivekanand Subharti University for assigning this important work of Energy Audit. We appreciate the co-operation to the teams for completion of assessment.

First of all, we would like to thank **Maj. Gen. (Dr.) Gopal Krishan Thapliyal (Retd.) - Vice Chancellor** for giving us an opportunity to evaluate the environmental performance of the campus.

We would also like to thank **Prof. (Dr.) Mukesh Ruhela, Professor & Head Department of Environmental Engineering - Audit Coordinator**, for his continuous support and guidance, without which the completion of the project would not have been possible. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

We are also thankful to

Prof. (Dr.) Shalya Raj *CEO, Subharti University*

Prof. (Dr.) Kapil Kumar *Director, IQAC*

Group Capt. M. Yakoob *Registrar*

Mr. Syed Zafar Hussain *Registrar (Academics)*



DISCLAIMER

EHS Alliance Services Energy Audit Team has prepared this Energy Audit Report for Swami Vivekanand Subharti University based on input data submitted by the representatives of college complemented with the best judgment capacity of the expert team.

While all reasonable care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

It is further informed that the conclusions are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

If you wish to distribute copies of this report external to your organization, then all pages must be included.

EHS Alliance, its staff and agents shall keep confidential all information relating to your organization and shall not disclose any such information to any third party, except that in the public domain or required by law or relevant accreditation bodies. EHS Alliance staff, agents and accreditation bodies have signed individual confidentiality undertakings and will only receive confidential information on a 'need to know' basis.



Vijay Singh
Lead Auditor EMS & Energy



Dr. Uday Pratap
Co-Auditor EMS & Energy

ABBREVIATION

A	Amps
AC	Air Conditioner
AC	Alternating Current
AMET	Academy of Maritime Education and Training
CFL	Compact fluorescent lamp
CIP	Comprehensive Inspection Program
DC	Direct Current
HSD	High Speed Diesel
Hz	Hertz
kg	Kilogram
kVA	kilo-volt-ampere
kW	kilo Watts
kWh	kilowatt hour
kWp	Kilowatt peak
LED	Light Emitting Diode
LPG	Liquefied Petroleum Gas
MMS	Module mounting structure
MPPT	Maximum Power Point Tracker
NAAC	The National Assessment and Accreditation Council
SEC	Specific Energy Consumption
SPV	Solar Photovoltaic
STC	Standard Test Condition
TV	Television
V	Volts
W	Watts
W/m²	watt per square meter

OVERVIEW OF THE UNIVERSITY

Swami Vivekanand Subharti University is a University under Section 2(f) of the University Grants Commission Act, 1956 set up under the Swami Vivekanand Subharti Vishwavidyalaya Uttar Pradesh Adhiniyam, 2008 (U.P. Act No. 29 of 2008) as passed by the Uttar Pradesh Legislature and assented to by the Hon'ble Governor of Uttar Pradesh in September 2008.

The University has been established under the aegis of Subharti K.K.B. Charitable Trust, Meerut, which has acquired a commendable record of service in the field of Education, Health care and Social welfare.

The main campus of the University is in the National Capital Region, strategically situated on National Highway 58, Delhi-Meerut-Haridwar Bypass Road, Meerut. The campus, aptly called Subhartipuram, is spread over a sprawling area of about 250 acres of land comprising magnificent buildings, lush green lawns and vibrant surroundings with over 8000 people, determined to make this a 'Jewel' in the Crown of the Nation.



The University has several constituent colleges which provide higher education in almost all the disciplines like Medical, Dental, Paramedical, Pharmacy, Engineering, Management, Law, Journalism, Education, Arts and Science, thus engaged in creating highly qualified, academically and technically proficient professionals.

The University has also started a number of courses through Distance Education, approved by Joint Committee of UGC, AICTE and DEC.



The university provides education for under graduate and post graduate courses in following departments:

ACADEMICS

- Faculty of Medicine
- Faculty of Dental Sciences
- Faculty of Nursing
- Faculty of Physiotherapy & Allied Health Sciences
- Faculty of AYUSH
- Faculty of Pharmacy
- Faculty of Law
- Faculty of Engineering & Technology
- Faculty of Science
- Faculty of Education
- Department of Education
- Department of Physical Education
- Faculty of Management & Commerce
- Subharti College of Management & Commerce
- Subharti College of Hotel Management
- Faculty of Fine Arts

ACADEMICS

- Faculty of Arts & Social Science
- Department of Journalism & Mass Comm
- Department of Languages
- Department of Library & Information Science
- Department of Home Science
- Department of Liberal Arts & Humanities
- School of Buddhist Studies
- Subharti Polytechnic College

PROGRAMS

- Undergraduate
- Postgraduate
- Ph.D. Programs
- Diploma Programs
- PG Diploma Programs
- Certificate Courses

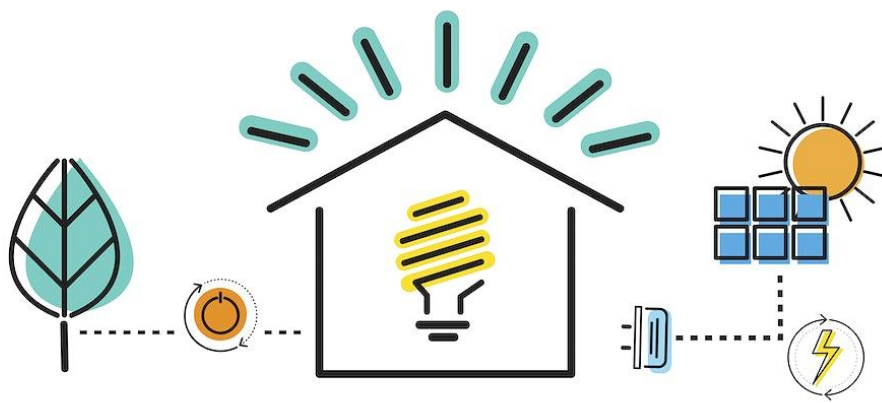
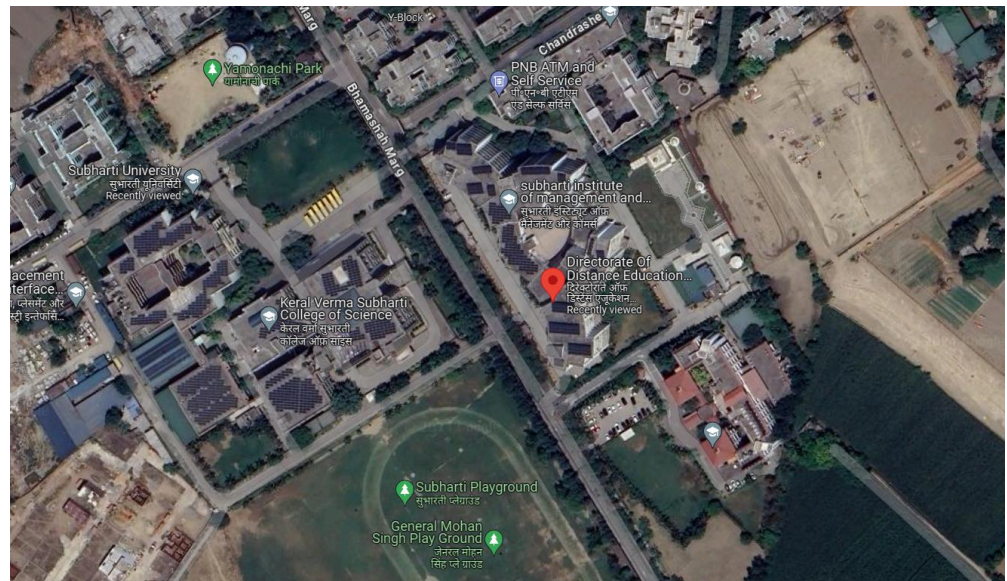
MISSION

To develop programs of the highest standards, and to produce confident, self-reliant, responsible youth having skills, social values, leadership, and entrepreneurship bent of mind in highly competitive technologically advanced, ever-changing needs of society.

VISION

To be an acclaimed University that provides contemporary Technical and Professional knowledge, skills as well as research opportunities befitting global scenarios while maintaining Service, Sacrament, and Nationality.

Geo Location
Geo Coordinates from
Google maps:
8.957292, 77.636099



energy saving

AUDIT PARTICIPANTS

On behalf of the university

Name	Designation
Maj. Gen. (Dr.) Gopal Krishan Thapliyal (Retd.)	<i>Hon'ble Vice Chancellor</i>
Prof. (Dr.) Shalya Raj	<i>CEO, Subharti University</i>
Prof. (Dr.) Kapil Kumar	<i>Director, IQAC</i>
Prof. (Dr.) Mukesh Ruhela	<i>Professor & Head Department of Environmental Engineering</i>
Group Capt. M. Yakoob	<i>Registrar</i>
Mr. Syed Zafar Hussain	<i>Registrar (Academics)</i>
Mr. Aman Sherwani	<i>Department of Mass Media</i>
Mr. Harshvardhan Kaushik	<i>Administrative Officer</i>
Er. Hari Prakash Gupta	<i>Director, Electrical</i>
Mr. Raj Kumar Sagar	<i>Transport Department</i>
Mr. Gyanendra Singh	<i>Maintenance Department</i>
Mr. Manoj Kumar	<i>Maintenance Department</i>
Mr. A.C. Pathak	<i>Manager, Horticulture</i>
Ms. Geetika Sharma	<i>Asst. Purchase Officer</i>
Mr. Vibhav Sharma	<i>Asst. Manager</i>
Mr. Inderpal	<i>Maintenance Department</i>
Mr. Vijay Kumar Nagar	<i>Civil Engineer</i>

On behalf of EHS Alliance Services

Name	Position	Qualifications
Mr. Vijay Singh	Lead Auditor	<i>M.Sc. M. Tech (Environment Science & Engineering), Energy Auditor, Post Diploma in Industrial Safety Management</i>
Dr. Uday Pratap	Co-Auditor	<i>Ph.D., EMS: Lead Auditor ISO14001:2015, QCI-WASH</i>

EXECUTIVE SUMMARY

The purpose of this Energy Audit was to seek opportunities to improve the energy efficiency of the Swami Vivekanand Subharti University. Reducing the energy consumption despite improving the human comfort, health and safety were of primary concern.

Beyond just identifying the energy consumption pattern, this audit sought to detect and categorize the most energy efficient appliances. Additionally, some daily practices relating common appliances have been shared which may help reducing the energy consumption. Data collection for energy audit of the campus was carried out by the EHS Alliance Team. The Energy Audit Report accounts for the energy consumption patterns of the institution on actual survey and detailed analysis during the audit.

The work comprehends the area wise consumption traced using suitable equipment. The analysis was carried out by our team with the support of the staff members from Swami Vivekanand Subharti University. The report provides a list of possible actions to preserve and efficiently access the available source, resources and their saving potential was also identified. We look forward towards optimization that the authorities, students and staff members would follow the recommendations in the best possible way. The report is based on certain generalizations including the approximations wherever necessary. The views conveyed may not reveal the general opinion. They merely represent the opinion of the team guided by the interviews of clients. We are happy to submit this Energy audit report to the Swami Vivekanand Subharti University.

ENERGY AUDIT - ANALYSIS

1. ENERGY CONSUMPTION

To understand the Energy Consumption trends and for analyzing the average monthly consumption we have collected electricity energy bills from July 2023 to June 2024

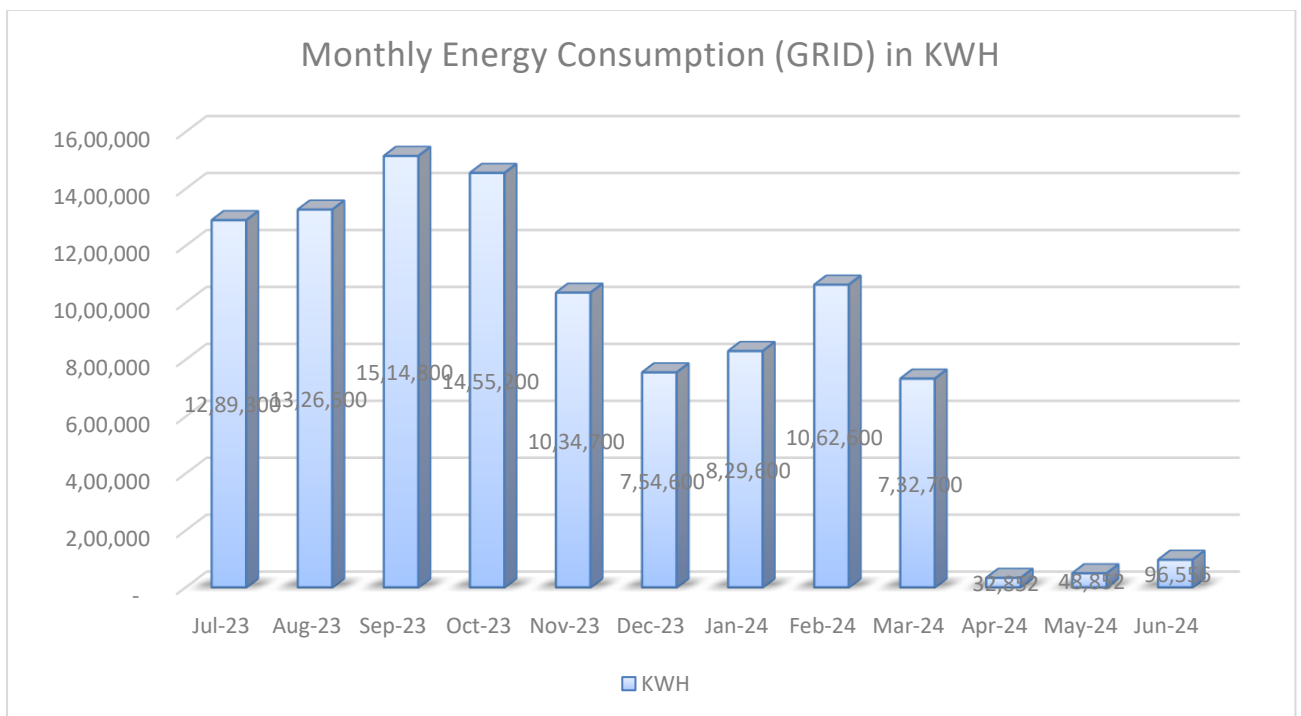
The details of “**Meter Connection**” at “**Swami Vivekanand Subharti University**” are as follows-

Name - Mahayana – Theravada-Vajryana Buddhist Religious & Charitable Trust
CA No. - 1476183000

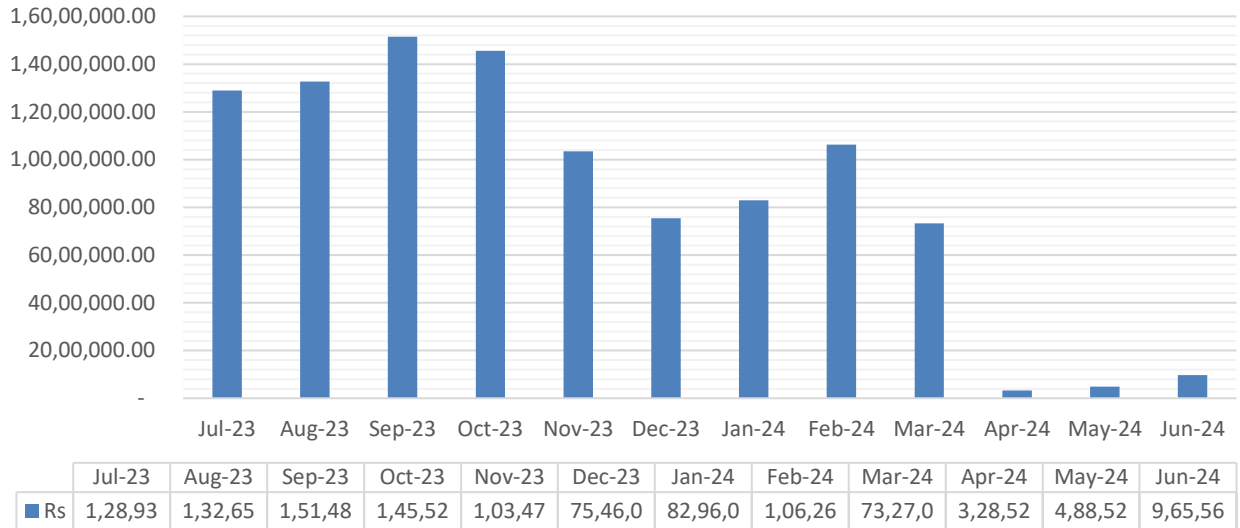
1.1 Summary of Monthly Electricity Consumption and Total Bill Amount

To understand the Energy consumption trend and for developing the baseline parameter we have collected monthly energy bill for the 12 months i.e. from July 2023 to June 2024

Month	Grid Units	Amount	Solar Units	Export kWh	Amount
Jul-23	1,289,300	10.00	205,681	0	12,893,000.00
Aug-23	1,326,500	10.00	236,076	0	13,265,000.00
Sep-23	1,514,800	10.00	223,659	0	15,148,000.00
Oct-23	1,455,200	10.00	217,508	0	14,552,000.00
Nov-23	1,034,700	10.00	134,552	0	10,347,000.00
Dec-23	754,600	10.00	138,514	0	7,546,000.00
Jan-24	829,600	10.00	97,088	0	8,296,000.00
Feb-24	1,062,600	10.00	181,613	0	10,626,000.00
Mar-24	732,700	10.00	230,536	0	7,327,000.00
Apr-24	32,852	10.00	265,646	0	328,520.00
May-24	48,852	10.00	277,944	0	488,520.00
Jun-24	96,556	10.00	248,098	0	965,560.00
SUM	10,178,260.00		2,456,915.00	-	101,782,600.00



Monthly Energy Consumption - from July 2023 to June 2024

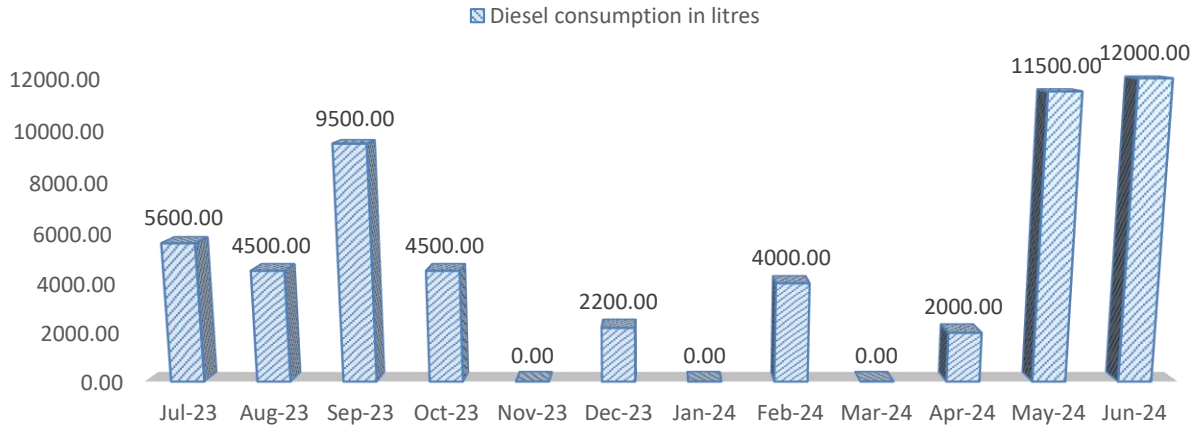


2. DIESEL CONSUMPTION

Below is the diesel consumption details in litres from July 2023 to June 2024.

Period	Diesel consumption (in litres)
Jul-23	5600.00
Aug-23	4500.00
Sep-23	9500.00
Oct-23	4500.00
Nov-23	0.00
Dec-23	2200.00
Jan-24	0.00
Feb-24	4000.00
Mar-24	0.00
Apr-24	2000.00
May-24	11500.00
Jun-24	12000.00
Total	55800.00

DIESEL CONSUMPTION (LITRES) JULY 2023 TO JUNE 2024



3. ANALYSIS OF DG SETS

In the campus, there are multiple Diesel Generator (DG) sets in different departments for its electrical power needs in case of Grid power failure. Total DG sets capacity is 8765 kVA.

DG Set Performance	Dental		Hospital	
Description	DG Station -1		DG Station -2	
Rated capacity	500 KVA	500 KVA	1500 KVA	810 KVA
Hz	50 Hz	50 Hz	50 Hz	50 Hz
Sl No.			N12K485827	N10J19297
Make	Kriloskar	Cummins	Cummins	Cummins
Volts	440 V	440 V	440 V	440 V
PF	0.85	0.85	0.85	0.85
Phase	3 Phase	3 Phase	3 Phase	3 Phase
RPM	High Speed	High Speed	High Speed 1500	1500
Amps	650A	650A	2086.8 A	1113 A
Mfg.				

DG Set Performance	Hotel Management			Mangalam Auditorium		Medical	
Description	DG Station -3			DG Station -4		DG Station -5	
Rated capacity	1250 KVA	1250 KVA	1250 KVA	1010 KVA	320 KVA	250 KVA	125 KVA

Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
Sl No.	CIK-14020650						
Make	Cummins	Cummins	Cummins	Cummins	Cummins	Cummins	Kirloskar
Volts	440 V	440 V	440 V	440 V	440 V	440 V	440 V
PF	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Phase	3 Phase	3 Phase	3 Phase	3 Phase	3 Phase	3 Phase	3 Phase
RPM	1500	1500	1500	High Speed	High Speed	High Speed	High Speed
Amps	1739 A	1739 A	1739 A	1300 A	400 A	325 A	150 A
Mfg.							

Observation and Suggestions: -

Soundproof silent generators are an efficient tool to keep both noise and vibration at low levels. For the power backup of the institution, the soundproof model is installed in the institution.

We recommend University to initiate stack monitoring of DG set through authorized lab.



Please provide photo

4. AC SYSTEM

Energy Efficiency Ratio (EER): Performance of smaller chillers and rooftop units is frequently measured in EER rather than kW/ton. EER is calculated by dividing a chiller's cooling

Capacity (in Btu/h) by its power input (in watts) at full-load conditions. The higher the EER, the More efficient the unit. The cooling effect produced is quantified as tons of refrigeration (TR). The above TR is also called as air-conditioning tonnage.

There are 1601 ACs installed in Swami Vivekanand Subharti University in various areas of various capacity which detail is given below: -

Sl No.	Location/Identification	Type(W/S)	Qty.	T R.	Room Temp. (°C)	AC-Tout (°C)	AC-Tin (°C)	Room-RH (%)	Area (m2)	Air velocity (m/s)	Enthalpy Hout	Enthalpy Hin	Heat Load in TR	KW supplied	(Eff.) Power per Ton (KW/TON)	EER
1	Hospital Building	S	25	1	24	11	20	52	0.03	2.2	22	38	0.39	1	1.61	2.18
2	Hospital Building	S	63	1.5	24	12	20	52	0.03	2.2	25	38	0.32	1.5	1.72	2.04
3	Hospital Building	S	28	2	24	11	19	52	0.03	2.6	24	37	0.38	2	1.52	2.31
4	Hospital Building	S	6	3	24	10	18	52	0.03	2.4	24	37	0.35	3	1.53	2.3
5	Hospital Building	S	7	4	23	12	20	52	0.03	2.3	25	38	0.33	4	1.67	2.11
6	Hospital Building	S	15	5.5	23	11	19	52	0.03	2	22	37	0.33	5.5	1.74	2.02
7	Hospital Building	S	3	8.5	23	13	20	52	0.03	2.3	26	38	0.31	8.5	1.74	2.02
8	Hospital Building	S	10	11	23	12	20	52	0.03	2.2	25	38	0.32	11	1.74	2.03
9	Hospital Building	S	1	16	23	12	19	52	0.03	2.3	24	37	0.33	16	1.74	2.02
10	Hospital Building	W	50	1	24	11	20	52	0.03	2.3	22	38	0.38	1	1.69	2.08
11	Hospital Building	W	206	1.5	24	12	20	53	0.03	2.5	25	38	0.34	1.5	1.79	1.97
12	Hospital Building	W	22	2	24	12	20	53	0.03	2.4	25	38	0.33	2	1.78	1.98
13	Medical College	S	12	1.5	23	12	20	52	0.03	2.5	25	38	0.34	1.5	1.86	1.89
14	Medical College	S	15	2	23	13	20	52	0.03	2.5	26	38	0.31	2	1.87	1.88
15	Medical College	W	8	1	23	12	20	52	0.03	2.5	25	38	0.34	1	1.87	1.88
16	Medical College	W	87	1.5	23	11	19	53	0.03	2.4	22	38	0.4	1.5	2.02	1.74
17	Medical College	W	18	2	22	11.5	22	52	0.03	2.1	23	43	0.44	2	1.77	1.99
18	Dental College	S	1	1	23	11	21	52	0.03	2.4	24	40	0.4	1	1.8	1.95
19	Dental College	S	25	1.5	22	10	19	52	0.03	2.2	20	37	0.39	1.5	1.99	1.77
20	Dental College	S	7	2	23	11	21	53	0.03	2.5	24	40	0.42	2	1.77	1.99
21	Dental College	W	1	1	22	12	20	52	0.03	2.6	25	38	0.35	1	2.02	1.74
22	Dental College	W	42	1.5	24	11	20	52	0.03	2.2	22	38	0.39	1.5	1.61	2.18

23	Dental College	W	5	2	24	12	20	52	0.03	2.2	25	38	0.32	2	1.72	2.04
24	Nursing college	S	5	1.5	24	11	19	52	0.03	2.6	24	37	0.38	1.5	1.52	2.31
25	Nursing college	W	8	1.5	24	10	18	52	0.03	2.4	24	37	0.35	1.5	1.53	2.3
26	Physiotherapy College	S	4	1.5	23	12	20	52	0.03	2.3	25	38	0.33	1.5	1.67	2.11
27	Physiotherapy College	W	1	1	23	11	19	52	0.03	2	22	37	0.33	1	1.74	2.02
28	Physiotherapy College	W	7	2	23	13	20	52	0.03	2.3	26	38	0.31	2	1.74	2.02
29	V. C. Office	S	3	1	23	12	20	52	0.03	2.2	25	38	0.32	1	1.74	2.03
30	V. C. Office	S	8	1.5	23	12	19	52	0.03	2.3	24	37	0.33	1.5	1.74	2.02
31	V. C. Office	S	12	2	24	11	20	52	0.03	2.3	22	38	0.38	2	1.69	2.08
32	V. C. Office	W	4	1	24	12	20	53	0.03	2.5	25	38	0.34	1	1.79	1.97
33	V. C. Office	W	6	1.5	24	12	20	53	0.03	2.4	25	38	0.33	1.5	1.78	1.98
34	V. C. Office	W	1	2	23	12	20	52	0.03	2.5	25	38	0.34	2	1.86	1.89
35	COE Office (IIIrd Floor V. Office)	S	2	1	23	13	20	52	0.03	2.5	26	38	0.31	1	1.87	1.88
36	COE Office (IIIrd Floor V. Office)	S	8	1.5	23	12	20	52	0.03	2.5	25	38	0.34	1.5	1.87	1.88
37	COE Office (IIIrd Floor V. Office)	W	7	1.5	23	11	19	53	0.03	2.4	22	38	0.4	1.5	2.02	1.74
38	S.I.T.E College, G.S. Dhollon CRIC Lab	S	4	1	22	11.5	22	52	0.03	2.1	23	43	0.44	1	1.77	1.99
39	S.I.T.E College, G.S. Dhollon CRIC Lab	S	25	1.5	23	11	21	52	0.03	2.4	24	40	0.4	1.5	1.8	1.95
40	S.I.T.E College, G.S. Dhollon CRIC Lab	S	9	2	22	10	19	52	0.03	2.2	20	37	0.39	2	1.99	1.77
41	S.I.T.E College, G.S. Dhollon CRIC Lab	W	38	1.5	23	11	21	53	0.03	2.5	24	40	0.42	1.5	1.77	1.99
42	S.I.T.E College, G.S. Dhollon CRIC Lab	W	15	2	22	12	20	52	0.03	2.6	25	38	0.35	2	2.02	1.74
43	Polytechnic College	W	8	1.5	24	11	20	52	0.03	2.2	22	38	0.39	1.5	1.61	2.18
44	Pharmacy College	S	2	1.5	24	12	20	52	0.03	2.2	25	38	0.32	1.5	1.72	2.04
45	Pharmacy College	W	3	1.5	24	11	19	52	0.03	2.6	24	37	0.38	1.5	1.52	2.31
46	Admission Cell	S	1	1	24	10	18	52	0.03	2.4	24	37	0.35	1	1.53	2.3
47	Admission Cell	S	8	1.5	23	12	20	52	0.03	2.3	25	38	0.33	1.5	1.67	2.11
48	Admission Cell	W	2	1	23	11	19	52	0.03	2	22	37	0.33	1	1.74	2.02
49	Physical Education	S	2	1.5	23	13	20	52	0.03	2.3	26	38	0.31	1.5	1.74	2.02
50	Physical Education	S	3	2	23	12	20	52	0.03	2.2	25	38	0.32	2	1.74	2.03
51	Physical Education	W	8	1.5	23	12	19	52	0.03	2.3	24	37	0.33	1.5	1.74	2.02
52	Physical Education	W	2	2	24	11	20	52	0.03	2.3	22	38	0.38	2	1.69	2.08

53	Management College	S	7	1.5	24	12	20	53	0.03	2.5	25	38	0.34	1.5	1.79	1.97
54	Management College	W	5	1.5	24	12	20	53	0.03	2.4	25	38	0.33	1.5	1.78	1.98
55	Home Science & Mass Communication	S	4	1.5	23	12	20	52	0.03	2.5	25	38	0.34	1.5	1.86	1.89
56	Home Science & Mass Communication	W	9	1.5	23	13	20	52	0.03	2.5	26	38	0.31	1.5	1.87	1.88
57	Fine Art College	S	3	1	23	12	20	52	0.03	2.5	25	38	0.34	1	1.87	1.88
58	Fine Art College	S	8	1.5	23	11	19	53	0.03	2.4	22	38	0.4	1.5	2.02	1.74
59	Fine Art College	S	2	2	22	11.5	22	52	0.03	2.1	23	43	0.44	2	1.77	1.99
60	Fine Art College	S	5	3	23	11	21	52	0.03	2.4	24	40	0.4	3	1.8	1.95
61	Fine Art College	S	3	8.5	22	10	19	52	0.03	2.2	20	37	0.39	8.5	1.99	1.77
62	Fine Art College	S	2	16	23	11	21	53	0.03	2.5	24	40	0.42	16	1.77	1.99
63	Fine Art College	W	12	1.5	22	12	20	52	0.03	2.6	25	38	0.35	1.5	2.02	1.74
64	Fine Art College	W	12	2	24	11	20	52	0.03	2.2	22	38	0.39	2	1.61	2.18
65	Biddhist College	S	14	2	24	12	20	52	0.03	2.2	25	38	0.32	2	1.72	2.04
66	Biddhist College	W	7	1.5	24	11	19	52	0.03	2.6	24	37	0.38	1.5	1.52	2.31
67	Biddhist College	W	16	2	24	10	18	52	0.03	2.4	24	37	0.35	2	1.53	2.3
68	Law College	S	2	2	23	12	20	52	0.03	2.3	25	38	0.33	2	1.67	2.11
69	Law College	W	8	1.5	23	11	19	52	0.03	2	22	37	0.33	1.5	1.74	2.02
70	Law College	W	46	2	23	13	20	52	0.03	2.3	26	38	0.31	2	1.74	2.02
71	Boy's Hostel	W	83	1.5	23	12	20	52	0.03	2.2	25	38	0.32	1.5	1.74	2.03
72	Girl's Hostel	W	339	1.5	23	12	19	52	0.03	2.3	24	37	0.33	1.5	1.74	2.02
73	Gandini Residences	W	34	1.5	24	11	20	52	0.03	2.3	22	38	0.38	1.5	1.69	2.08
74	Gandini Residences	W	88	2	24	12	20	53	0.03	2.5	25	38	0.34	2	1.79	1.97
75	Hotel Management	S	4	2	24	12	20	53	0.03	2.4	25	38	0.33	2	1.78	1.98
76	Hotel Management	W	4	1.5	23	12	20	52	0.03	2.5	25	38	0.34	1.5	1.86	1.89
77	Hotel Management	W	12	2	23	13	20	52	0.03	2.5	26	38	0.31	2	1.87	1.88
78	Gym	S	5	2	23	12	20	52	0.03	2.5	25	38	0.34	2	1.87	1.88
79	Gym	W	2	1.5	23	11	19	53	0.03	2.4	22	38	0.4	1.5	2.02	1.74
80	Gym	W	2	2	22	11.5	22	52	0.03	2.1	23	43	0.44	2	1.77	1.99

Remarks: - We have checked Energy Efficiency Ratio of AC's and EER of few AC's, and is fairly OK. But in future you should purchase 5-Star rated inverter based split AC's because power consumption of Inverter based BEE 5-Star rated AC's is less than non-star rated AC's.

Also, we recommend Swami Vivekanand Subharti University to organize periodic maintenance schedule and take corrective actions for insulating of AC's refrigerant lines in order to protect energy losses.



5. FANS ANALYSIS

In the Swami Vivekanand Subharti University, there are 11115 fans installed. The location wise details are given below.

Sl. No.	Location/ Identification	60W Ceiling Fan	45W Bracket Fan	60W Pedestal Fan
1	Dental College	702	40	8
2	Management College	740	35	6
3	Engineering College	750	31	5
4	Law College & Monglaya Auditorium	810	31	7
5	Fine Arts College	775	30	6
6	Polytechnic College	750	34	5
7	BCA College	600	35	6
8	Buddhist College	575	32	5
9	Rani Chnimimya Girl's Hostel	640	33	4
10	Bhagwati Nivedia Girl's Hostel	525	31	5
11	Rani Gurgawati Girl's Hostel	600	31	4
12	Begam Hazrat Girl's Hostel	550	32	6
13	Savitri Bai Girl's Hostel	650	34	5
14	Sangha Boy's Hostel	680	28	7
15	Madan Lal Dhingra Boy's Hostel	550	31	5
16	Veer Hakikat Rai Boy's Hostel	615	27	4
	TOTAL	10512	515	88

Observation and Suggestions: -

In the University, all the ceiling fans are of 60 W but BEE 5 Star Rated of 30W Ceiling Fans are present in the market. We recommend to consider purchasing BEE 5 Star rated 30W fans for all future purchases.

Note:- Energy saving will increase or decrease if operating hours of machine /equipment will be increased or decreased and payback period will also increase or decrease if cost of investment (Cost of machine/equipment/accessories of machine) will increase or decrease because cost of investment is taken on tentative basis.

6. ANALYSIS OF LIGHTING SYSTEM

6.1 Brief description of existing system

For assessing energy efficiency of lighting system, Inventory of the Lighting System has been noted / collected, with the aid of a lux meter, measurement and documentation of the lux levels at various locations at working level has been done.

6.2 Inventory of Lighting

Sl. No.	Location/ Identification	20W LED Tube Light	100W Street Light (LED)
1	Dental College	750	20
2	Management College	900	14
3	Engineering College	740	15
4	Law College & Monglaya Auditorium	880	18
5	Fine Arts College	830	16
6	Polytechnic College	800	17
7	BCA College	665	14
8	Buddhist College	800	16
9	Rani Chninimya Girl's Hostel	725	17
10	Bhagwati Nivedia Girl's Hostel	590	14
11	Rani Gurgawati Girl's Hostel	675	13
12	Begam Hazrat Girl's Hostel	630	16
13	Savitri Bai Girl's Hostel	780	17
14	Sangha Boy's Hostel	790	15
15	Madan Lal Dhingra Boy's Hostel	620	14
16	Veer Hakikat Rai Boy's Hostel	715	14
	TOTAL	11890	250

6.3 Lux Measurement

Description	Lux	Remark
Class Rooms	120 to 235	Acceptable
Offices	130 to 240	Acceptable
Corridors	35 to 90	Acceptable
Washrooms	45 to 76	Acceptable
Outdoor	36 to 95	Acceptable
Computer Lab	150 to 289	Acceptable
Parking area	45 to 94	Acceptable
Canteen	69 to 185	Acceptable

Observation

University has initiated LED based lighting solution, but still there are 485 (36W) tube lights. LEDs save energy, the life span is much greater and emit virtually no heat. We recommend to replace the tube lights with LEDs.

Additionally, we recommend to install motion sensor-based lights in common areas such as library, washrooms, corridors, etc.

We also recommend to use solar lights for open areas like parking, ground, street lights, etc. and motion sensor lights for common areas such as library, corridors, washrooms, etc. Table below shows the performance characteristics comparison of all luminaries.

Table - Luminous Performance Characteristics of Commonly Used Luminaries					
Type of Lamp	Lumens/Watt		Colour Rendering Index	Typical Application	Typical Life
	Range	Avg.			
Incandescent	8-18	14	Excellent (100)	Homes, restaurants, general lighting emergency lighting	1000
Fluorescent lamps	46-60	50	Good w.r.t coating (67-77)	Offices, shops, hospitals, homes	5000
Compact fluorescent Lamps (CFL)	40-70	60	Very Good (85)	Hotels, shops, homes, offices	8000-10000

High pressure mercury (HPMV)	44-57	50	Fair (45)	General lighting in factories, garages, car parking. flood lighting	5000
Halogen lamps	18-24	22	Excellent (100)	Display, flood lightening, stadium exhibition grounds, construction areas	2000 - 4000
High pressure sodium (HPSV) SON	67-121	90	Fair (22)	General lighting in ware houses, factories, street lighting	6000 - 12000
Low pressure sodium (LPSV) SOX	101-175	150	Poor (10)	Roadways, tunnels, canals, street lighting	6000 - 12000
Metal halide lamps	75-125	100	Good (70)	Industrial bays, spot lighting, flood lighting, retail stores	8000
LED Lamps	30-50	40	Good (70)	Reading lights, desk lamps, night lights, spotlights, security lights, signage lights, etc.	40000 - 100000

7. OTHER POWER CONSUMPTION

7.1 Inventory of IT Infrastructure

S/NO	Location	OFFICE PC DETAILS	PC DETAILS OF DEPTT	LAB PC DETAILS	TOTAL PC DETAILS	PROJECTOR	SERVER	PRINTER/ SCANNER
1	Faculty Of Science	5	24	61	90	20		12
2	Pharmacy College	4	8	10	22	2		6
3	Management College	4	11	40	55	14		8
4	Site College	9	44	175	228	21		12
5	Law College	11	6	25	42	13		7
6	Masscom	2	2	31	35	3		4
7	Polytechnic College	6	6	70	82	2		13
8	Fine Art College							

		14	14	60	88	4		10
9	Home Science	2	10		12	7		2
10	Buddhist Education	3	5		8	3		4
11	It Infotech	21			21	-	3	4
12	Political & Sociology	2	12	11	25	-		3
13	Distance Education	4	60		64	4	4	8
14	Ol	2	2		4	-		1
15	Fm Radio	5	2		7	-		1
16	Dental College	30	20		50	14		18
17	Nursing College	10	11	40	61	15		12
18	Physiotherapy	6	8		14	3		7
19	Naturopathy	8	30		38	4		5
20	Hotel Management	6	10	15	31	4		5
21	Paramedical	3	5	20	28	3		4
22	Medical College	13	52	14	79	14		15
23	Central Library	11		44	55	1		4
24	Exam Section	40			40	-		4
25	Account Section	62			62	-		8
26	Purchase	8			8	-		3
27	Transport	2			2	-		1
28	Maintenance	1			1	-		1
29	Construction	2			2	-		1
30	Security	2			2	-		1
31	Jim	1			1	-		-
32	Cctv Camera	5			5	-		-
33	Girsl Hostel	11			11	-		1

34	Boys Hostel	6			6	-		1
35	Legal	2			2	-		1
37	Electrical	1			1	-		1
38	Dispatch	1			1	-		1
39	Vc Office	15			15	1		1
40	Admin Block	15			15	-		8
41	Iqac	12			12	1		14
42	Ppd	7			7	-		2
43	President Office	6			6	-		3
44	Fire	1			1	-		1
45	Hospital	330			330	8	6	18
46	Cric	2	5	14	21	1		3
47	Dhillon Library	3	10	29	42	-		2
48	Defense Academy	7			7	-		
49	Foe	6	29	41	76	10		12
50	Library Science	5			5	1		8
51	Language Deptt.	6			6	1		2
52	Placement Cell	4			4	-		2
53	Polytechnic College	6	6	70	82	2		7
54	Disability	6			6	-		1
55	Security					-		1
56	Scholarship Deptt.	2			2	-		1
57	Isgr Deptt.	5			5	-		1
58	Admission Cell	14			14	-		6
	Total	777	392	770	1939	176	13	282

7.2 Water pump details

Sr. No.	Description	Unit	Pump No.- 1	Pump No.- 2
1	Rated Power of Motor	KW	33 HP	33 HP
2	Motor Eff.	%	99%	99%
3	Discharge Head	m		
4	Suction Head	m	8" Outlet	6" Outlet
5	Pump Type	Submersible/ Monoblock/ Centrifugal Etc.	Monoblock	Monoblock

7.3 Other Loads

Sl. No.	Location/ Identification	60W Exhaust Fan	160W Exhaust Fan	200W Water Cooler	180W Desert Cooler
1	Dental College	32	40	3	10
2	Management College	30	38	2	6
3	Engineering College	26	30	4	12
4	Law College & Monglaya Auditorium	20	28	3	10
5	Fine Arts College	19	29	2	7
6	Polytechnic College	18	26	4	13
7	BCA College	22	30	4	12
8	Buddhist College	19	27	3	10
9	Rani Chninimya Girl's Hostel	6	14	2	6
10	Bhagwati Nivedia Girl's Hostel	8	12	3	10
11	Rani Gurgawati Girl's Hostel	10	16	2	7
12	Begam Hazrat Girl's Hostel	9	13	4	12
13	Savitri Bai Girl's Hostel	9	17	3	9
14	Sangha Boy's Hostel	7	12	4	12
15	Madan Lal Dhingra Boy's Hostel	9	15	3	9
16	Veer Hakikat Rai Boy's Hostel	8	13	2	7
	TOTAL	252	360	48	152

ANALYSIS

There should be regular maintenance schedule of equipment like pumps, exhaust fans and IT equipment. Electronics such as computers, printers, scanners, etc. more than 3 year or 5 years (as per their life) should be replaced with new computers/laptops. Ideal Temperature should be maintained for all electronic appliances.

8. CAPACITOR BANK

Sl. No.	Location/ Identification	Capacity in KVAR
1	Dental D. G. Set 1000 KVA	320 KVAR
2	Dental D. G. Set 630 KVA	200 KVAR
3	Hospital D. G. Set 1000 KVA	320 KVAR
4	Hospital D. G. Set 1000 KVA	320 KVAR
5	Hospital D. G. Set 630 KVA	200 KVAR
6	SPICE Canteen 630 KVA	200 KVAR
7	Media 400 KVA	200 KVAR
8	Chiller Plant 1000 KVA	320 KVAR
9	Chiller Plant 1000 KVA	320 KVAR
10	Chiller Plant 1000 KVA	320 KVAR

The university is maintaining the average power factor as 0.99 and above.







***** **END OF THE REPORT** *****