



SANTHIRAM COLLEGE OF PHARMACY

Approved by AICTE & PCI, New Delhi - Affiliated to JNTUA, Anantapur
NH - 18, Nandyal, Kurnool District, Andhra Pradesh - 518501.

7.1.3(2) Energy Audit Certificate

GOVERNMENT OF ANDHRA PRADESH
DIRECTORATE OF ELECTRICAL SAFETY



From:
The Electrical Inspector,
B/B-127 & 128, B-Camp,
Near Birla Gate P.O.,
Kurnool.

M/S. SRI SHIRIDI SAI EDUCATIONAL
ACADEMY, NERAVADA VILLAGE,
PANYAM MANDAL,
NANDYAL DISTRICT.

LR. NO. EI/KNL/TECH/HT/D.NO. 995 /2022, DATED: 18-10-2022

Sir,

Sub: The Electricity Act 2003 and Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations 2010 – Electrical Installation of Voltage Exceeding 650 V of M/S. SRI SHIRIDI SAI EDUCATIONAL ACADEMY, NERAVADA VILLAGE, PANYAM MANDAL, NANDYAL DISTRICT – Statutory approval under Regulation 43 (3) of CEA (MSES) Regulations, 2010 - Accorded.

Ref: Your compliance received on: 18.10.2022

Under Regulations 43 (3) of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010, the following equipment of your Electrical Installation of voltage Exceeding 650V are approved for energization.

S.No.	Particulars of Equipment	Make	S. No.	Capacity	Voltage
I	H.V.EQUIPMENT				
1	TRANSFORMER	KIRLOSKAR	12PID104/6	500 KVA	11 KV
2	AB SWITCH	NAVEEN ELECTRICALS	-	400 A	11 KV
3	LAS	OBLUM	-	9KV, 10 KA	-
II	M.V.EQUIPMENT				
1	GENERATOR	KIRLOSKAR	28S3S10619246	160 KVA	440 V
2	MV LOAD	-	-	30 HP	440 V
3	CAPACITORS	-	-	150 KVAR	440V
III	L.V.EQUIPMENT				
1	LIGHTING LOAD	-	-	300 KW	220 V
2	AC LOAD	-	-	100 KW	220 V

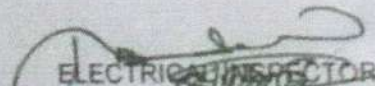
Under Regulation 43 (4) of Central Electricity Authority (Measures relating to Safety and Electric supply) Regulations, 2010, any additions or alterations of the Electric Installation shall not be connected to supply until the same are approved in writing by this office.

Under Regulation 13 (4) 46 (7) of Central Electricity Authority (Measures relating to Safety and Electric supply) Regulations, 2010, you are at all times be solely responsible for the maintenance of the above installation on such condition as to be free from danger.

The approval accorded for energizing the electrical equipment is for the safety of men and machine from electrical hazards in your installation and ipso facto does not confer any right to be used for any other purpose other than for which the approval is accorded.

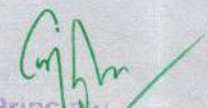
Yours faithfully,

Encl : Load List & Test Certificates.


ELECTRICAL INSPECTOR
KURNOOL

Copy to The Divisional Engineer/Operation/SPDC of AP Ltd. /NANDYAL
Copy to The Deputy Electrical Inspector, KURNOOL sub-division.




Principal
Santhiram College of Pharma
NH-40, NANDYAL

Dr. V Siva Reddy B.Tech (Mech.), M.Tech (NITT), Ph.D (IITD)
Professor & BEE Certified Energy Auditor

S.No: SRCP /EAC/01

16-08-2022

Audit Certificate

This is to certify that **M/s Santhiram College of Pharmacy, Nandyal** have successfully completed the **Energy Audit** of their buildings and campus conducted on 08 August 2022 for the year 2022. They have submitted all necessary data and credentials for scrutiny.

I congratulate the Management, Principal, Staff members, and Students for successfully completing and participating in the audit report process.

V. Siva Reddy

Signature of the Auditor



[Signature]
Principal
Santhiram College of Pharmacy
NH-40, NANDYAL

Rajeev Gandhi Memorial College of Engineering and Technology (Autonomous)
(approved by AICTE and accredited by NAAC of UGC with 'A+' Grade)
Nandyal-518501, Kurnool (DIST), Andhra Pradesh

Phone : 08514 - 276211, 276212
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Email : srcp07hc@gmail.com
srcn07hc@yahoo.com
Web : www.srcpnandyal.edu.in

SANTHIRAM COLLEGE OF PHARMACY

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NH - 18, Nandyal, Kurnool District, Andhra Pradesh - 518501.


Energy Audit Report

Energy, Environmental & Green Audit Report
of
Santhiram College of Pharmacy
Nandyal-518501



Submitted By

Dr V Siva Reddy
Energy Auditor & Professor
Certification Number EA-20245


Principal
Santhiram College of Pharmacy
NH-40, NANDYAL

Energy, Environmental & Green Audit Completion Certificate

This is certified that following utility has carried out Energy, Environmental & Green Audit as per guidelines laid down in the energy conservation, Act 2001, in the month of August 2022

Name of the Institute	Santhiram College of Pharmacy
Details Facilities Audited	All departments, laboratories, Principal office, Library, Etc.
Date of Energy, Environmental & Green Audit	August 1-16, 2022
Name of the Certified Energy Auditor	Dr V. Siva Reddy
Certification Number	EA-20245
Validity of Certificate	August 16, 2023

V. Siva Reddy

Signature of the Auditor


[Signature]
Principal
Santhiram College of Pharmacy
NH-40, NANDYAL



Executive Summary – Energy Audit

Sr. No.	Area	Proposed Action	Expected Result	Saving Potential kWh	Monetary Saving (Rs.)	Investment (Rs.)	Simple Payback Period (Months)
1	Lighting Recommendations 1-(FTL-40W)	Replace FTL-36W Conventional fitting with 1x18W Led Tube Light.	Replace the existing 36 W FTL tube lights into 18 W LED tubes <ul style="list-style-type: none"> • Total No. of light fittings = 296 Nos. • Total No. of light fittings to be replace= 232 Nos. • Present Energy Consumption = 1730 kWh • Expected Energy Consumption = 970 kWh • Total Energy Saved per Month = 1730-970= 760 kWh 	760	5814	69600	12
2	Fan system(Ceiling Fan)	Replace present ceiling fan Consuming 70W with energy efficient fans consuming 40.	Total No. of ceiling fans present = 160 Nos. <ul style="list-style-type: none"> • Total No. of ceiling fans presently operated= 160 Nos. • Total No. of ceiling fans to be replace= 160 Nos. • Present Energy Consumption = 2039 kWh • Expected Energy Consumption = 1165 kWh • Total Energy Saved per Month = 2039-1165 = 874 kWh 	874	6686	160000	24
3	AC System	Replace present AC Consuming 1800W for 1.5 TR with energy efficient AC consuming 890 W for 1.5 TR.	Total No. of AC present = 12 Nos. <ul style="list-style-type: none"> • Total No. of AC presently operated= 12 Nos. • Total No. of AC to be replace= 12 Nos. • Present Energy Consumption = 3932 kWh • Expected Energy Consumption = 1944 kWh • Total Energy Saved per Month = 3932 -1944 = 1987 kWh 	1987	15200	540000	36





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Executive Summary – Environmental Audit

Sr.No	Area	Observations	Remark
1	Air Quality	It shows that there are very less polluted particles in ambient air; AQI for Particulate matter, SO ₂ & NO ₂ parameters are within the range of Indian living standards.	There are a number of factors responsible for this cleanliness, in this area. Firstly, camps surrounded with agriculture activities. Secondly, in this area more trees have been planted as compared to other places.
2	Water Quality	The water quality indicators like Colour, Odour, Taste, Turbidity, Total Dissolved solids, Alkalinity, pH value and Chloride are within the range of Indian standard Limits.	Institute is maintaining safe and clean drinking water.
3	Noise level	Noise levels of the Institute under permissible limits (45 dB -60 dB)	The Institute is away from the city center. So, noise levels under permissible limits
4	Tree Plantation	College has carried out tree plantation activity. Several type of trees has been planted by students and staffs	Good initiative taken by college toward green campus




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Executive Summary – Green Audit

Sr.No	Area	Observations	Remark
1	Awareness and use of renewable energy	Renewable energy such as solar water heater is effectively used in college hostels and canteens Awareness program has been also carried out annually in nearby villages about use of solar energy such as solar lights, solar pumps, water heater, etc	Good initiative taken by college toward use of renewable energy
2	Solid Waste Management	At present, Waste generated by college is sent to Kowlur Panchayt, Panyam, Nandyal(DIT), Andhra Pradesh - 518501	Sewage treatment plant can be installed in future to reuse the flushed water.
3	Liquid Waste Management	At present, processing of the liquid waste water system is available and same processed water is using for gardening purpose.	Good initiative taken by college towards use of recycler
4	E waste Management	At present, E -waste generated by college is sent to Green Waves Environment, Andhra Pradesh	
5	Rain Water Harvesting	At present, rain water harvesting system of 5000 L is available in the college campus. College has planned to make enhance the capacity of the system in coming months. Also same water has been used for gardening purpose	Good initiative taken by college towards use of rain water harvesting system to make the water available in summer seasons
6	Plastic and Paper free campus	Initiative has been taken by college administrative to make the campus plastic and paper free. Most of the information is now shared to the faculty and students by email and social media applications rather than paper notice.	Good initiative by college towards to implement plastic free campus





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Acknowledgement

RGMCET Energy auditor extends gratitude to **Santhiram College of Pharmacy (SRCP)** for extending us the opportunity to conduct the Energy, Environmental & Green Audit.

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

The study team would like to acknowledge the distinguished personnel's of **Santhiram College of Pharmacy (SRCP)** in person for the diligent involvement and cooperation.

Dr. C. Madhusudhana Chetty

Principal

Dr. D.V Ashok kumar

Dean & Director

Mr. M. SivaRam

Managing Director

Dr.M.Santhiramudu

Chairman



Principal
Santhiram College of Pharmacy
NH-40, NANDYAL

About College

Santhiram College of Pharmacy (SRCP) is sponsored by M/s Sri Shirdi Sai Educational Academy, Nandyal. SRCP is established under the guidance of Dr. M. Santhiramudu, Chairman in the year 2007 with a noble motto "Education for peace and progress". Approved by AICTE & PCI, New Delhi, Recognized by Govt. of A.P. Affiliated to JNTUA, Ananthapuramu. ISO Certified 9001: 2015 Institute.

SRCP is situated on NH-40, 12 KM away from Nandyal, Andhra Pradesh. It is a learning abode for 700+ Students. The Campus is polluted free and its serene environment is ideally suited for academic activities. Santhiram College of Pharmacy, since its inception, has been performing exceptionally well to meet its goal of providing quality pharmaceutical service to society. Pharmacy education needs are increasing in society. To meet these requirements Santhiram College of Pharmacy is striving to provide the highest standards of quality pharmacy education.

The Santhiram College of Pharmacy offered courses as follows

B.Pharm course with an annual intake of 100,

M.Pharm (Pharmaceutics) with an intake of 15,

M.Pharm (Industrial Pharmacy) with an intake of 15,

M.Pharm (Pharmaceutical Analysis) with an intake of 15

M.Pharm (Pharmacology) with an intake of 15 From the academic year 2021-2022 and

Doctor of Pharmacy (Pharm.D) with an intake of 30

Vision

To produce competent professionals with sufficient professional skills, knowledge and attitude which elate global standards in Pharma Industry and Health care.

Mission

- To provide quality and value based education in Pharmaceutical sciences.
- To achieve positive patient health care outcomes.
- To produce innovators and entrepreneurs.
- To support health care and industrial needs.
- To become self sustained in Pharmacy education and Research.

Quality Policy

Strive to provide excellent pharmacy education along with practical and social exposure to the graduates through skilled and adequate professional resources to enhance their aptitude for the Pharma industry and health care profession, through consistent improvements in the quality aspects such as drug expertise education with committed research; preparation of convenient dosage form and dispensing; drug monitoring and patient counseling; sustained learning and adopting high communication skills; leadership qualities and teamwork abilities which assure with confirmed placements.

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1. Energy Audit

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

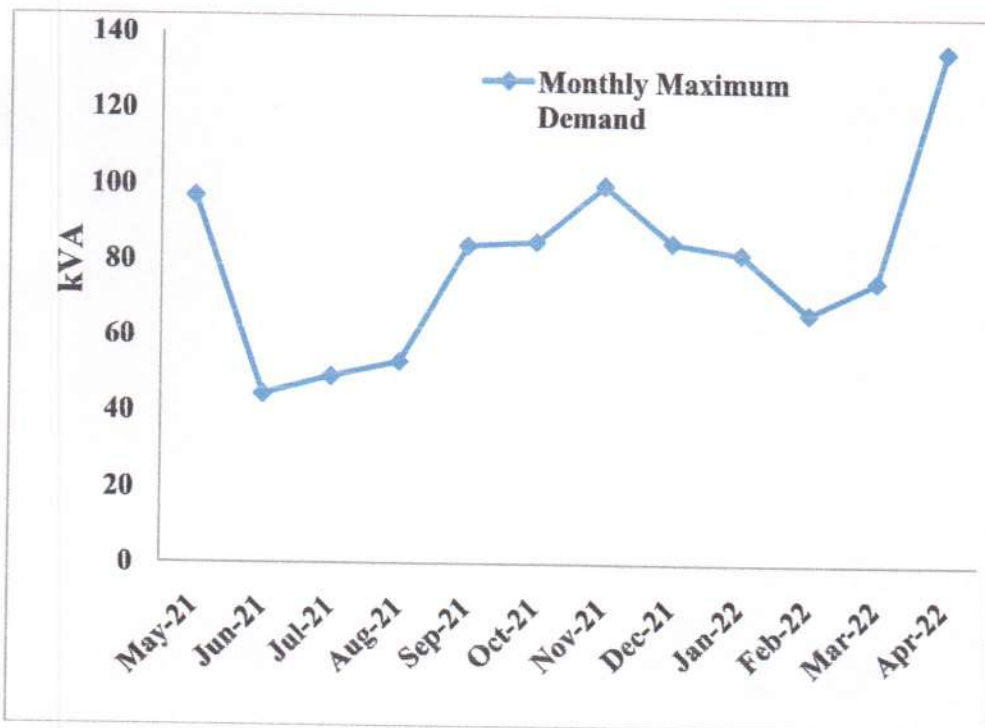
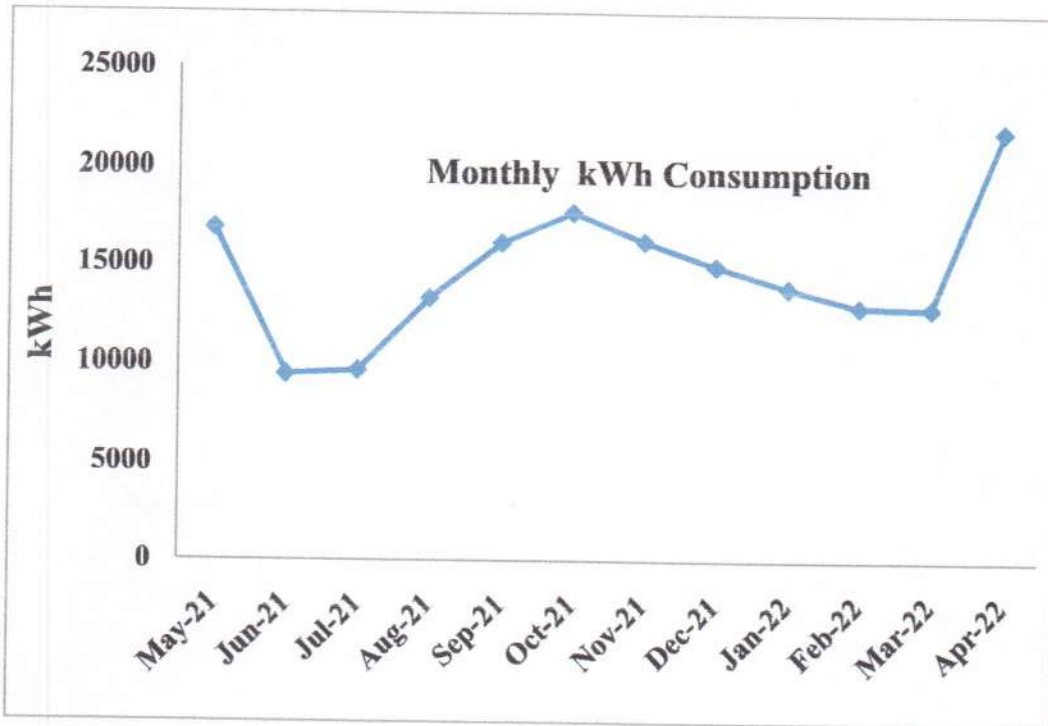
1.1. Electricity Bill Analysis


At present, one electricity meter is there for all campus

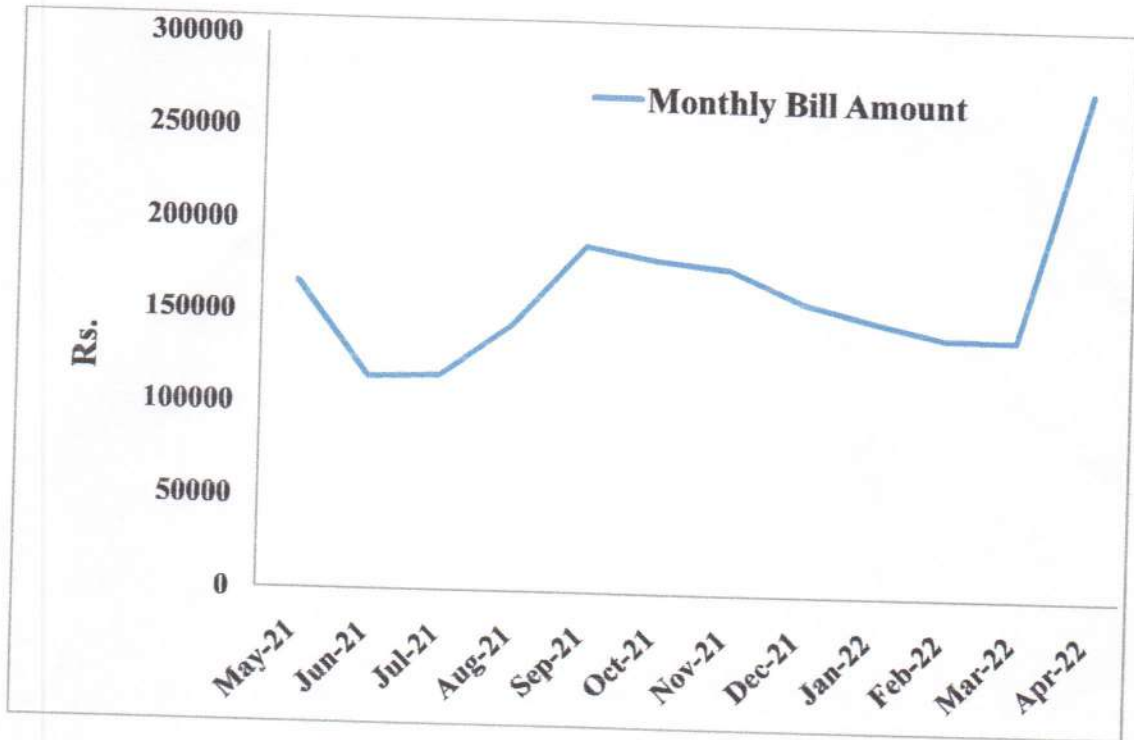
Bill analysis for consumer number KNL361 shown below

Month	KWh Unit	Bill Demand(KVA)	Max Demand(KVA)	Energy Charges(Rs.)	Demand Charges(Rs.)	P.F	Penalty (Rs)	Bill Amt	Unit/Rate (Rs.)
May-21	16814	100	96.86	128627.10	46008.50	1.00	0	165979	7.65
Jun-21	9421	100	44.30	72085.95	38000.00	1.00	0	114637	7.65
Jul-21	9615	100	49.00	73554.75	38000.00	1.00	0	115973	7.65
Aug-21	13256	100	53.00	101408.40	38000.00	1.00	0	144247	7.65
Sep-21	16095	100	84.00	123126.75	39900.00	1.00	0	187929	7.65
Oct-21	17641	100	85.00	134953.65	40375.00	1.00	0	180974	7.65
Nov-21	16184	100	100.00	123807.60	47500.00	1.00	0	176761	7.65
Dec-21	14924	100	84.92	11753.60	40375.00	1.00	0	159514	7.65
Jan-22	13824	100	81.96	105753.60	38931.00	1.00	0	149514	7.65
Feb-22	12883	100	66.22	98554.95	38000.00	1.00	0	140787	7.65
Mar-22	12813	100	74.80	98019.45	38000.00	1.00	0	140171	7.65
Apr-22	21882	100	135.4	167397.00	47500.00	1.00	21891	275534	7.65


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1.2.Observations


- Monthly average energy consumption is 14612 kWh
- Monthly average maximum demand is 79.62 kVA
- Monthly average power factor is 1.00
- Monthly average electricity bill is Rs. 162668/-
- Avg. unit rate is 7.65 Rs./kWh


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2. CONNECTED LOAD LIST

Ground Floor

S.NO	Room Name or Number	Type of load	Number	Capacity Watts	Volume (L×W×H)Meters	Load in kW	Daily operating hr	Monthly operating hr	Daily kWh	Monthly kWh
1	118 (UG Class Room)	Light	8	36	12.46×8.70×3.45	0.288	7	182	2.016	52.416
		Fan	6	70		0.42	7	182	2.94	76.44
2	119 (UG Class Room)	Light	8	36	12.46×8.70×3.45	0.288	7	182	2.016	52.416
		Fan	6	70		0.42	7	182	2.94	76.44
3	120 (Computer Room)	Light	4	36	8.29×8.70×3.45	0.144	7	182	1.008	26.208
		Fan	6	70		0.42	7	182	2.94	76.44
4	121 (Tutorial Room)	Light	2	36	4.1×8.70×3.45	0.072	7	182	0.504	13.104
		Fan	3	70		0.21	7	182	1.47	38.22
5	122 (Sports Room)	Light	2	36	4.1×5.9×3.45	0.072	7	182	0.504	13.104
		Fan	3	70		0.21	7	182	1.47	38.22
6	123 (UG Class Room)	Light	4	36	8.29×8.70×3.45	0.144	7	182	1.008	26.208
		Fan	6	70		0.42	7	182	2.94	76.44
7	124 (UG Class Room)	Light	8	36	12.46×8.70×3.45	0.288	7	182	2.016	52.416
		Fan	6	70		0.42	7	182	2.94	76.44
8	125 (Exam. Section)	Light	2	36	10.02×4.23×3.45	0.072	7	182	0.504	13.104
		Fan	4	70		0.28	7	182	1.96	50.96


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S.NO	Room Name or Number	Type of load	Number	Capacity Watts	Volume (L×W×H)Meters	Load in kW	Daily operating hr	Monthly operating hr	Daily kWh	Monthly kWh
9	101 (Principal Room)	Light	4	36	4.89×8.5×3.45	0.144	7	182	1.008	26.208
		Fan	2	70		0.14	7	182	0.98	25.48
		AC (1.5 T)	1	1800		1.8			12.6	327.6
10	102 (Office Room)	Light	3	36	4.89×5.95×3.45	0.108	7	182	0.756	19.656
		Fan	2	70		0.14	7	182	0.98	25.48
11	103 (Biochemistry Lab)	Light	7	36	8.37×8.70×3.45	0.252	7	182	1.764	45.864
		Fan	2	70		0.14	7	182	0.98	25.48
12	104 (Biotech & Microbiology Lab)	Light	2	36	8.29×8.70×3.45	0.072	7	182	0.504	13.104
		Fan	2	70		0.14	7	182	0.98	25.48
		AC (1.5 T)	1	1800		1.8			12.6	327.6
13	105 (House Kipping)	Light	2	36	4.1×5.9×3.45	0.072	7	182	0.504	13.104
		Fan	4	70		0.28	7	182	1.96	50.96
14	106 (Tutorial Room)	Light	2	36	4.1×8.7×3.45	0.072	7	182	0.504	13.104
		Fan	2	70		0.14	7	182	0.98	25.48
15	107 (Pharmacognacy Lab)	Light	9	36	8.37×8.70×3.45	0.324	7	182	2.268	58.968
		Fan	6	70		0.42	7	182	2.94	76.44
		AC (1.5 T)	1	1800		1.8			12.6	327.6
16	108 (Pharmaceutics Lab 1)	Light	9	36	10.45×8.70×3.45	0.324	7	182	2.268	58.968
		Fan	4	70		0.28	7	182	1.96	50.96
17	109 (Pharmaceutics Lab 2)	Light	9	36	10.45×8.70×3.45	0.324	7	182	2.268	58.968
		Fan	4	70		0.28	7	182	1.96	50.96


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S.NO	Room Name or Number	Type of load	Number	Capacity Watts	Volume (L×W×H)Meters	Load in kW	Daily operating hr	Monthly operating hr	Daily kWh	Monthly kWh
18	111 (Animal Room)	Light	8	36	7.87×8.19×3.45	0.288	7	182	2.016	52.416
		Fan	5	70		0.35	7	182	2.45	63.7
		AC (1.5 T)	1	1800		1.8	7	182	12.6	327.6
19	112 (Staff Room)	Light	3	36	7.87×4.27×3.45	0.108	7	182	0.756	19.656
		Fan	2	70		0.14	7	182	0.98	25.48
20	113 (Staff Room)	Light	3	36	7.87×4.27×3.45	0.108	7	182	0.756	19.656
		Fan	2	70		0.14	7	182	0.98	25.48
21	114 (Central Stores)	Light	2	36	7.87×4.27×3.45	0.072	7	182	0.504	13.104
		Fan	1	70		0.07	7	182	0.49	12.74
22	115 (Class Room)	Light	6	36	7.87×8.48×3.45	0.216	7	182	1.512	39.312
		Fan	4	70		0.28	7	182	1.96	50.96
		AC (1.5 T)	2	1800		3.6			25.2	655.2
23	116 (Womens Empowerment & Girls Waiting Room)	Light	8	36	7.87×8.19×3.45	0.288	7	182	2.016	52.416
		Fan	6	70		0.42	7	182	2.94	76.44
I	Corridor	Light	35	36		1.26	7	182	8.82	229.32
		Refrigerator	7	100		0.7	7	182	4.9	127.4

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First Floor

S.NO	Room Name or Number	Type of load	Number	Capacity Watts	Volume (L×W×H)Meters	Load in kW	Daily operating hr	Monthly operating hr	Daily kWh	Monthly kWh
1	215 (UG Class Room)	Light	5	36	8.35×8.70×3.45	0.18	7	182	1.26	32.76
		Fan	4	70		0.28	7	182	1.96	50.96
2	216 (UG Class Room)	Light	3	36	8.35×8.70×3.45	0.108	7	182	0.756	19.656
		Fan	2	70		0.14	7	182	0.98	25.48
3	217 (Library)	Light	9	36	20.92×8.70×3.45	0.324	7	182	2.268	58.968
		Fan	8	70		0.56	7	182	3.92	101.92
4	218 (Seminar Hall)	Light	64	18	20.92×8.70×3.45	1.152	7	182	8.064	209.664
		Fan	8	70		0.56	7	182	3.92	101.92
		AC (1.5 T)	4	1800		7.2			50.4	1310.4
5	219 (Ladies Waiting Room)	Light	2	36	4.10×8.50×3.45	0.072	7	182	0.504	13.104
		Fan	2	70		0.14	7	182	0.98	25.48
6	220 (HOD/Staff Room)	Light	2	36	5.90×5.95×3.45	0.072	7	182	0.504	13.104
		Fan	3	70		0.21	7	182	1.47	38.22
		AC (1.5 T)	2	1800		3.6			25.2	655.2
7	201 (Cen .Inst. Room)	Light	3	36	10.10×9.1×3.45	0.108	7	182	0.756	19.656
		Fan	2	70		0.14	7	182	0.98	25.48
8	202 (HOD/Staff Room)	Light	3	36	5.90×5.95×3.45	0.108	7	182	0.756	19.656
		Fan	2	70		0.14	7	182	0.98	25.48
9	203 (Gents Waiting Room)	Light	4	36	4.00×8.50×3.45	0.144	7	182	1.008	26.208
		Fan	5	70		0.35	7	182	2.45	63.7

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S.NO	Room Name or Number	Type of load	Number	Capacity Watts	Volume (L×W×H)Meters	Load in kW	Daily operating hr	Monthly operating hr	Daily kWh	Monthly kWh
10	204 (Pharmacology Lab)	Light	2	36	8.37×8.90×3.45	0.072	7	182	0.504	13.104
		Fan	4	70		0.28				
11	205 (Anotomy Lab)	Light	2	36	8.37×8.90×3.45	0.072	7	182	0.504	13.104
		Fan	1	70		0.07				
12	206 (Tutorial Room)	Light	2	36	4.10×8.70×3.45	0.072	7	182	0.504	13.104
		Fan	4	70		0.28				
13	207 (Pharma Analysis Lab)	Light	3	36	8.37×8.70×3.45	0.108	7	182	0.756	19.656
		Fan	2	70		0.14				
14	208 (Tutorial Room)	Light	4	36	4.10×8.70×3.45	0.144	7	182	1.008	26.208
		Fan	4	70		0.280				
15	209 (Pharma chemistry Lab 1)	Light	2	36	8.37×8.90×3.45	0.072	7	182	0.504	13.104
		Fan	5	70		0.35				
16	210 (Pharma chemistry Lab 2)	Light	2	36	8.37×8.90×3.45	0.072	7	182	0.504	13.104
		Fan	4	70		0.28				
17	212 (Class Room)	Light	3	36	7.87×8.48×3.45	0.108	7	182	0.756	19.656
		Fan	6	70		0.42				
18	213 (Class Room)	Light	3	36	7.87×12.85×3.45	0.108	7	182	0.756	19.656
		Fan	6	70		0.42				
II	Corridor	Light	28	36		1.008	7	182	7.056	183.456
		Refrigerator	8	100		0.8				


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Lab Equipments

S No	Name of The Instrument	Quantity	Capacity in (W)	Load in (kW)	Daily operating hr	Monthly operating hr	Daily kWh	Monthly kWh
1	ROTA EVAPORATOR	3	690	2.07	2	52	4.14	107.64
2	COOLING CENTRIFUGE	1	230	0.23	1	26	0.23	5.98
3	STABILIZER FOR VACCUM FILTRATION	1	230	0.23	2	52	0.46	11.96
4	DIGITAL POTENTIOMETER	2	440	0.88	1	26	0.88	22.88
5	FLAME PHOTOMETER	2	400	0.8	2	52	1.6	41.6
6	GEL ELECTROPHORESIS	2	420	0.84	2	52	1.68	43.68
7	SONICATOR	3	720	2.16	1	26	2.16	56.16
8	HPLC	2	600	1.2	3	78	3.6	93.6
9	DIGITAL PH METER	2	400	0.8	1	26	0.8	20.8
10	UV VISIBLE SPECTROSCOPY	3	720	2.16	2	52	4.32	112.32
11	PHOTO FLOURI METER	2	460	0.92	1	26	0.92	23.92
12	VERTEX SHAKER	1	220	0.22	2	52	0.44	11.44
13	CONDUCTIVITY METER	2	480	0.96	1	26	0.96	24.96
14	DIGITAL BALANCE	7	1260	8.82	2	52	17.64	458.64
15	DISSOLUTION TEST APP	1	230	0.23	2	52	0.46	11.96

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16	DIS INTEGRATION TEST APP	2	440	0.88	1	26	0.88	22.88
17	HOT AIR OVEN	6	1380	8.28	3	78	24.84	645.84
18	TAP DENSITY APP	1	230	0.23	1	26	0.23	5.98
19	FRIABILITY TEST APP	1	230	0.23	2	52	0.46	11.96
20	NUNES VISCOMETER	1	240	0.24	1	26	0.24	6.24
21	MERILIZER	1	240	0.24	2	52	0.48	12.48
22	UV CABINET	3	660	1.98	1	26	1.98	51.48
23	MELTING POINT APP	4	800	3.2	2	52	6.4	166.4
24	VACCUM PUMP	1	210	0.21	2	52	0.42	10.92
25	HEATING MANTLES	20	4400	88	1	26	88	2288
26	CENTRIFUGE	2	480	0.96	3	78	2.88	74.88
27	PHOT ELECTRIC COLORI METER	1	200	0.2	1	26	0.2	5.2
28	MICROWAVE OVEN	2	220	0.44	2	52	0.88	22.88
29	MAGENTIC STIRRER	18	3600	64.8	1	26	64.8	1684.8
30	WATER BATH	5	1150	5.75	2	52	11.5	299
31	KF TITRATOR	1	210	0.21	1	26	0.21	5.46
32	POLAROGRAPHY METER	1	220	0.22	2	52	0.44	11.44
33	DIGITAL NEPHLO TURBIDITY METER	1	240	0.24	2	52	0.48	12.48
34	UV TRANS ILLUMINATOR	1	230	0.23	1	26	0.23	5.98
35	POLE CLIMB APPARATUS	1	220	0.22	3	78	0.66	17.16


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36	TISSUE HOMOGENIZER	1	210	0.21	1	26	0.21	5.46
37	ELECTRO CONVULSO METER	1	230	0.23	2	52	0.46	11.96
38	ROTA ROD APPARATUS		220	0	1	26	0	0
39	MICRO CENTRIFUGE	2	460	0.92	2	52	1.84	47.84
40	PROJECTION MICROSCOPE	1	20	0.02	1	26	0.02	0.52
41	PHYSIOGRAPH CHANNEL	1	220	0.22	2	52	0.44	11.44
42	ROTATING DRUM	1	220	0.22	2	52	0.44	11.44
43	ANALGESIOMETER	1	200	0.2	1	26	0.2	5.2
44	ACTOPHOTOMETER	1	180	0.18	3	78	0.54	14.04
45	STABILITY CHAMBER	1	230	0.23	1	26	0.23	5.98
46	VACCUUM OVEN	1	240	0.24	2	52	0.48	12.48
47	ALL PURPOSE EQUIPMENT	1	220	0.22	1	26	0.22	5.72
48	BOTTLE WASHING MACHINE	1	200	0.2	2	52	0.4	10.4
49	TABLET PUNCHING MACHINE	1	415	0.415	1	26	0.415	10.79
50	TRAY DRYER	1	415	0.415	2	52	0.83	21.58
51	SIEVE SHAKER	1	220	0.22	2	52	0.44	11.44
52	RIBBON BLENDER	1	415	0.415	1	26	0.415	10.79
53	GRANULATOR	1	415	0.415	3	78	1.245	32.37

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54	LAMINAR AIR FLOW	1	240	0.24	1	26	0.24	6.24
55	HOMOGENIZER	1	230	0.23	2	52	0.46	11.96
56	HOT PLATE	1	220	0.22	1	26	0.22	5.72
57	SINGLE BASKET DISSOLUTION	1	220	0.22	2	52	0.44	11.44
58	V CONE BLENDER	1	230	0.23	1	26	0.23	5.98
59	DISTILLATION UNIT	1	240	0.24	2	52	0.48	12.48
60	COOLING INCUBATOR	1	240	0.24	2	52	0.48	12.48
61	BOD INCUBATOR	2	460	0.92	1	26	0.92	23.92
62	ANTIBIOTIC ZONE READER	1	230	0.23	3	78	0.69	17.94
63	AUTO CLAVE	2	440	0.88	1	26	0.88	22.88
64	BINOCULAR MICROSCOPE	2	460	0.92	1	26	0.92	23.92
65	MUFFLE FURNACE	1	240	0.24	4	104	0.96	24.96
66	COMPUTERS (GROUND FLOOR)	68	175	11.9	4	104	47.6	1237.6
67	COMPUTERS (FIRST FLOOR)	15	175	2.625	6	156	15.75	409.5


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3. ENERGY SAVING MEASURE

3.1. Energy Saving Measure 1 – Replacement of conventional lighting system into LED

Ground Floor

S.NO	Room Name or Number	Number	Capacity Watts	Load in kW	Monthly hr	Monthly kWh	Change	New Capacity W	Load in kW	Monthly kWh	Saving kWh	Saving (Rs.)	Unit cost (Rs.)	Total Inv (Rs)	Payback Period in months
1	118	8	36	0.288	182	52.416	18W Led Tube light	18	0.144	26.208	26.208	200	300	2400	12
2	119	8	36	0.288	182	52.416		18	0.144	26.208	26.208	200	300	2400	12
3	120	4	36	0.144	182	26.208		18	0.072	13.104	13.104	100	300	1200	12
4	121	2	36	0.072	182	13.104		18	0.036	6.552	6.552	50	300	600	12
5	122	2	36	0.072	182	13.104		18	0.036	6.552	6.552	50	300	600	12
6	123	4	36	0.144	182	26.208		18	0.072	13.104	13.104	100	300	1200	12
7	124	8	36	0.288	182	52.416		18	0.144	26.208	26.208	200	300	2400	12
8	125	2	36	0.072	182	13.104		18	0.036	6.552	6.552	50	300	600	12
9	101	4	36	0.144	182	26.208		18	0.072	13.104	13.104	100	300	1200	12
10	102	3	36	0.108	182	19.656		18	0.054	9.828	9.828	75	300	900	12
11	103	7	36	0.252	182	45.864		18	0.126	22.932	22.932	175	300	2100	12
12	104	2	36	0.072	182	13.104		18	0.036	6.552	6.552	50	300	600	12
13	105	2	36	0.072	182	13.104		18	0.036	6.552	6.552	50	300	600	12
14	106	2	36	0.072	182	13.104		18	0.036	6.552	6.552	50	300	600	12
15	107	9	36	0.324	182	58.968		18	0.162	29.484	29.484	226	300	2700	12
16	108	9	36	0.324	182	58.968		18	0.162	29.484	29.484	226	300	2700	12
17	109	9	36	0.324	182	58.968		18	0.162	29.484	29.484	226	300	2700	12
18	111	8	36	0.288	182	52.416		18	0.144	26.208	26.208	200	300	2400	12
19	112	3	36	0.108	182	19.656		18	0.054	9.828	9.828	75	300	900	12
20	113	3	36	0.108	182	19.656		18	0.054	9.828	9.828	75	300	900	12

21	114	2	36	0.072	182	13.104		18	0.036	6.552	6.552	50	300	600	12
22	115	6	36	0.216	182	39.312		18	0.108	19.656	19.656	150	300	1800	12
23	116	8	36	0.288	182	52.416		18	0.144	26.208	26.208	200	300	2400	12
24	Corridor	35	36	1.260	182	229.32		18	0.63	114.66	114.66	877	300	10500	12

First Floor


S.NO	Room Name or Number	Number	Capacity Watts	Load in kW	Monthly hr	Monthly kWh	Change	New Capacity W	Load in kW	Monthly kWh	Saving kWh	Saving (Rs.)	Unit cost (Rs.)	Total Inv (Rs)	Payback Period in months
1	215	5	36	0.18	182	32.760	18W Led Tube light	18	0.09	16.38	16.38	125	300	1500	12
2	216	3	36	0.108	182	19.656		18	0.054	9.83	9.83	75	300	900	12
3	217	9	36	0.324	182	58.968		18	0.162	29.48	29.48	226	300	2700	12
4	218	64	18	1.152	182	209.66		18	1.152	209.7	0.00	0	0	0	0
5	219	2	36	0.072	182	13.104		18	0.036	6.55	6.55	50	300	600	12
6	220	2	36	0.072	182	13.104		18	0.036	6.55	6.55	50	300	600	12
7	201	3	36	0.108	182	19.656		18	0.054	9.83	9.83	75	300	900	12
8	202	3	36	0.108	182	19.656		18	0.054	9.83	9.83	75	300	900	12
9	203	4	36	0.144	182	26.208		18	0.072	13.10	13.10	100	300	1200	12
10	204	2	36	0.072	182	13.104		18	0.036	6.55	6.55	50	300	600	12
11	205	2	36	0.072	182	13.104		18	0.036	6.55	6.55	50	300	600	12
12	206	2	36	0.072	182	13.104		18	0.036	6.55	6.55	50	300	600	12
13	207	3	36	0.108	182	19.656		18	0.036	6.55	6.55	50	300	600	12
14	208	4	36	0.144	182	26.208		18	0.054	9.83	9.83	75	300	900	12
15	209	2	36	0.072	182	13.104		18	0.072	13.10	13.10	100	300	1200	12
16	210	2	36	0.072	182	13.104		18	0.036	6.55	6.55	50	300	600	12
17	212	3	36	0.108	182	19.656		18	0.036	6.55	6.55	50	300	600	12
18	213	3	36	0.108	182	19.656		18	0.054	9.83	9.83	75	300	900	12
19	Corridor	28	36	1.008	182	183.46		18	0.504	91.73	91.73	702	300	8400	12

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Lighting Recommendation -1

Replace the existing 36 W FTL tube lights into 18 W LED tubes

- Total No. of light fittings = 296 Nos.
- Total No. of light fittings to be replace= 232 Nos.
- Present Energy Consumption = 1730 kWh
- Expected Energy Consumption = 970 kWh
- Total Energy Saved per Month = $1730-970= 760$ kWh
- Total Saving = 760 kWh
- Monetary Savings = Rs.5814
- Investment = Rs.69600
- Simple Payback period = 12 Months


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3.2. Energy Saving Measure 2 – Replacement of conventional ceiling fans with energy efficient ceiling fans

Ground Floor

S. N O	Room Name or Number	Number	Capacity Watts	Load in kW	Monthly hr	Monthly kWh	Change	New Capacity(W)	Load in kW	Monthly kWh	Saving kWh	Saving (Rs.)	Unit cost (Rs.)	Total Inv (Rs)	Payback Period in months
1	118	6	70	0.42	182	76.44	40W Fans	40	0.24	43.68	32.76	251	1000	6000	24
2	119	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	1000	6000	24
3	120	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	1000	6000	24
4	121	3	70	0.21	182	38.22		40	0.12	21.84	16.38	125	1000	3000	24
5	122	3	70	0.21	182	38.22		40	0.12	21.84	16.38	125	1000	3000	24
6	123	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	1000	6000	24
7	124	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	1000	6000	24
8	125	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	1000	4000	24
9	101	2	70	0.14	182	25.48		40	0.08	14.56	10.92	84	1000	2000	24
10	102	2	70	0.14	182	25.48		40	0.08	14.56	10.92	84	1000	2000	24
11	103	2	70	0.14	182	25.48		40	0.08	14.56	10.92	84	1000	2000	24
12	104	2	70	0.14	182	25.48		40	0.08	14.56	10.92	84	1000	2000	24
13	105	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	1000	4000	24
14	106	2	70	0.14	182	25.48		40	0.08	14.56	10.92	84	1000	2000	24
15	107	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	1000	6000	24
16	108	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	1000	4000	24
17	109	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	1000	4000	24
18	111	5	70	0.35	182	63.7		40	0.2	36.4	27.3	209	1000	5000	24
19	112	2	70	0.14	182	25.48		40	0.08	14.56	10.92	84	1000	2000	24
20	113	2	70	0.14	182	25.48		40	0.08	14.56	10.92	84	1000	2000	24
21	114	1	70	0.07	182	12.74		40	0.04	7.28	5.46	42	1000	1000	24
22	115	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	1000	4000	24
23	116	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	1000	6000	24

First Floor


S. N O	Room Name or Number	Number	Capacity Watts	Load in kW	Monthly hr	Monthly kWh	Change	New Capacity W	Load in kW	Monthly kWh	Saving kWh	Saving (Rs.)	Unit cost (Rs.)	Total Inv (Rs)	Payback Period in months
1	215	4	70	0.28	182	50.96	40W Fans	40	0.16	29.12	21.84	167	1000	4000	24
2	216	2	70	0.14	182	25.48		40	0.08	14.56	10.92	84	1000	2000	24
3	217	8	70	0.56	182	101.92		40	0.32	58.24	43.68	334	1000	8000	24
4	218	8	70	0.56	182	101.92		40	0.32	58.24	43.68	334	1000	8000	0
5	219	2	70	0.14	182	25.48		40	0.08	14.56	10.92	84	1000	2000	24
6	220	3	70	0.21	182	38.22		40	0.12	21.84	16.38	125	1000	3000	24
7	201	2	70	0.14	182	25.48		40	0.08	14.56	10.92	84	1000	2000	24
8	202	2	70	0.14	182	25.48		40	0.08	14.56	10.92	84	1000	2000	24
9	203	5	70	0.35	182	63.7		40	0.2	36.40	27.30	209	1000	5000	24
10	204	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	1000	4000	24
11	205	1	70	0.07	182	12.74		40	0.04	7.28	5.46	42	1000	1000	24
12	206	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	1000	4000	24
13	207	2	70	0.14	182	25.48		40	0.08	14.56	10.92	84	1000	2000	24
14	208	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	1000	4000	24
15	209	5	70	0.35	182	63.7		40	0.2	36.40	27.30	209	1000	5000	24
16	210	4	70	0.28	182	50.96		40	0.16	29.12	21.84	167	1000	4000	24
17	212	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	1000	6000	24
18	213	6	70	0.42	182	76.44		40	0.24	43.68	32.76	251	1000	6000	24


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Fan Recommendation -2

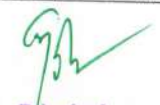
Replace existing 70 watt conventional ceiling fans with 40 watt energy efficient fans

- Total No. of ceiling fans present = 160 Nos.
- Total No. of ceiling fans presently operated= 160 Nos.
- Total No. of ceiling fans to be replace= 160 Nos.
- Present Energy Consumption = 2039 kWh
- Expected Energy Consumption = 1165 kWh
- Total Energy Saved per Month = $2039 - 1165 = 874$ kWh
- Total Saving = 874 kWh
- Monetary Savings = Rs.6686/-
- Investment = Rs. 160000/-
- Simple Payback period = 24 Months


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3.3. Energy Saving Measure 3 – Replacement of conventional AC system into 5 Star Inverter AC


S. No	Room Name or Number	Number	Capacity Watts	Load in kW	Monthly hr	Monthly kWh	Change	New Capacity W	Load in kW	Monthly kWh	Saving kWh	Saving (Rs.)	Unit cost (Rs.)	Total Inv (Rs)	Payback Period in months
1	101 Principal	1	1800	1.8	182	327.6	5 Star Inverter AC 890 W	890	0.89	161.98	165.62	1267	45000	45000	36
2	104 (Biotech & Microbiology Lab)	1	1800	1.8	182	327.6		890	0.89	161.98	165.62	1267	45000	45000	36
3	107 (Pharma Lab)	1	1800	1.8	182	327.6		890	0.89	161.98	165.62	1267	45000	45000	36
4	111 (Animal Room)	1	1800	1.8	182	327.6		890	0.89	161.98	165.62	1267	45000	45000	36
5	115	2	1800	3.6	182	655.2		890	1.78	323.96	331.24	2534	45000	90000	36
6	218 (Seminar hall)	4	1800	7.2	182	1310.4		890	3.56	647.92	662.48	5068	45000	180000	36
7	220	2	1800	3.6	182	655.2		890	1.78	323.96	331.24	2534	45000	90000	36


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AC Recommendation -3

Replace existing 1800 watt conventional AC with 890 watt energy efficient AC

- Total No. of AC present = 12 Nos.
- Total No. of AC presently operated= 12 Nos.
- Total No. of AC to be replace= 12 Nos.
- Present Energy Consumption = 3932 kWh
- Expected Energy Consumption = 1944 kWh
- Total Energy Saved per Month = $3931 - 1944 = 1987$ kWh
- Total Saving = 1987 kWh
- Monetary Savings = Rs.15200/-
- Investment = Rs. 540000/-
- Simple Payback period = 36 Months


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4. REQUIREMENTS OF "NAAC"

4.1. Alternative Energy Initiative

Percentage of power requirement met by renewable energy sources

$$= (\text{Power requirement met by renewable energy sources} / \text{Total energy requirement}) \times 100$$

$$= (380/14612) \times 100$$

$$= 2.60 \%$$

4.2. Percentage of lighting power requirement met through LED bulbs


Percentage of lighting power requirement met through LED bulbs

$$= (\text{Lighting power requirement met through LED bulbs} / \text{Total lighting power requirement}) \times$$

100

$$= (1.152 / 9.504)$$

$$= 12.12 \%$$


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