AMITY UNIVERSITY
MADHYA PRADESH

ENERGY AUDIT REPORT (2023-24)

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for Amity University

Registrar
Amity University Madhya Pradesh
Gwalior

Acknowledgement

Energy Audit Assessment Team thanks the Hon'ble Pro Chancellor Amity University Madhya Pradesh for assigning this important work of Energy Audit. We appreciate the cooperation extended to our team during the entire process.

Our special thanks are due to:

- Vice Chancellor, AUMP
- Pro Vice Chancellor AUMP
- Registrar AUMP
- Director Administration, AUMP

For giving us necessary guidance and inputs to carry out this very important exercise of Energy Audit.

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Preface

Energy has been identified as a crucial and balancing factor in the indices for sustainable development since the Earth Summit in 1992. Especially in the contemporary scenario, it is acknowledged that the heavy and unbalanced energy consumption adversely affects energy price and economic growth, and most countries now give priority to energy conservation methods. The Energy Conservation Act, 2001, defines Energy Auditing as the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption.

It facilitates a systematic approach to the energy management in a system, trying to balance the total energy input with its use. It identifies all the energy streams in a system and quantifies the use of energy according to its discrete functions. It is a study to determine how and where energy is used, and to identify methods for energy savings. The Energy Auditing for a day is the index of the consumption which normalizes the situation of Energy crisis by providing the schemes for conservation of energy. The opportunities lie in the use of existing renewable energy technologies, greater efforts at energy efficiency and the dissemination of latest technologies

The energy audit of AUMP was carried out by the members of the Department of Environment on behalf of IQAC, under the supervision of the Energy Audit team. This report is our mite in contributing to the larger picture of effective energy management and conservation. As is known, energy auditing is an on-going process, a part of a larger procedure to ensure long-term sustainable development. We have enlisted plausible solutions based on the outcome of our analysis of data, and our recommendations, which can be implemented wholeheartedly in the campus in order to ensure minimizing energy waste and maximizing energy potential. We hope in all earnest that these will be given its due and that the audit will be fruitful in terms of energy conservation.

Introduction

Amity University Madhya Pradesh was established in 2010. It is now a leading institute offering higher education in the state of Madhya Pradesh. The significant advances the University made in academic and research activities were matched with parallel improvements in the technical and infrastructure facilities of the campus, which makes it retain its position of excellence across time.

It has 10 institutes housed in 3 blocks of buildings spread across 110 acres. The vast campus and the large number of rooms being in use as classrooms and other facilities necessitated the implementation of a separate transformer for the college. The amount of the electricity bill was climbing steadily across the years.

The expansive network of cables was found to conflict with the growing branches of trees, and thus the entire electric cables were laid in underground ducts, which was in sync with environment protection also. This audit was undertaken in order to verify how effective these steps were, and also to identify loopholes, if any, in the existing practices, along with outlining measures for enhancing energy utilization.

About the University

Amity University Madhya Pradesh was established by Ritnand Balved Education Foundation (RBEF) vide Madhya Pradesh Government Legislature Act of 2010 with the view to promote professional, industry-oriented education in the state of Madhya Pradesh. Amity University Madhya Pradesh, Gwalior located on a sprawling campus of 102 acres of land opposite Gwalior Airport, imparts modern, practical and research-oriented courses which will lead to the development of professionals who are employable and industry ready. This in turn will drive the socio-economic upliftment of the region. Amity imparts education in almost all areas including management, engineering, architecture, biotechnology, law, communication, behavioral science, fine arts, fashion etc.

Amity University Madhya Pradesh has been honored with the title of "Institution of Happiness - 2024" by QS I-Gauge. As per QS Southern Asia ranking, Amity University Madhya Pradesh is ranked 278 under Southern Asia category and in Asia it comes under 851-900 Band. AUMP has been ranked No. 1 in Private University in Madhya Pradesh. Ranked between 201 – 300 Band in the Engineering category by National Institutional Ranking Framework (NIRF) India Ranking 2024. In the year 2023-24 AUMP Ranked 3rd in West Zone, under the category of Multidisciplinary Emerging University. Amity University Madhya Pradesh bestowed with award of “Excellence in Placement Award 2024” by ZEE MP & CG Education Excellence Conclave on 1st June 2024. Amity University has been ranked in between 1001 – 1500 Band overall and as per Quality Education it is ranked between 601-800 Band, as per Decent Work and Economic growth it is ranked between 610-800 Band, as per Gender Equality it is ranked in 1000+ Band and as per partnership for the goals the University is ranked in 301-400 Band.

The University has one N.S.S. units sanctioned by the university, which are doing tremendous job through organizing activities like blood donations, tree plantations, health check-up, personality development etc. are conducted by this unit.

Objectives

The Energy Audit Manual of the Energy Management Centre, Government of Madhya Pradesh, defines the primary objective of any energy audit as determining "ways to reduce energy consumption per unit of product output or to lower operating costs" (www.Madhya Pradeshenergy.gov.in). The recommendations of the study will become a basis for future schemes of better energy consumption and preservation throughout the organization.

Specific objectives of the study are:

- Verify the steps adopted for energy management in the campus
- Spot the inefficient or inadequate practices, if any
- Improve the energy preserving measures and methods
- Identify potential energy saving opportunities
- Formulate feasible steps and measures to be adopted in the campus

Methodology

Energy audits are primarily classified into

- Preliminary Audit
- Detailed Audit

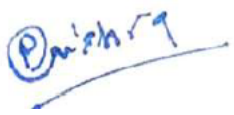
A Preliminary Audit uses existing data to look extensively at the existing energy consumption patterns and identifies the areas for improvement, sets “reference points”, and identifies areas for more in-depth study.

A Detailed Audit is more comprehensive and is carried out in phases, evaluating all major energy using systems. It estimates energy savings and cost, and accounts for the energy use of all major equipments.

Since the Detailed Audit is meant for industry, and because of the limited size and the amount of energy consumption of the institution, the Preliminary Audit method was chosen for this year.

Energy audit team

S.No	Name	Designation
1.	Prof. (Dr.) Pankaj Mishra, Chairman	Professor, Department of Physics, Amity School of Engineering and Technology (ASET)
2.	Prof. (Dr.) Kuldip Dwivedi, Member	Head, Department of Environmental Science
3.	Dr. Rwitabrata Mallick, Member	Associate Professor, Department of Environmental Science
4.	Mr. Jitendra Singh Member	Manager (Electrical), AUMP
5.	Mr. Umesh Kumar Sharma Secretary	Deputy Director Maintenance, AUMP



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Head, Department of Environmental Science

Dr. Rwitabrata Mallick

Associate Professor, Department of Environmental Science

Mr. Jitendra Singh

Manager (Electrical), AUMP

Mr. Umesh Kumar Sharma

Deputy Director Maintenance, AUMP

Data collection

For the purpose of this audit, audit groups for specific areas were formed. Data was collected through

- Visual inspection and observation
- Verification/ Identification of energy consumption
- Detailed calculations, analysis
- Validation

Division of work

- 2 teams of 5 members were formed and one faculty from the Energy Audit team was put in charge of the teams.

- Team 1 was put in charge of "Lighting" and team 2 oversaw "Electrical equipment".

- They would gather the data under the guidance of the Energy Audit Team.

Data analysis

The gathered data was then quantified and segregated according to the following criteria:

1. Energy consumption by end use
2. Average energy use block-wise
3. Consumption equipment-wise
4. Rate of consumption month-wise
5. Rate of consumption timewise

Major findings

A.

- The laboratories record the highest consumption based on end use
- Laboratory equipment show the highest rate of consumption equipment-wise
- The months of May and June shows the peak in consumption
- The time slots in the Afternoon record the highest consumption on a normal working day.

B.

- Old wiring cables in many parts of the campus leading to loss of energy
- Old water pipelines in several parts of the campus leading to waste of energy
- Use of incandescent bulbs in certain rooms
- Electric supply still depending on State Electricity Board, instead of solar panels
- Use of old equipment such as refrigerators in laboratories
- Uneven lighting facility – certain classrooms are under-illuminated, certain classes have more lights than required

C.

- updating of technologies in laboratory equipment
- replacing old electrical cables and pipelines
- replacing incandescent bulbs with LEDs

- ensuring even lighting facilities in rooms
- use of Solar panels as a main source of lighting, especially common areas and grounds replacing old gadgets in laboratories

D.

- Replacing incandescent bulbs with LEDs
- Repairing and updating laboratory equipment
- Encouraging students and staff to switch off electrical gadgets and turn off the water taps when not in use

E.

- 1. Planning the electrical wiring more efficiently, doing away with unused power points and redundant electrical gadgets
- 2. Installing solar panels in possible buildings/ blocks

Recommendations

- Most of the power consumption is used for lighting, electric fans, computers and pumps.
- The heritage structure of buildings, with most of the rooms blessed with natural light and ventilation helps in reducing the number of lighting and ventilating equipment and gadgets.
- New buildings to be constructed should follow the pattern and assure natural light and air passage, to reduce loss of energy
- The electrical wiring of many buildings was found to be old and inefficient Replace old electrical cables with new ones Poor plumbing lines leads to loss of water and subsequent loss of power resulting from over Replace old pipelines with new ones, and latest motors for pumping water. pumping.
- There are several unused sockets and redundant power points causing power wastage.
- The number of sockets should be verified and ensured that only the good ones are being used. There seem to be a lack of judicious use of power among students and staff. During the study, it was found that lights, fans and computers were kept on working mode in many rooms, without a single person present. Students and staff should be exhorted constantly to use energy judiciously.
- Posters and pamphlets should be distributed and notices about saving energy should be posted at major points of use.

- Uneven distribution of lighting facilities. Certain classrooms were under-illuminated, while certain classrooms there seem to be more lights than necessary.
- Even lighting distribution system should be ensured.
- Many Dept. still use incandescent bulbs causing heavy power loss Incandescent bulbs should be replaced with LEDs; the entire power requirement is met from the MPEB line.
- More solar panels should be installed in key areas of the campus and loads for common areas and grounds should be met from these.
- AC, refrigerators and freezers used in many departments use obsolete technology and hence cause power loss.
- Gadgets and equipment should be repaired and/or replaced with latest ones to save energy.
- Surprisingly, it was found that power consumption is high in many locked buildings at night. This is probably due to locking the rooms without switching off gadgets. Proper switching off of the gadgets and equipment should be ensured strictly.

Conclusion

- A well-prepared electrical wiring plan for the campus, which would help identify unused points of power and in re-wiring the buildings
- Electric fans should be serviced and bearings replaced wherever necessary
- The scope for non-conventional energy should be utilized.
- Installation of a suitable Bio-gas plant to save energy used for heating water in Science laboratories.
- Rigorous training for both students and staff to inculcate awareness for the need of energy conservation. If everyone ensures switching off lights, fans and electrical gadgets that are not in use, roughly 10% to15% of energy saving is possible
- A master switch located at a prominent place which can be directly supervised by the HoD/supervising staff would help avoid power wastage in closed rooms.
- A healthy competition may be encouraged between departments by honouring those departments that produce higher savings by good practices. An element of weight-based on the above lines may be considered for allocation of funds.
- It is suggested that a permanent body under the chairmanship of a senior teacher may be established in the University campus for periodical review of energy usage and concurrent energy audit.

Annexure 1

Unit Cost of Energy

Month v	Unit cost of energy from MPEB Rs/KWh		Cost of generation by DG sets Rs/KWh	
1	2		3	
Year >	**2023**	**2024**	**2023**	**2024**
Jan	16.12	14.43	30.39	31.20
Feb	17.44	15.26	30.19	31.44
Mar	13.40	12.87	30.51	31.51
Apr	10.08	11.19	33.85	31.66
May	10.07	10.84	32.33	31.61
Jun	9.76	10.68	31.10	31.60
Jul	11.66	13.51	31.47	31.56
Aug	12.21	12.40	31.33	31.56
Sep	10.49	11.58	31.65	31.53
Oct	10.96	11.27	31.35	31.58
Nov	12.46	12.88	31.57	31.63
Dec	13.63	15.78	31.39	31.72
Avg	**11.34**	**12.18**	**31.65**	**31.56**

Month v	Total cost per unit Rs/KWh (w/o maintenance)		Total cost per unit Rs/KWh (with maintenance)		Difference between (5 - 4)		Rate of diesel Rs/Ltr	
1	4		5		6		7	
Year >	**2023**	**2024**	**2023**	**2024**	**2023**	**2024**	**2023**	**2024**
Jan	17.28	16.39	18.08	16.39	0.80	0.00	90.69	93.80
Feb	18.14	16.63	18.14	17.01	0.00	0.38	90.69	93.80
Mar	14.59	14.44	14.82	14.44	0.22	0.00	91.45	93.72
Apr	11.20	12.28	11.20	12.28	0.00	0.00	100.98	93.80
May	12.02	12.70	12.02	12.70	0.00	0.00	97.64	93.80
Jun	10.87	12.44	10.93	12.57	0.06	0.13	93.72	93.80
Jul	13.35	14.84	13.35	14.84	0.00	0.00	93.72	93.80
Aug	14.05	14.23	14.05	14.23	0.00	0.00	93.76	93.80
Sep	11.83	13.70	11.83	13.70	0.00	0.00	93.76	93.80
Oct	12.09	12.79	12.09	12.79	0.00	0.00	93.76	93.80
Nov	13.51	13.87	15.34	13.87	1.83	0.00	93.76	93.80
Dec	14.52	17.48	14.52	19.72	0.00	2.24	93.76	93.80
Avg	**12.70**	**13.83**	**12.86**	**13.97**	**0.15**	**0.14**		

Month	Details of Power Purchased from MPEB					
	Units Received KWh	Units Received KVAh	Power Factor (2÷3)	Maximum Demand KVA	Payment to MPEB Rs	Per Unit cost of energy Rs/KWh (6÷2)
1	2	3	4	5	6	7
Jan'24	110076	111882	0.9839	396	1588250	14.43
Feb'24	98142	100015	0.9813	554	1497391	15.26
Mar'24	149310	150744	0.9905	979	1921581	12.87
Apr'24	239226	240882	0.9931	1418	2677156	11.19
May'24	295776	296898	0.9962	1536	3204895	10.84
Jun'24	316986	317922	0.9971	1469	3386224	10.68
Jul'24	209808	211805	0.9906	1270	2834478	13.51
Aug'24	319902	321627	0.9946	1988	3967560	12.40
Sep'24	388070	389680	0.9959	2184	4494263	11.58
Oct'24	313280	314640	0.9957	2068	3530940	11.27
Nov'24	201050	202669	0.9920	1180	2590460	12.88
Dec'24	134560	135280	0.9947	776	2123800	15.78
G. Total	**2776186**	**2794044**	**0.9936**	**2184**	**33816998**	**12.18**

Consumption & Generation of DG sets			
Units generated KWh	Quantity of diesel Lts	Cost of diesel Rs	Per Unit cost of energy Rs/KWh (10÷8)
8	9	10	11
14550	4839	453898	31.20
9122	3058	286840	31.44
13694	4604	431487	31.51
13438	4535	425383	31.66
29158	9826	921679	31.61
29031	9781	917458	31.60
16746	5635	528563	31.56
33825	11380	1067444	31.56
46203	15530	1456714	31.53
25260	8505	797769	31.58
11196	3775	354095	31.63
15995	5409	507364	31.72
258218	**86877**	**8148694**	**31.56**

Cost of power Rs(6+10)	Cost of PowerperUnit Rs/KWH (Wo/M) 12÷(2+8)	Monthly Maintenance Expenditure Rs	
		Electrical Rs	DG Sets Rs
12	13	14	15
2042148	16.39	0	0
1784231	16.63	0	40240
2353068	14.44	0	0
3102539	12.28	0	0
4126574	12.70	0	0
4303682	12.44	0	44560
3363041	14.84	0	0
5035004	14.23	0	0
5950977	13.70	0	0
4328709	12.79	0	0
2944555	13.87	0	0
2631164	17.48	0	337312
41965692	**13.83**	**0**	**422112**

Total Cost of Power Rs (12+14+15)	Total Cost of Power Per Unit Rs/KWh(W/M) 16÷(2+8)	Difference between (17-13)
16	17	18
2042148	16.39	0.00
1824471	17.01	0.38
2353068	14.44	0.00
3102539	12.28	0.00
4126574	12.70	0.00
4348242	12.57	0.13
3363041	14.84	0.00
5035004	14.23	0.00
5950977	13.70	0.00
4328709	12.79	0.00
2944555	13.87	0.00
2968476	19.72	2.24
42387804	**13.97**	**0.14**

Month	Backup Generation by all DG sets KWh	Details of Diesel consumption			Unit (kwh) Generated per Ltr of diesel KWh/ltr (2÷3)	Cost of generation per unit Rs/KWh (5÷2)
		Quantity Ltr	Rate Rs/Ltr	Cost Rs (3x4)		
1	2	3	4	5	6	7
Jan'23	14550	4839	93.80	453898	3.01	31.20
Feb'23	9122	3058	93.80	286840	2.98	31.44
Mar'23	13694	4604	93.72	431487	2.97	31.51
Apr'23	13438	4535	93.80	425383	2.96	31.66
May'23	29158	9826	93.80	921679	2.97	31.61
Jun'23	29031	9781	93.80	917458	2.97	31.60
Jul'23	16746	5635	93.80	528563	2.97	31.56
Aug'23	33825	11380	93.80	1067444	2.97	31.56
Sep'23	46203	15530	93.80	1456714	2.98	31.53
Oct'23	25260	8505	93.80	797769	2.97	31.58
Nov'23	11196	3775	93.80	354095	2.97	31.63
Dec'23	15995	5409	93.80	507364	2.96	31.72
Total	**258218**	**86877**		**8148694**	**2.97**	**31.56**

DG Performance Sheet

Month	S1D1 (250KVA)						
	KWH	Diesel Quantity Ltr	Hours Run	KWH/Ltr (2÷3)	Average of Diesel Ltr/Hr (3÷4)	Rate of diesel Rs/Ltr	Cost of Diesel Rs (3x7)
1	2	3	4	5	6	7	8
Jan'23	3605	1150	33.1	3.13	34.74	93.80	107870
Feb'23	330	109	3.2	3.03	34.06	93.80	10224
Mar'23	285	94	3.8	3.03	24.74	93.72	8810
Apr'23	-	-	-	-	-	93.80	-
May'23	309	102	2.9	3.03	35.17	93.80	9568
Jun'23	82	27	0.9	3.04	30.00	93.80	2533
Jul'23	964	318	10.7	3.03	29.72	93.80	29828
Aug'23	1569	532	16.6	2.95	32.05	93.80	49902
Sep'23	1897	628	23.2	3.02	27.07	93.80	58906
Oct'23	743	246	7.4	3.02	33.24	93.80	23075
Nov'23	-	-	-	-	-	93.80	-
Dec'23	217	72	2.6	3.01	27.69	93.80	6754
Sub Total	**10001**	**3278**	**104.4**	**3.05**	**31.40**		**307469**

S1D2 (750KVA)

KWH	Diesel Quantity Ltr	Hours Run	KWH/Ltr (9÷10)	Average of Diesel Ltr/Hr (10÷11)	Rate of diesel Rs/Ltr	Cost of Diesel Rs (10x14)
9	10	11	12	13	14	15
945	320	5.2	2.95	61.54	93.80	30016
1345	450	5	2.99	90.00	93.80	42210
4225	1423	15.7	2.97	90.64	93.72	133364
3629	1226	12.9	2.96	95.04	93.80	114999
7934	2684	25.9	2.96	103.63	93.80	251759
7529	2535	26.0	2.97	97.50	93.80	237783
5396	1817	17.9	2.97	101.51	93.80	170435
7538	2532	23.8	2.98	106.39	93.80	237502
15294	5149	49.3	2.97	104.44	93.80	482976
8527	2875	28.3	2.97	101.59	93.80	269675
3205	1081	11.3	2.96	95.66	93.80	101398
5077	1721	18.3	2.95	94.04	93.80	161430
70644	**23813**	**239.6**	**2.97**	**99.39**		**2233546**

S1D3 (750KVA)

KWH	Diesel Quantity Ltr	Hours Run	KWH/Ltr (16÷17)	Average of Diesel Ltr/Hr (17÷18)	Rate of diesel Rs/Ltr	Cost of Diesel Rs (17x21)
16	17	18	19	20	21	22
-	-	-	-	-	93.80	-
1276	428	4.6	2.98	93.04	93.80	40146
3111	1049	11.1	2.97	94.50	93.72	98312
3244	1094	11.1	2.97	98.56	93.80	102617
1966	664	6.5	2.96	102.15	93.80	62283
-	-	-	-	-	93.80	-
2019	682	7.2	2.96	94.72	93.80	63972
4393	1483	14.2	2.96	104.44	93.80	139105
8294	2791	26.7	2.97	104.53	93.80	261796
6460	2177	20.4	2.97	106.72	93.80	204203
3076	1034	10.8	2.97	95.74	93.80	96989
2294	775	8.6	2.96	90.12	93.80	72695
36133	**12177**	**121.2**	**2.97**	**100.47**		**1142119**

S1D4 (750KVA)

KWH	Diesel Quantity Ltr	Hours Run	KWH/Ltr (23÷24)	Average of Diesel Lit/Hr (24÷25)	Rate of diesel Rs/Ltr	Cost of Diesel Rs (24x28)
23	24	25	26	27	28	29
8945	3018	34.6	2.96	87.23	93.80	283088
5985	2011	22.7	2.98	88.59	93.80	188632
4568	1536	16.5	2.97	93.09	93.72	143954
4252	1436	13.2	2.96	108.79	93.80	134697
8516	2875	28.5	2.96	100.88	93.80	269675
9606	3245	30.9	2.96	105.02	93.80	304381
3353	1129	11.3	2.97	99.91	93.80	105900
7784	2623	25.8	2.97	101.67	93.80	246037
7365	2481	23.3	2.97	106.48	93.80	232718
3026	1023	10.5	2.96	97.43	93.8	95957
2367	802	8.5	2.95	94.35	93.80	75228
6489	2207	23.6	2.94	93.52	93.8	207017
72256	**24386**	**249.4**	**2.96**	**97.78**		**2287284**

S1D5 (750KVA)

KWH	Diesel Quantity Ltr	Hours Run	KWH/Ltr (30÷31)	Average of Diesel Lit/Hr (31÷32)	Rate of diesel Rs/Ltr	Cost of Diesel Rs (31x35)
30	31	32	33	34	35	36
-	-	-	-	-	93.80	-
-	-	-	-	-	93.80	-
1082	360	4.1	3.01	87.80	93.72	33739
2092	705	7.0	2.97	100.71	93.80	66129
9731	3264	31.5	2.98	103.62	93.80	306163
11137	3750	35.3	2.97	106.23	93.80	351750
4171	1409	14	2.96	100.64	93.80	132164
11256	3790	35.4	2.97	107.06	93.80	355502
12337	4145	39.7	2.98	104.41	93.80	388801
5465	1839	17.8	2.97	103.31	93.80	172498
2235	754	7.7	2.96	97.92	93.80	70725
1591	539	5.8	2.95	92.93	93.80	50558
61097	**20555**	**198.3**	**2.97**	**103.66**		**1928030**

S2D1 (250 KVA)						
KWH	Diesel Quantity Ltr	Hours Run	KWH/Ltr (37÷38)	Average of Diesel Lit/Hr (38÷39)	Rate of diesel Rs/Ltr	Cost of Diesel Rs (38x42)
37	38	39	40	41	42	43
-	-	-	-	-	93.80	-
-	-	-	-	-	93.80	-
-	-	-	-	-	93.72	-
-	-	-	-	-	93.80	-
-	-	-	-	-	93.80	-
417	138	6	3.02	23	93.80	12944
-	-	-	-	-	93.80	-
-	-	-	-	-	93.80	-
317	105	5.6	3.02	18.75	93.80	9849
352	117	6.5	3.01	18	93.80	10975
-	-	-	-	-	93.80	-
260	73	4	3.56	18.25	93.80	6847
1346	**433**	**22.1**	**3.11**	**19.59**		**40615**

S2D2 (250 KVA)						
KWH	Diesel Quantity Ltr	Hours Run	KWH/Ltr (44÷45)	Average of Diesel Lit/Hr (45÷46)	Rate of diesel Rs/Ltr	Cost of Diesel Rs (44x49)
44	45	46	47	48	49	50
1055	351	19.5	3.01	18.00	93.80	32924
186	60	3.1	3.10	19.35	93.80	5628
423	142	7.8	2.98	18.21	93.72	13308
221	74	3.2	2.99	23.13	93.80	6941
702	237	12.5	2.96	19.0	93.80	22231
260	86	4.6	3.02	18.7	93.80	8067
843	280	9.4	3.01	29.8	93.80	26264
1285	420	18.5	3.06	22.7	93.80	39396
699	231	10.5	3.03	22.0	93.80	21668
687	228	9.5	3.01	24.00	93.80	21386.4
313	104	3.6	3.01	28.89	93.80	9755
67	22	1.3	3.05	16.92	93.80	2064
6741	**2235**	**104**	**3.02**	**22**		**209632**

Total			
KWH	**Hours Run**	**Diesel Ltr**	**Amt Rs**
51	52	53	54
14550	**92.4**	**4839**	**453898**
9122	**38.6**	**3058**	**286840**
13694	**59.0**	**4604**	**431487**
13438	**47.4**	**4535**	**425383**
29158	**107.8**	**9826**	**921679**
29031	**103.7**	**9781**	**917458**
16746	**70.5**	**5635**	**528563**
33825	**134.3**	**11380**	**1067444**
46203	**178.3**	**15530**	**1456714**
25260	**100.4**	**8505**	**797769**
11196	**41.9**	**3775**	**354095**
15995	**64.2**	**5409**	**507364**
258218	**1038.5**	**86877**	**8148694**

Annexure 2

Power Profile Of AU-Gwalior	
Sanctioned Load KVA	2450
Released Load KVA	2450
Billing Load KVA	2205
Length of line Km	0.5
Voltage KV	33
Meter No.	XE481822
Meter Make	Secure
Line CT Ratio A	50/5
Line PT Ratio KV/V	33/110
Meter CT Ratio A	-/5
Meter PT Ratio KV/V	33/110
Multiplying Factor (MF)	10
Demand charges	Rs.501 per KVA
Unit Charges	Rs.7.53 per KWh
No Of Transformer	2 Nos 1500 KVA each & 1 No 2500 KVA
No of DG Sets	4 Nos x750 KVA & 1No x250 KVA
Installed Solar Capacity	307 KWp

Solar Generation & Carbon Emission		
Month	**Generation in KWH**	**Carbon Emission in tonnes**
Jan'24	23474	1.9
Fab'24	33877	2.8
Mar'24	44234	3.7
Apr'24	44350	3.7
May'24	44677	3.7
Jun'24	37618	3.1
Jul'24	32841	2.7
Aug'24	31339	2.6
Sep'24	29771	2.5
Oct'24	35202	2.9
Nov'24	27699	2.3
Dec'24		
Total	**385082**	**32.0**

Solar Profile

AU, Gwalior							
S. No.	Block	Capacity of Plant (KWp)	Capacity of Inverter (KW)	Modules	String	Inverters	
				Nos.	Nos.	Nos.	Rating
1	A	160	170	501	25	4	3x5z0 KW + 1x20 KW
2	B	83	80	260	13	2	1x50 KW + 1X30 KW
3	C	64	60	200	10	2	2x30 KW
Total		**307.2**	**310**	**961**	48	**8**	

Solar Saving

Month	Solar			MPEB			Export Unit (KWH) by Solar to The MPEB
	Unit Generated by Solar in KWH	Rate (Rs/KWh)	Payment to Clean Max Amount Rs	Units Received KWh	Unit cost of energy from MPEB (Rs)	Payment to MPEB Amount Rs	
Jan'24	23474	5.10	119717	135870	15.61	2120470	0
Feb'24	33877	5.10	172773	122420	16.36	2002300	10
Mar'24	44234	5.10	225594	113260	17.43	1973924	310
Apr'24	44350	5.10	226185	293040	10.67	3127345	920
May'24	44677	5.10	227853	425310	9.85	4189459	10
Jun'24	37618	5.10	191852	419540	9.75	4092559	0
Jul'24	32841	5.10	167487	342110	9.24	3162799	70
Aug'24	31339	5.10	159827	380790	8.97	3416121	210
Sep'24	29771	5.10	151833	392470	9.62	3775511	50
Oct'24							
Nov'24							
Dec'24							
Total	**322181**	**5.05**	**1643121**	**2624810**	**10.61**	**27860488**	**1580**

	Without Solar			Approx. Saving Amount on Solar (Rs)	Approx. % of Saving on Solar
Month	**Unit Purchased from MPEB in KWh**	**Unit cost of energy from MPEB Rs**	**Amount**		
	159344	15.61	2486820	246632	9.92
Jan'24	156287	16.36	2556228	381319	14.92
Feb'24	157184	17.43	2739445	545330	19.91
Mar'24	336470	10.67	3590833	247122	6.88
Apr'24	469977	9.85	4629445	212232	4.58
May'24	457158	9.75	4459518	175107	3.93
Jun'24	374881	9.24	3465762	136123	3.93
Jul'24	411919	8.97	3695381	121317	3.28
Aug'24	422191	9.62	4061425	134562	3.31
Sep'24					
Oct'24					
Nov'24					
Dec'24	**2945411**	**10.76**	**31684857**	**2199744**	**6.94**

Note:-	**Avg bill p/m 2024 in Rs lacs (Jan'24 to Sep'24)**	**30.96**
	Avg bill p/m 2023 in Rs lacs (Jan'23 to Dec'23)	**28.18**
	Total Contacted load	**2450 KVA**
	Installed Solar Capacity	**307 Kwp**
	After Solar Installation Reduce MPEB bill amount avg. In 2024 (Approx.)	**7%**

Annexure 3

Fig 1: Solar Panels

Fig 2: Solar Light in the Campus

Fig 3: Transformer

Fig 4: DG Set

Fig 5: HT Panel

Fig6: LT Panel 1

Fig 7: LT Panel 2