Measuring Low Carbon Energy Usage at Manipal University Jaipur

As part of its commitment to sustainability, Manipal University Jaipur (MUJ) has implemented measures to track and increase the use of low-carbon energy sources on campus. Understanding and quantifying the amount of low-carbon energy consumed by the university is a crucial step toward reducing its carbon footprint and achieving environmental goals. At MUJ, the primary sources of low-carbon energy include solar power, energy-efficient technologies, and efforts to integrate renewable energy into the campus infrastructure. The university has installed solar panels across several buildings, which significantly contribute to the overall energy consumption, while also reducing dependence on conventional fossil fuels. MUJ's efforts to use energy-efficient lighting, such as LED systems, further enhance its low-carbon strategy.

Measuring Low Carbon Energy Use

Energy Monitoring Systems

MUJ has adopted sophisticated energy monitoring systems to track energy usage across the campus. These systems help to quantify the amount of energy generated from renewable sources, primarily solar power. By tracking the energy output from the solar panels installed on campus buildings, the university can measure the contribution of clean energy to its overall consumption.

Smart Meters and Sensors

MUJ utilizes smart meters and energy sensors to accurately measure energy consumption from various sources. These devices provide real-time data on energy use in different campus zones, helping identify how much energy comes from low-carbon sources. The data is analyzed to compare renewable energy usage against traditional sources, enabling targeted improvements.

Carbon Accounting

The university has introduced carbon accounting mechanisms to assess its carbon emissions from energy consumption. MUJ can quantify the environmental benefits of its renewable energy initiatives, by calculating the emissions reduction achieved using low-carbon energy. This is done by comparing energy generated through solar panels with the emissions that would have resulted from using non-renewable energy.

Energy Audits

Periodic energy audits are conducted to evaluate the effectiveness of low-carbon energy use and identify areas for improvement. These audits not only measure the amount of renewable energy used but also assess energy efficiency measures like smart lighting, efficient HVAC systems, and overall building energy performance.

Public Reporting and Benchmarking

MUJ is committed to transparent sustainability reporting. The data on low-carbon energy usage is shared in annual sustainability reports, which track the university's progress toward reducing its environmental impact. These reports serve as benchmarks for setting new targets for renewable energy use and carbon reduction.

Through the integration of renewable energy sources like solar power, energy-efficient technologies, and comprehensive monitoring systems, Manipal University Jaipur is actively working toward a low-carbon future. By measuring and optimizing its use of low-carbon energy, MUJ demonstrates leadership in sustainability, contributing to global efforts to combat climate change while setting a precedent for educational institutions in India.

Picture 1: solar panel installed on Manipal university building

Picture 2: solar panels on Mess building

MANIPAL UNIVERSITY JAIPUR
(University under Section 2(f) of the UGC Act)

EHS alliance

ENVIRONMENT, GREEN & ENERGY AUDIT

Conducted For:

MANIPAL UNIVERSITY JAIPUR
University under Section 2(f) of the UGC Act

MANIPAL UNIVERSITY JAIPUR

From:

EHS Alliance Services

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This quotation/offer is valid for a period of [30] days

EHSAP0308
Date: 09-08-2023

Kind Attention: **The Registrar**
Sikkim Manipal University - Jaipur
E-Mail: admin.office@jaipur.manipal.edu

ENVIRONMENT, GREEN & ENERGY AUDIT

Introduction

We are environmental health and safety professionals who are not afraid to challenge and innovate. A wide range of industrial and construction safety training programs and audits are presented in multiple formats and media for your convenience.
A *one roof* Consultancy is available for a variety of environment, health, and safety requirements of clients. You will find our culture is one of pride, passion, support, and integrity, and we hope you will find us a great business to work with, or for.

Scope of work

The scope of the environment & green audit program shall encompass the examination and evaluation of various environmental measures, initiatives, and practices in compliance with the following standards and regulatory requirements:

- ISO 14001:2015 – Environmental Management System
- ISO 50001:2018 - Energy management systems
- ISO 14011: 1996 Environmental Auditing Guidelines
- ISO 19011: Guidelines for Auditing Management Systems
- Environmental Protection Act, 1986 as amended
- Air (Prevention & Control of Pollution) Emission Act 1981 as amended
- Water (Prevention & Control of Pollution) Act 1974 as amended
- The Water (Prevention & Control of Pollution) Cess Act, 1977 as amended
- Batteries Rules, 2010 as amended
- Noise Pollution (Regulations and Control) Rules, 2000 as amended
- Manufacture, Storage, and Import of Hazardous Chemical Rules, 2000 as amended
- The Bio-Medical Waste (M&H) Rules, 1998 as amended
- Waste Management Rules, 2016

Objectives:

→ Identify and control the environmental impact of its activities, products, or services;
→ Improve its environmental performance continually, and
→ Implement a systematic approach to setting environmental objectives and targets, to achieving these, and to demonstrating that they have been achieved.

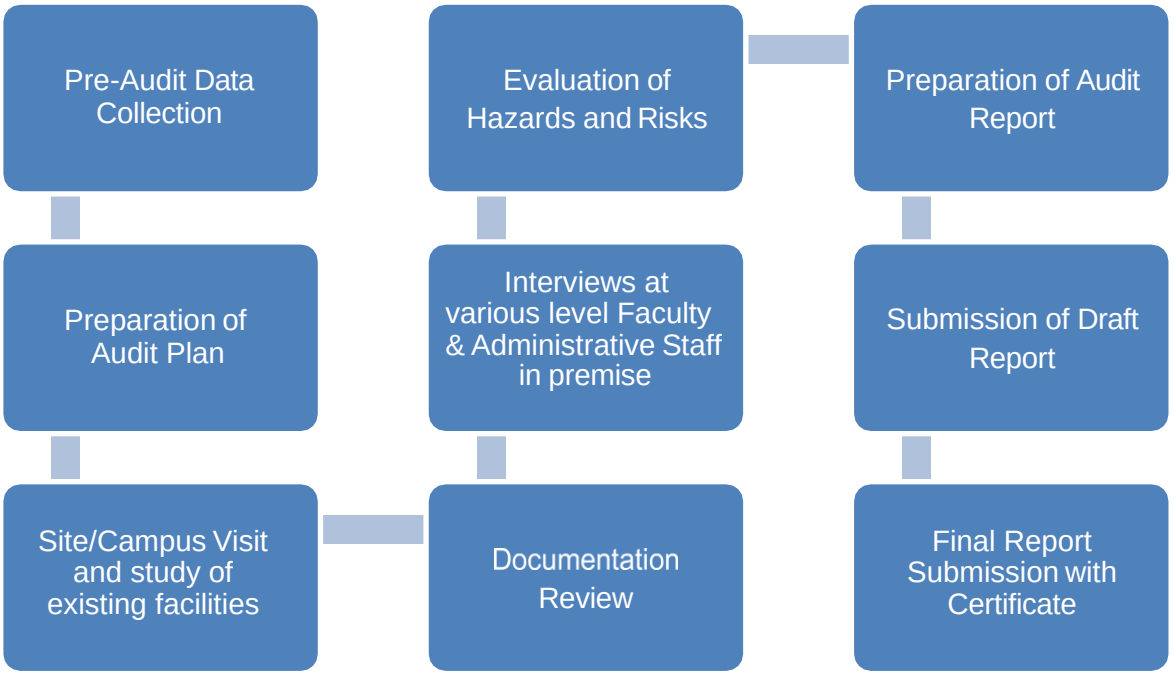
This audit included:

- Review of all environment-related applicable legal requirements and other requirements to which the organization subscribes. This includes regulatory compliance documents like statutory permissions / NOCs from statutory authorities, Pollution control board-related norms, Emergency Preparedness Plans, Spill Prevention Plans, etc.
- All environmental monitoring reports pertaining to air pollution, water pollution, noise pollution, and the status of results against applicable standards.

- Examination of existing environmental management practices and procedures, including those associated with procurement and contracting activities.
- Monitoring and review of all preventive maintenance of equipment connected with direct or indirect pollution.
- Chemical management like storage, handling and use of chemicals, special arrangement for flammable chemicals, and consumption tracking etc.
- Waste management at site that includes storage and disposal, use of PPEs, hygiene conditions, and any means of recycling through vendors. Hazardous waste and e-waste management and disposal in compliance with applicable norms
- Review of all critical areas and production processes in premise that has a connection with environmental aspects and impacts.
- Review of all the systems and processes in relation with the environment that is part of the environmental management system.
- Review of overall environmental performance and practices of contractors and suppliers.
- Review of extraction and distribution of raw material and natural resources. Distribution will include the use and end life of the product.
- Analyzing the awareness level in the premise for environmental policy and objectives which includes competency, awareness, and understanding of roles and responsibility.
- Operational control of all those operations that are associated with its identified environmental aspects and to check that control is effective in reducing the adverse impact associated with them.

Thus, the environment audit will include all the components of the system viz. management policy, training, design (Process, Mechanical, Electrical, etc.) aspect, layout and construction of the building, operation & maintenance procedures of equipment related to environmental aspects, emergency plans, and optimization of natural resources. The scope will be flexible in accordance with the area/location of audit according to control over the environmental systems and procedures.

Audit Procedure



The energy audit conducted for the academic buildings of Manipal University Jaipur reveals that the integration of solar energy has significantly reduced dependency on grid power, contributing to lower electricity costs and a reduction in the building's carbon footprint. The solar photovoltaic (PV) system generates a substantial portion of the building's energy requirements, demonstrating the university's commitment to sustainable energy practices.

Key Findings and Recommendations:

- **Energy Efficiency Improvements**: While solar energy meets part of the building's needs, there is still potential for further energy savings by implementing energy-efficient appliances, upgrading lighting to LED, and enhancing insulation and HVAC efficiency.
- **Optimization of Solar System Performance**: Regular maintenance of the solar panels (such as cleaning and monitoring for faults) is essential to maintain peak efficiency and maximize output, ensuring that the building leverages the full potential of solar power generation.
- **Energy Usage Patterns**: The audit highlights areas where energy consumption can be reduced during peak hours. Implementing automated systems to control lighting, heating, and cooling based on occupancy could further decrease energy demand.
- **Battery Storage and Backup**: To enhance energy reliability, especially during periods of low sunlight, installing battery storage systems could be beneficial. This would allow excess solar energy generated during the day to be stored and used during the night or on cloudy days, maximizing the use of renewable energy.
- **Educational Impact**: The use of solar energy on campus can serve as a living example of sustainable practices for students, potentially encouraging them to adopt similar practices in their own lives. Integrating real-time energy monitoring and displaying it publicly could further promote awareness.

Conclusion: The solar energy system provides a resilient and eco-friendly power source that aligns with the university’s sustainability goals. However, additional energy conservation measures and optimization of existing systems will further enhance energy efficiency, reduce costs, and improve overall environmental impact. By combining solar energy generation with efficient building management strategies, the academic building can serve as a model of sustainable energy use within the educational sector.

We assure you for our highest professional services. Warm regards,

Dr. Uday Pratap
Lead Auditor – EMS, EnMS, WASH, PDI
For EHS Alliance Services

Weekly O&M Review Report

25th Sep 23 – 30th Sep 23

2 STP + 2 WTP

Manipal University Jaipur, Jaipur

Aquacare Solutions
Enviro Engineers

Contents

- Production summary & trend
- Quality parameters of treated water
- Equipment maintenance
- Operational difficulties & status of Action taken

Aquacare Solutions
Enviro Engineers

Production Summary :

Quantity of treated water in STP & WTP

Date	150 STP (KLD)	350 STP(KLD)	GH UGR (80 KLD)	MUJ WTP (240 KLD)
01-11-23	-	214	38	-
02-11-23	-	198	32	-
03-11-23	-	186	39	-
04-11-23	-	212	35	-
05-11-23	-	74	39	-

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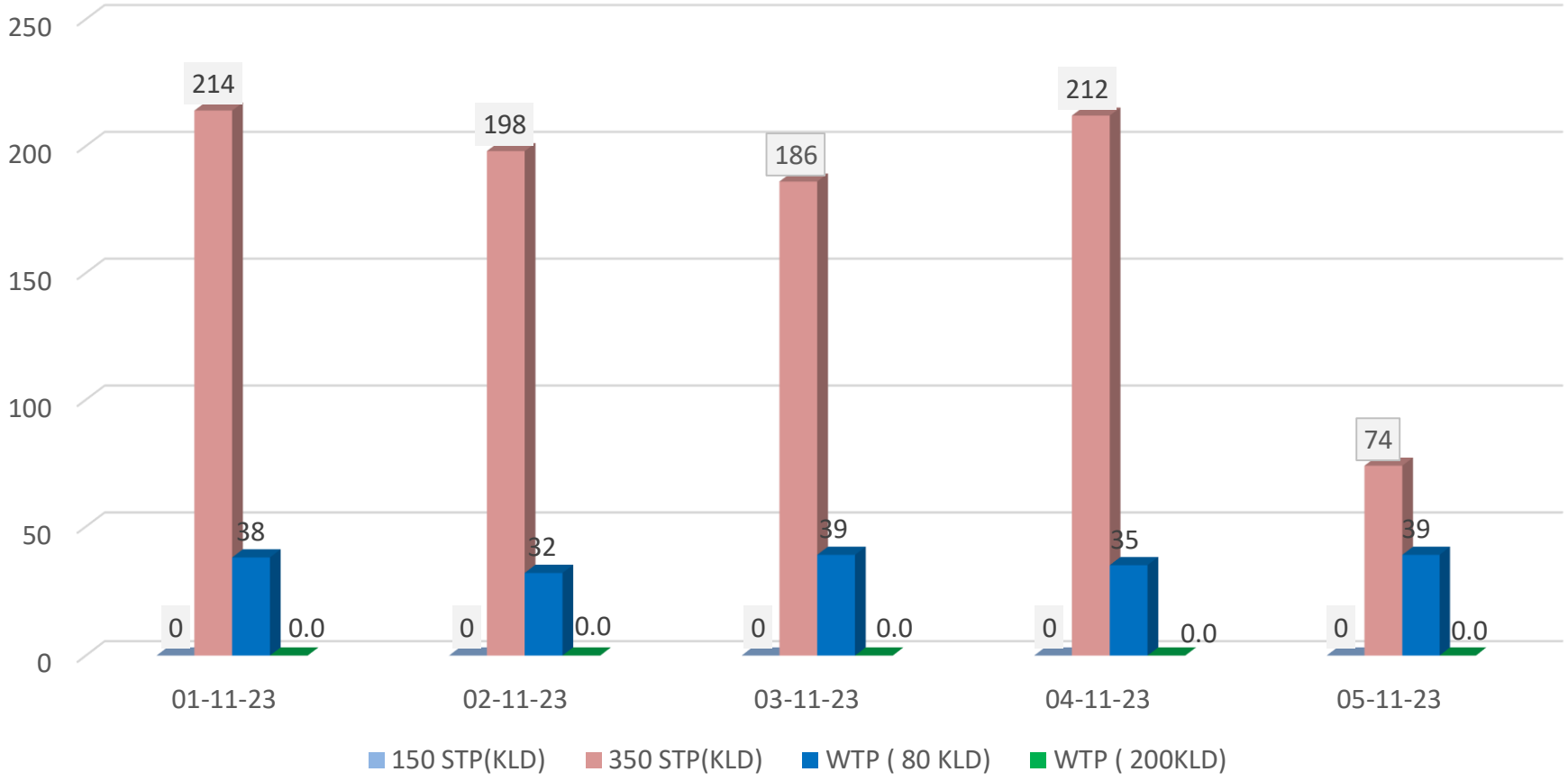
Production Trend:

Quantity of treated water in STP & WTP



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Quality parameters of Treated water:

Sewage Treatment Plant:

	150 KLD STP			350 KLD STP		
Date	pH	TDS (ppm)	TURDIDITY (ppm)	pH	TDS (ppm)	TURDIDITY (ppm)
01-11-23	-	-	-	7.8	781	-
02-11-23	-	-	-	7.7	787	-
03-11-23	-	-	-	7.6	766	-
04-11-23	-	-	-	7.8	768	-
05-11-23	-	-	-	7.9	806	-

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Enviro Engineers

Quality parameters of treated water:

Water Treatment plant:

	MUJ UGR					GH UGR				
Date	pH	TDS (ppm)	Hardness (ppm)	Turbidity(ppm)	FRC (ppm)	pH	TDS (ppm)	Hardness (ppm)	FRC (ppm)	Turbidity(ppm)
01-11-23	-	-	-	-	-	7.6	678	14	0.2	-
02-11-23	-	-	-	-	-	7.4	669	28	0.2	-
03-11-23	-	-	-	-	-	7.3	780	40	0.2	-
04-11-23	-	-	-	-	-	7.6	700	60	0.2	-
05-11-23	-	-	-	-	-	7.6	697	70	0.2	-

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Thank you...!!!

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Weekly O&M Review Report

06th Nov 23 – 12th Nov 23

2 STP + 2 WTP

Manipal University Jaipur, Jaipur

Aquacare Solutions
Enviro Engineers

Contents

- Production summary & trend
- Quality parameters of treated water
- Equipment maintenance
- Operational difficulties & status of Action taken

Aquacare Solutions
Enviro Engineers

Production Summary :

Quantity of treated water in STP & WTP

Date	150 STP (KLD)	350 STP(KLD)	GH UGR (80 KLD)	MUJ WTP (240 KLD)
06-11-23	-	181	32	-
07-11-23	-	287	39	-
08-11-23	-	289	25	-
09-11-23	-	287	32	-
10-11-23	-	214	28	-
11-11-23	-	73	21	-
12-11-23	-	115	22	-

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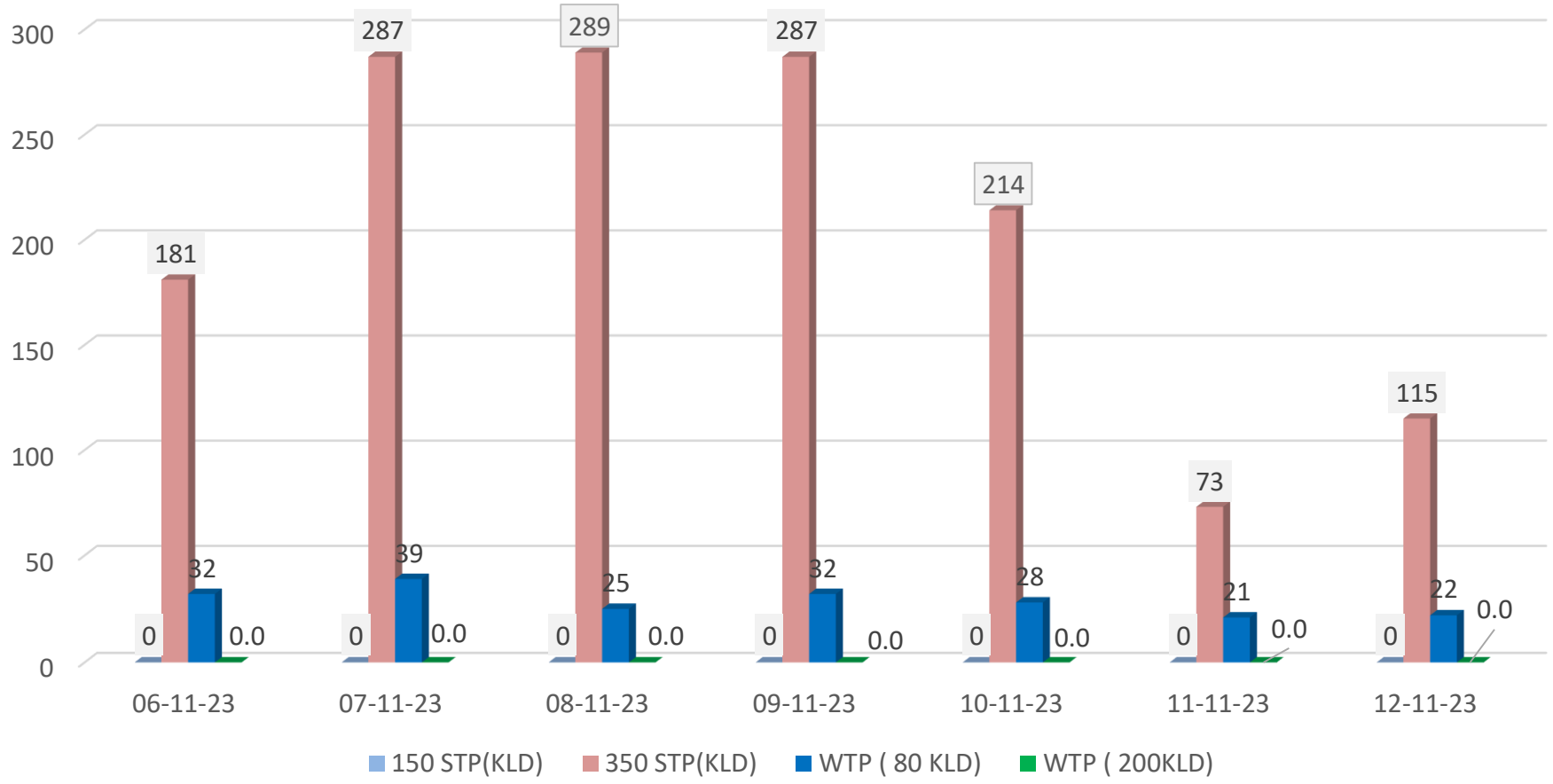
Production Trend:

Quantity of treated water in STP & WTP



Aquacare Solutions
Enviro Engineers

Quality parameters of Treated water:

Sewage Treatment Plant:

	150 KLD STP			350 KLD STP		
Date	pH	TDS (ppm)	TURDIDITY (ppm)	pH	TDS (ppm)	TURDIDITY (ppm)
06-11-23	-	-	-	7.7	804	-
07-11-23	-	-	-	7.6	790	-
08-11-23	-	-	-	7.8	814	-
09-11-23	-	-	-	7.8	828	-
10-11-23	-	-	-	8.0	793	-
11-11-23	-	-	-	7.9	821	-
12-11-23	-	-	-	8.0	812	-

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Quality parameters of treated water:

Water Treatment plant:

	MUJ UGR					GH UGR				
Date	pH	TDS (ppm)	Hardness (ppm)	Turbidity(ppm)	FRC (ppm)	pH	TDS (ppm)	Hardness (ppm)	FRC (ppm)	Turbidity(ppm)
06-11-23	-	-	-	-	-	7.5	691	6	0.2	-
07-11-23	-	-	-	-	-	7.6	703	8	0.2	-
08-11-23	-	-	-	-	-	7.4	708	18	0.2	-
09-11-23	-	-	-	-	-	7.6	724	30	0.2	-
10-11-23	-	-	-	-	-	7.4	721	50	0.2	-
11-11-23	-	-	-	-	-	7.6	709	75	0.2	-
12-11-23	-	-	-	-	-	7.6	711	75	0.2	-

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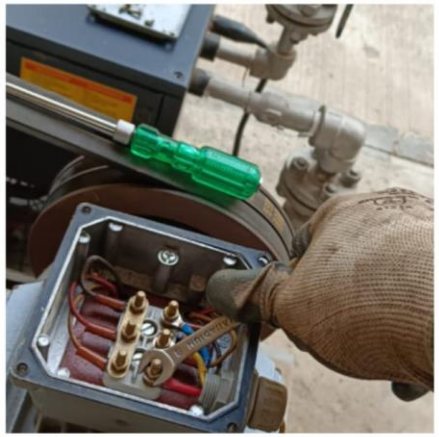
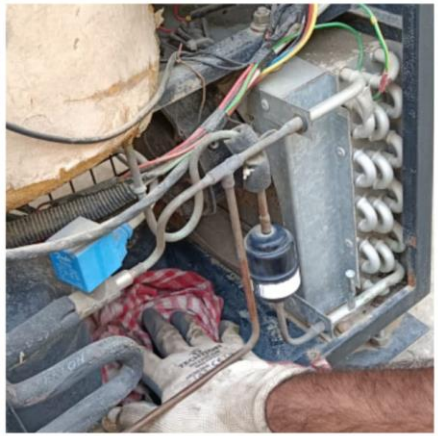
Equipment Maintenance/ Improvements :

1.350 KLD Compressor Oil Changed.

2. 350 KLD M- Cleaning pump PM Done.







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Thank you...!!!

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Weekly O&M Review Report

13th Nov 23 – 19th Nov 23

2 STP + 2 WTP

Manipal University Jaipur, Jaipur

Aquacare Solutions
Enviro Engineers

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Aquacare Solutions
Enviro Engineers

Production Summary :

Quantity of treated water in STP & WTP

Date	150 STP (KLD)	350 STP(KLD)	GH UGR (80 KLD)	MUJ WTP (240 KLD)
13-11-23	-	96	15	-
14-11-23	-	81	21	-
15-11-23	-	89	28	-
16-11-23	-	167	25	-
17-11-23	-	197	35	35
18-11-23	-	137	30	56
19-11-23	-	84	38	81

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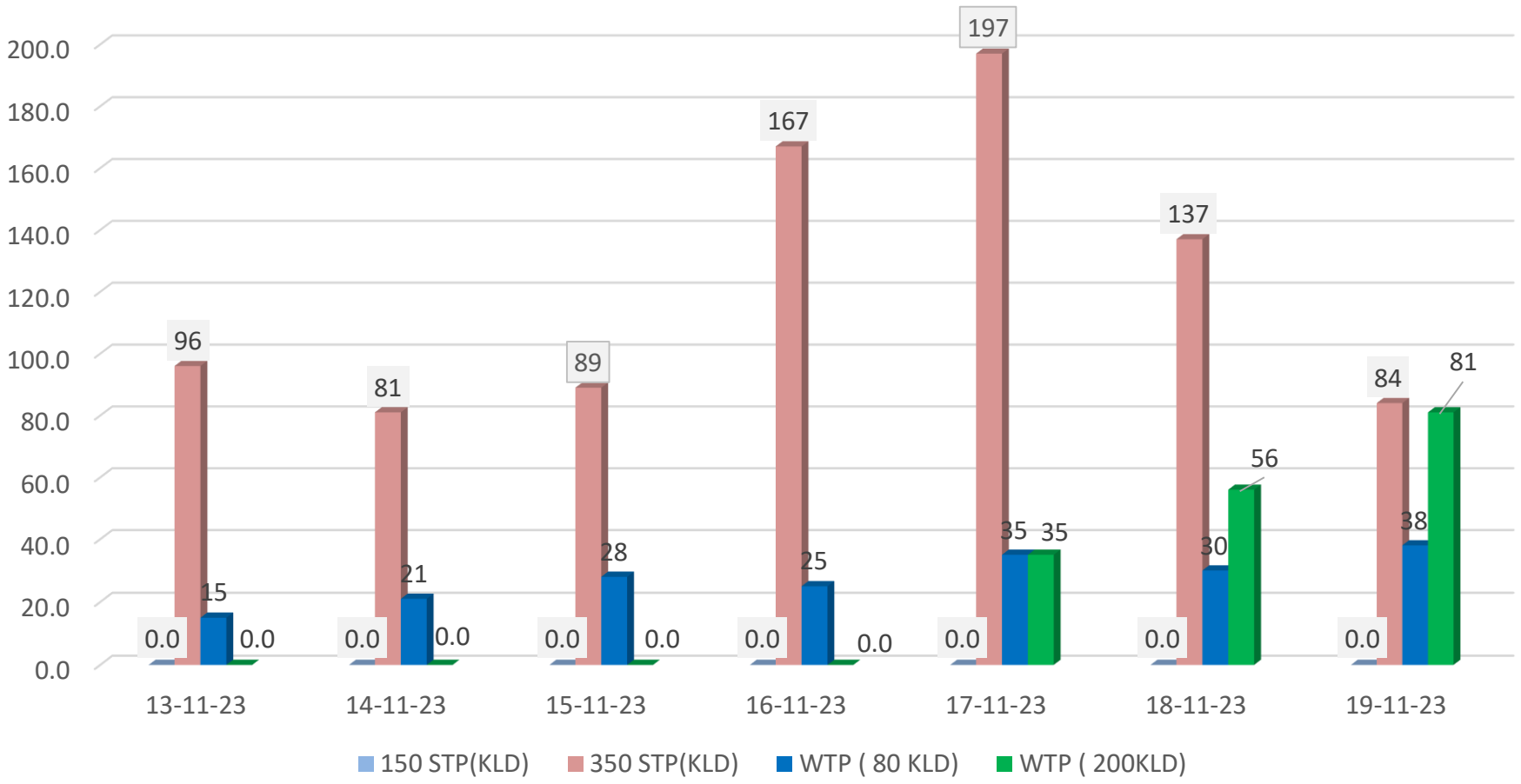
Production Trend:

Quantity of treated water in STP & WTP



Aquacare Solutions
Enviro Engineers

Quality parameters of Treated water:

Sewage Treatment Plant:

	150 KLD STP			350 KLD STP		
Date	pH	TDS (ppm)	TURDIDITY (ppm)	pH	TDS (ppm)	TURDIDITY (ppm)
13-11-23	-	-	-	8.1	810	-
14-11-23	-	-	-	7.9	827	-
15-11-23	-	-	-	7.8	820	-
16-11-23	-	-	-	7.9	804	-
17-11-23	-	-	-	8.1	704	-
18-11-23	-	-	-	7.9	686	-
19-11-23	-	-	-	8.0	678	-

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Enviro Engineers

Quality parameters of treated water:

Water Treatment plant:

	MUJ UGR					GH UGR				
Date	pH	TDS (ppm)	Hardness (ppm)	Turbidity(ppm)	FRC (ppm)	pH	TDS (ppm)	Hardness (ppm)	FRC (ppm)	Turbidity(ppm)
13-11-23	-	-	-	-	-	7.6	697	6	0.2	-
14-11-23	-	-	-	-	-	7.5	699	8	0.2	-
15-11-23	-	-	-	-	-	7.4	694	14	0.2	-
16-11-23	-	-	-	-	-	7.5	714	20	0.2	-
17-11-23	7.9	739	30	-	0.2	7.4	678	34	0.2	-
18-11-23	7.8	721	50	-	0.2	7.5	699	50	0.2	-
19-11-23	7.5	724	70	-	0.2	7.6	696	75	0.2	-

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Thank you...!!!

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Weekly O&M Review Report

20th Nov 23 – 26th Nov 23

2 STP + 2 WTP

Manipal University Jaipur, Jaipur

Aquacare Solutions
Enviro Engineers

Contents

- Production summary & trend
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- Equipment maintenance
- Operational difficulties & status of Action taken

Aquacare Solutions
Enviro Engineers

Production Summary :

Quantity of treated water in STP & WTP

Date	150 STP (KLD)	350 STP(KLD)	GH UGR (80 KLD)	MUJ WTP (240 KLD)
20-11-23	-	195	28	84
21-11-23	-	191	39	67
22-11-23	-	187	39	77
23-11-23	-	212	31	56
24-11-23	-	272	45	77
25-11-23	-	120	27	70
26-11-23	-	93	36	70

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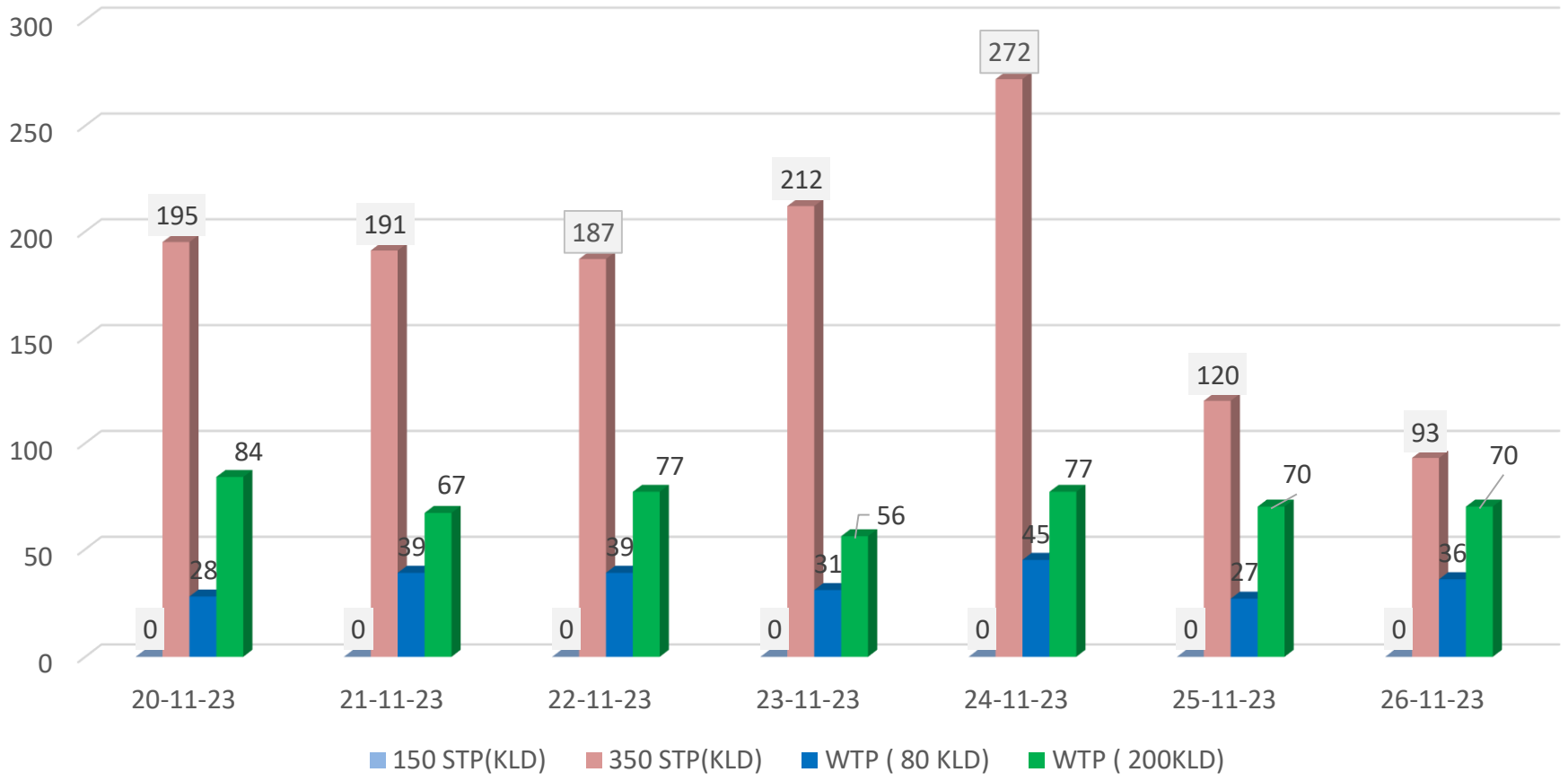
Enviro Engineers

Production Trend:

Quantity of treated water in STP & WTP



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Quality parameters of Treated water:

Sewage Treatment Plant:

	150 KLD STP			350 KLD STP		
Date	pH	TDS (ppm)	TURDIDITY (ppm)	pH	TDS (ppm)	TURDIDITY (ppm)
20-11-23	-	-	-	7.9	702	-
21-11-23	-	-	-	8.0	681	-
22-11-23	-	-	-	7.9	697	-
23-11-23	-	-	-	8.1	769	-
24-11-23	-	-	-	8.3	779	-
25-11-23	-	-	-	8.1	770	-
26-11-23	-	-	-	8.1	779	-

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Quality parameters of treated water:

Water Treatment plant:

	MUJ UGR					GH UGR				
Date	pH	TDS (ppm)	Hardness (ppm)	Turbidity(ppm)	FRC (ppm)	pH	TDS (ppm)	Hardness (ppm)	FRC (ppm)	Turbidity(ppm)
20-11-23	7.7	723	90	-	0.2	7.4	693	75	0.2	-
21-11-23	7.6	705	18	-	0.2	7.6	718	75	0.2	-
22-11-23	7.6	702	24	-	0.2	7.4	684	10	0.2	-
23-11-23	7.7	714	32	-	0.2	7.5	670	16	0.2	-
24-11-23	7.6	715	50	-	0.2	7.6	689	24	0.2	-
25-11-23	7.8	738	80	-	0.2	7.5	709	30	0.2	-
26-11-23	7.7	765	18	-	0.2	7.6	710	40	0.2	-

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Thank you...!!!

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Enviro Engineers

Weekly O&M Review Report

27th Nov 23 – 30th Nov 23

2 STP + 2 WTP

Manipal University Jaipur, Jaipur

Aquacare Solutions
Enviro Engineers

Contents

- Production summary & trend
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- Equipment maintenance
- Operational difficulties & status of Action taken

Aquacare Solutions
Enviro Engineers

Production Summary :

Quantity of treated water in STP & WTP

Date	150 STP (KLD)	350 STP(KLD)	GH UGR (80 KLD)	MUJ WTP (240 KLD)
27-11-23	-	199	38	84
28-11-23	-	184	39	89
29-11-23	-	176	32	91
30-11-23	-	164	32	91

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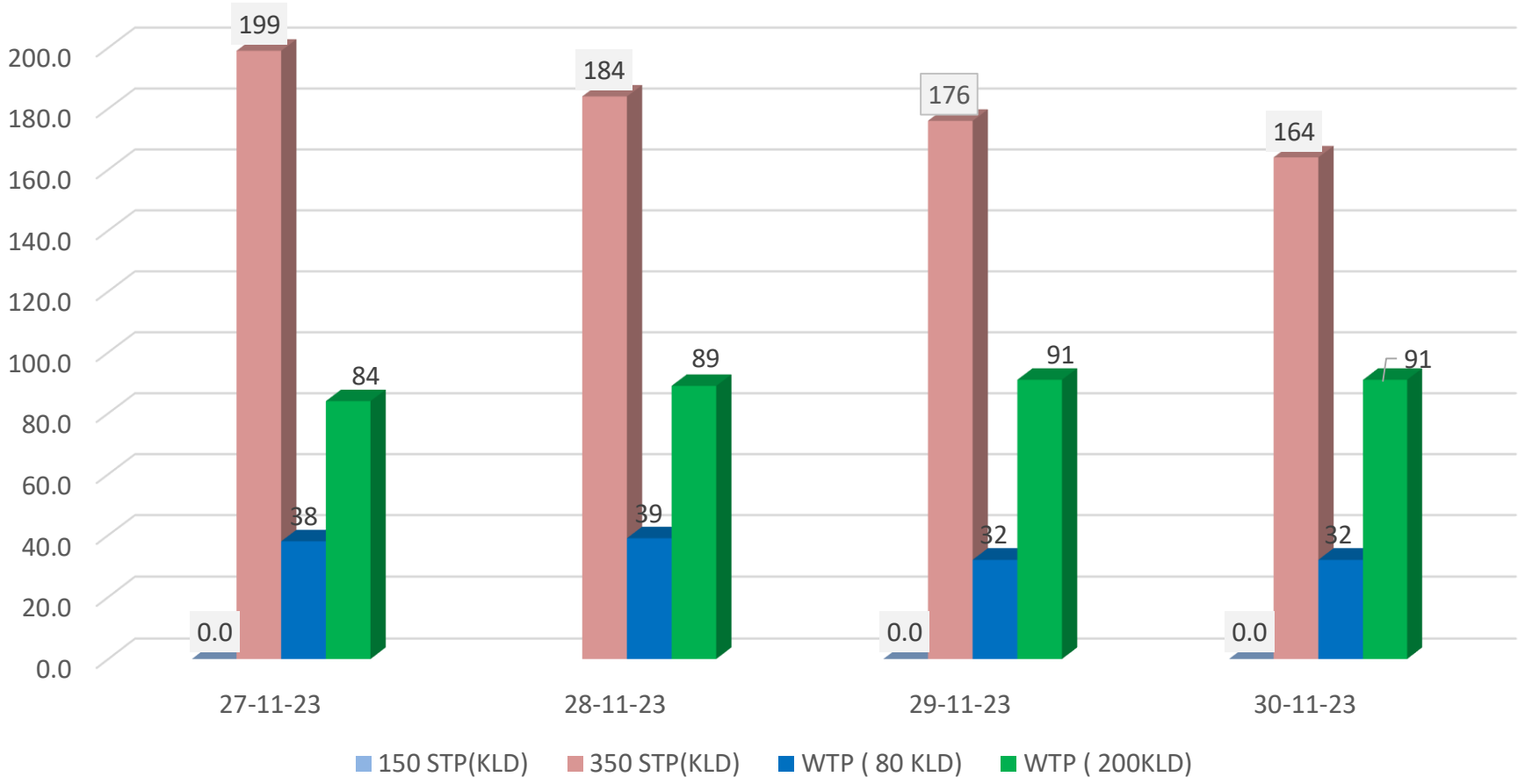
Enviro Engineers

Production Trend:

Quantity of treated water in STP & WTP



Aquacare Solutions
Enviro Engineers

Quality parameters of Treated water:

Sewage Treatment Plant:

	150 KLD STP			350 KLD STP		
Date	pH	TDS (ppm)	TURDIDITY (ppm)	pH	TDS (ppm)	TURDIDITY (ppm)
27-11-23	-	-	-	7.5	904	-
28-11-23	-	-	-	7.4	945	-
29-11-23	-	-	-	7.4	924	-
30-11-23						

Aquacare Solutions
Enviro Engineers

Quality parameters of treated water:

Water Treatment plant:

	MUJ UGR					GH UGR				
Date	pH	TDS (ppm)	Hardness (ppm)	Turbidity(ppm)	FRC (ppm)	pH	TDS (ppm)	Hardness (ppm)	FRC (ppm)	Turbidity(ppm)
27-11-23	7.4	751	30	-	0.2	7.6	702	50	0.2	-
28-11-23	7.6	743	50	-	0.2	7.6	691	75	0.2	-
29-11-23	7.6	742	80	-	0.2	7.3	706	100	0.2	-
30-11-23	7.5	738	100	-	0.2	7.5	681	6	0.2	

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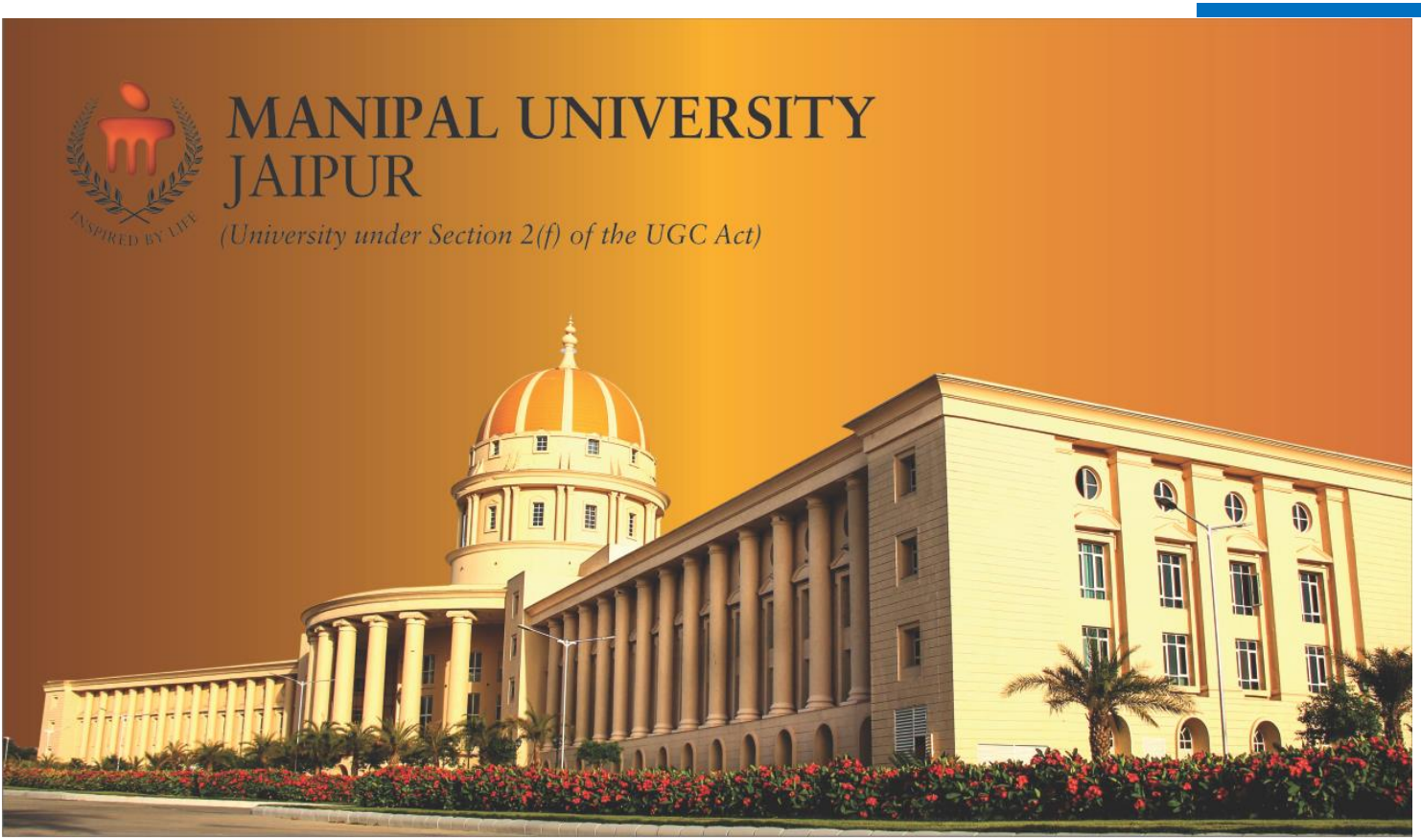
Enviro Engineers

Thank you...!!!

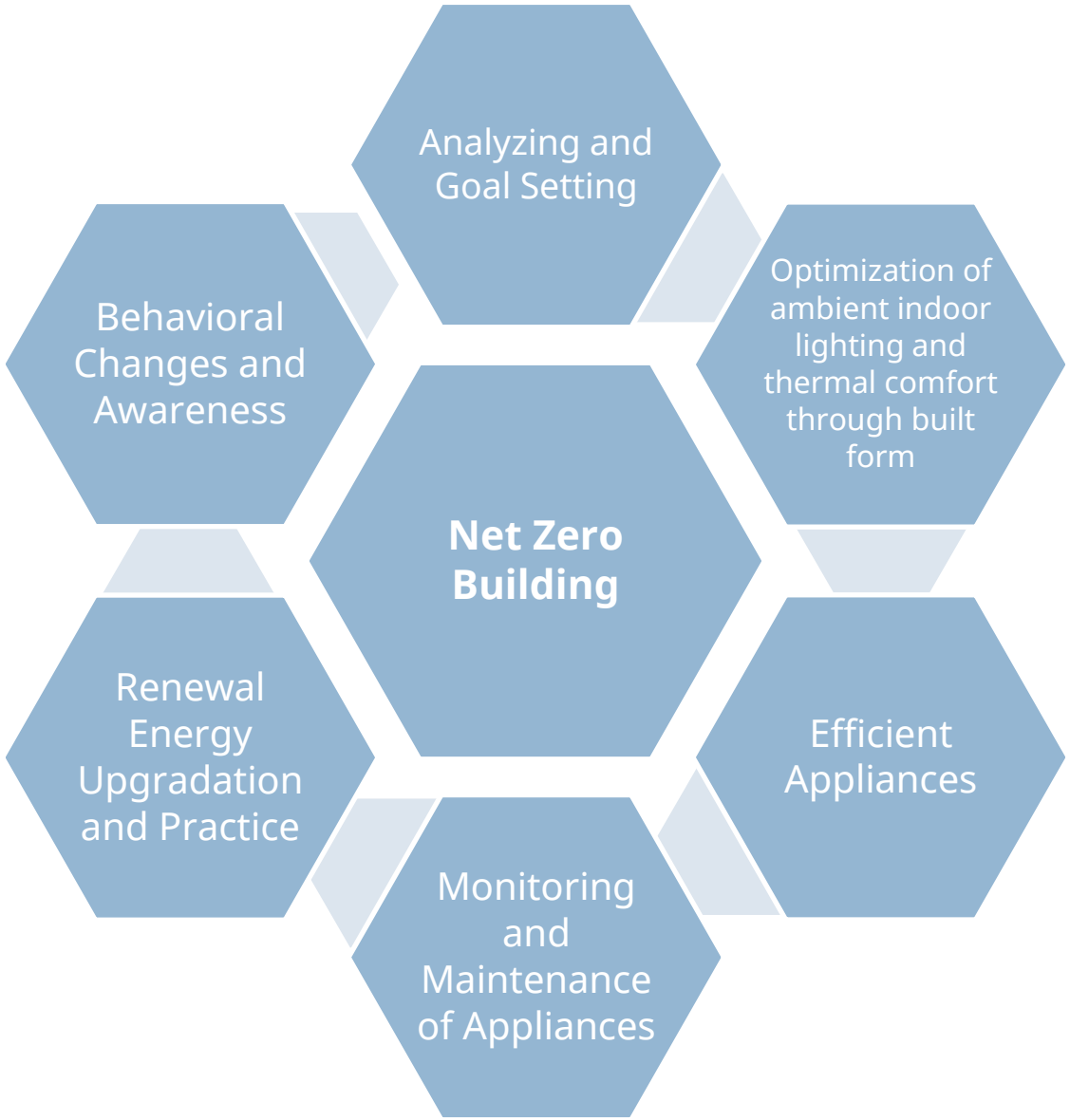
Aquacare Solutions
Enviro Engineers



Energy Efficient Practice and Consumption Plan

MANIPAL UNIVERSITY JAIPUR
(University under Section 2(f) of the UGC Act)

Energy Efficient Plan



PRACTISE AT MUJ

1. Conduct an Energy Audit.

2. Conscious built form

3. Application of efficient appliances

4. Regular maintenance of appliance.

5. Monthly monitoring of process and systems.

6. Annually analyze energy generation, consumption and future production

MANIPAL UNIVERSITY
JAIPUR
(University under Section 2(f) of the UGC Act)

RENEWABLE ENERGY UTLIZATION

Renewable energy Utilization is a key part of the design and development at Manipal University Jaipur. Hence, on site energy generation was given precedence to offset at least 50% of the total energy demand to achieve this solar p.v arrays are installed on the rooftops across all the major buildings in the University.

Key Performance Indicators:

The approach of MUJ to race towards self sufficiency in Energy is by reducing overall energy demand of MUJ (Admin & Academic-1) wherever possible. Design optimization was the key aspect which is driving MUJ to achieve energy use reduction. The reduced energy will be met by on site generated solar energy

- Climate responsive design of the building is the key element in the reduced energy demands.
- Appropriately sized systems with energy efficient technology & controls further reduced the energy demands
- Design has considered the orientation of building to construct the service structures on roof to reduce the amount of self shading & shadow patches on roof to maximum energy harvest with the solar pv's.
- Constant increase in capacity of solar PV system to steady offset of conventional energy demands

PRACTISE AT MUJ:

Available roof area is utilized for solar panels for high energy production to target NET Zero campus.

Parking shades are utilized for solar energy generation, efficiently utilizing space and getting benefitted for campus geographical location.

ENERGY AUDIT

PRACTISE AT MUJ:

INVENTUM POWER

Document ID: IPPL/EA/ND/19-20/01

ENERGY SAVING SUMMARY

S.No	Energy Conservation Projects	Annual Water Saving (KL)	Annual Energy Saving (KVAh)	Annual Monetary Saving in Lakhs	Investment (in lakhs) Rs.	Payback Period in Months	Co2 Emission Reduction in Ton	Page No
1	Avoiding use of transformer-1 during non-peak months		21,818	2.05	1.5	9	17.9	54
2	Maintaining 410-415 V instead of 430 V at Transformer-1		1,40,695	13.23	Nil	Immediate	115.4	55
3	Energy saving achieved by Chiller set point optimisation		13,745	1.29	Nil	Immediate	11.3	57
4	Energy saving by chiller plant optimisation		43,636	4.10	Nil	Immediate	35.8	59
5	Installation of Automation in Unitary AC		7,987.2	0.75	1.2	19	6.5	63
6	Replacement of Old AC by Inverter AC		3,840	0.36	1.2	40	3.1	63
7	Increase Re-use of Grey-Waste Water from laundry	4000		9.76	15.0	18	-	68
8	Energy saving by using fine bubble diffuser		44,460.6	4.26	5.0	14.2	36.5	71
9	Aggregation and optimisation of compressed air usage in STP		3,625.3	0.34	0.5	17.8	3.0	74
10	Installation of Energy efficient fans		2,40,000	22.56	90.0	48	196.8	79
11	Replacement of Inefficient Heat Pumps (Either by new heat pump or through staform hot water system)		49,332.8	5.1	7.8	18.5	40.5	81
12	Cleaning and Maintenance of Heat pumps to improve COP		39,926.3	3.8	6.0	19.2	32.7	83
13	Installation of Solar street light at peripheral roads		24,741.8	2.3	9.5	48.8	20.3	85
Total		**4000**	**6,33,809**	**70**	**138**	**24**	**520**	

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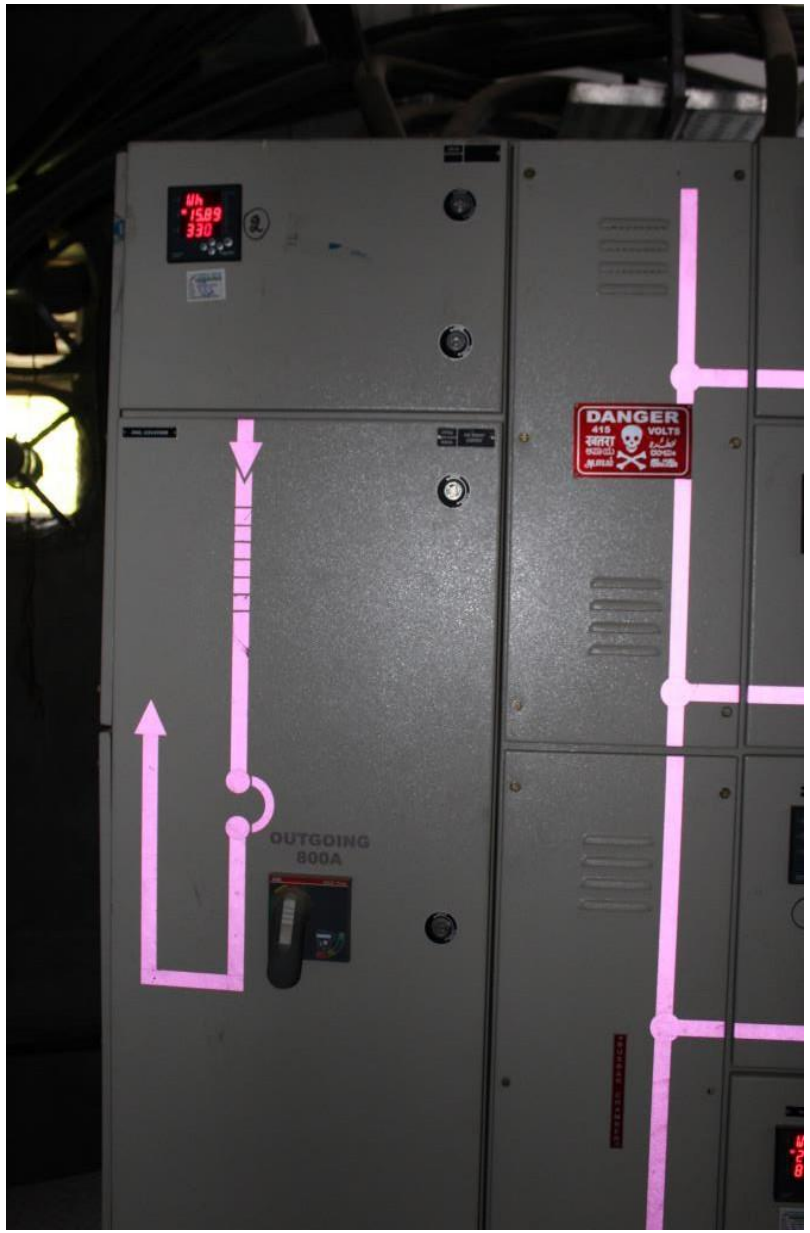
RESOURCE CONSUMPTION MONITORING



PRACTISE AT MUJ

•Resource consumption monitoring is a critical process that enables organizations to track, analyze, and manage the use of key resources like water, energy, and materials. The goal is to reduce waste, optimize efficiency, and promote sustainable practices.

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RENEWABLE ENERGY ANALYSIS

Months	Grid - MUJ Academic		Solar (Only MUJ)		Grid + Solar (Only MUJ)		Cost Per Unit
	1	2	3	4	5 = (1 + 3)	6 = (2 + 4)	
	Total MUJ kWh	Grid Amount	Total kWh	Solar Amount	Total kWh	Total Amount	
Apr-22	3,97,078	39,47,857	2,02,188	11,44,512	5,99,266	50,92,369	8.50
May-22	3,79,562	36,95,533	1,99,357	11,36,036	5,78,919	48,31,569	8.35
Jun-22	3,84,395	37,69,540	1,71,227	9,87,165	5,55,622	47,56,705	8.56
Jul-22	3,98,368	38,78,313	1,51,776	8,50,543	5,50,144	47,28,856	8.60
Aug-22	2,59,937	26,35,241	1,14,253	6,63,070	3,74,190	32,98,311	8.81
Sep-22	4,43,900	42,67,386	91,560	3,76,623	5,35,460	46,44,009	8.67
Oct-22	2,45,303	24,65,876	1,32,260	8,21,264	3,77,563	32,87,140	8.71
Nov-22	1,69,602	17,29,170	52,145	2,13,794	2,21,747	19,42,964	8.8
Dec-22	2,20,490	23,52,140	49,463	2,02,798	2,69,953	25,54,938	9.5
Jan-23	1,80,914	18,42,970	35,830	1,46,904	2,16,744	19,89,874	9.2
Feb-23	133236	1374783	46321	189919	179557	1564702	8.71
Mar-23	135208	1402323	145107	8,58,610.00	280315	2260933	8.1
Total	30,79,549	3,05,84,026	13,45,166	74,01,319	42,79,608	3,71,26,735	8.85
Avg Per Month	3,42,172	33,98,225	1,49,463	8,22,369	4,75,512	41,25,193	

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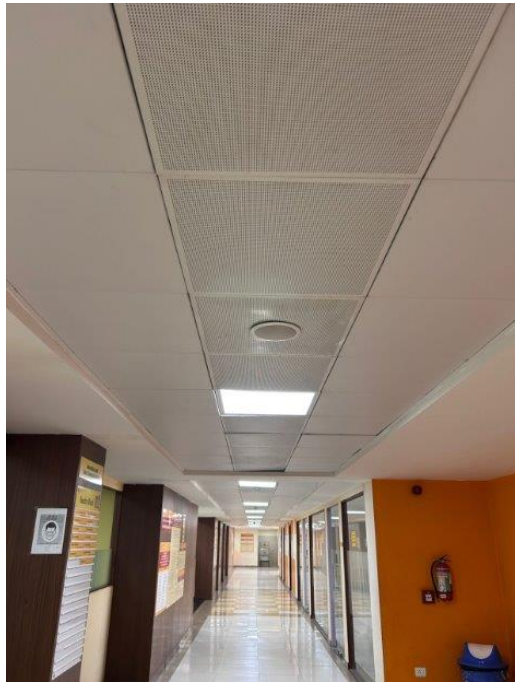
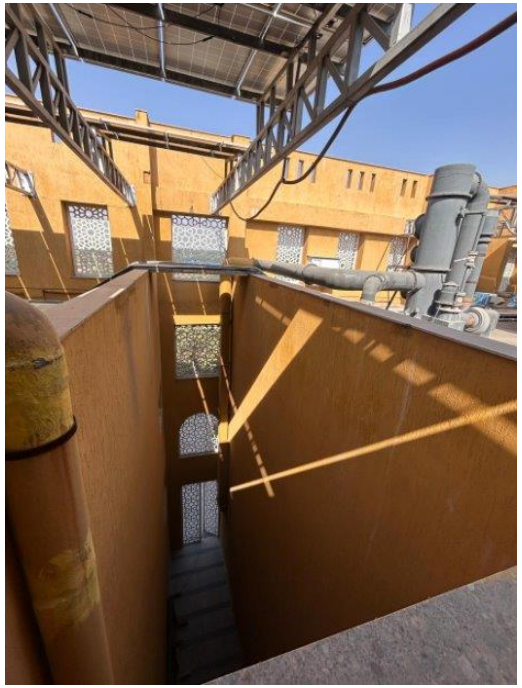
RENEWABLE ENERGY GENERATION

PRACTISE AT MUJ:





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RENEWABLE ENERGY SYSTEM MAINTENANCE

13 CLIMATE ACTION

PRACTISE AT MUJ: