

Energy and Diesel Generator Fuel Consumption Reduction Plan

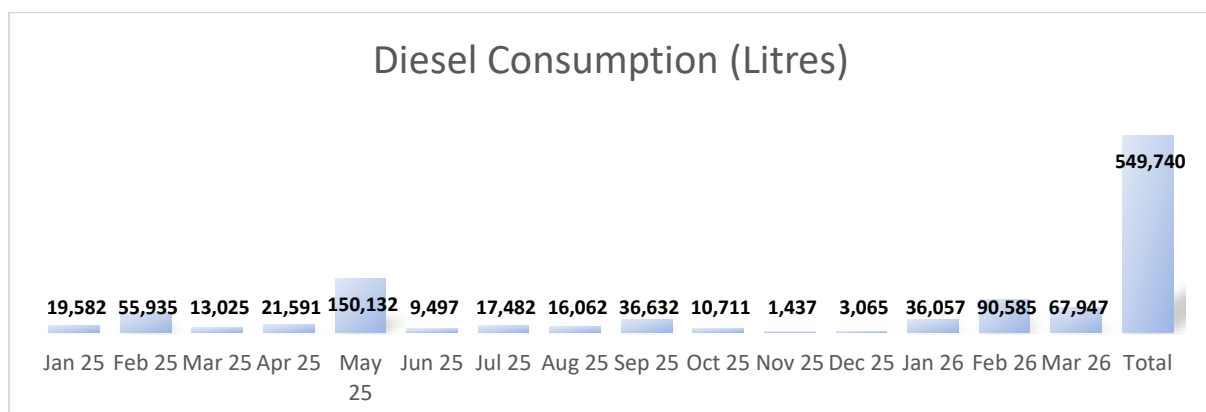
1. Objective

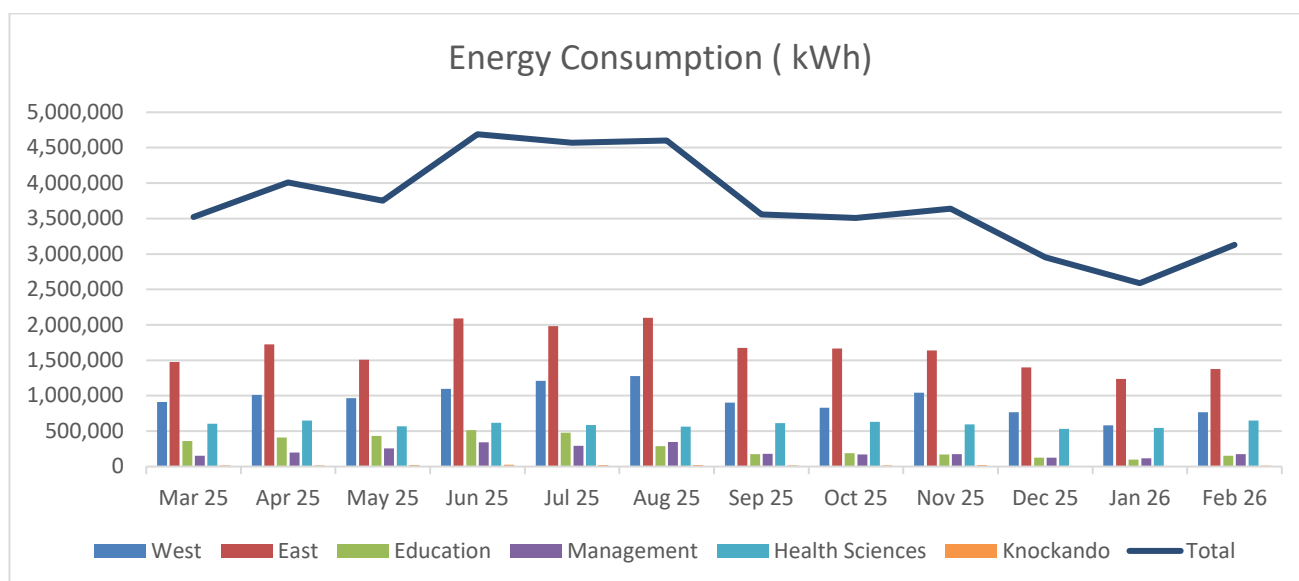
Our primary focus is to optimize diesel consumption and operating costs while ensuring that we maintain a highly reliable power supply that meets all our operational requirements. This effort not only helps in optimizing our resources but is also a significant step towards minimizing our environmental impact. In this regard, we are implementing several strategies and initiatives that are designed to enhance efficiency and sustainability across our processes

2. Baseline Assessment

OFMD plays a crucial role in ensuring the university's operations run smoothly, especially during times of planned and unexpected power outages. OFMD manages a fleet of more than 50 generators, each varying in size and make, purposefully operated to provide uninterrupted power supply and maintain the continuity of our university's operations. In our ongoing efforts to enhance efficiency and reliability, OFMD has conducted a thorough assessment of our past consumption patterns. This analysis is pivotal in establishing a reliable plan for future fuel use and generator management. Specifically, OFMD evaluated the total fuel consumption for the year 2025, which amounted to 355 151 litres. This figure serves as a critical baseline for our projections and planning for the year 2026. By using the 2025 consumption as a reference point, we aim to make informed decisions regarding any future changes and commitments.

In an effort to optimize diesel consumption, OFMD has implemented the following actions to assist in tracking diesel usage. These measures are designed to monitor consumption closely and enable timely interventions to ensure efficient use whenever necessary.





Actions:

- Record current fuel consumption (litres/hour or litres/day)
- Track generator load (% of capacity)
- Measure runtime hours per day/week
- Identify peak vs off-peak usage
- Check maintenance history

Key Output:

- Fuel consumption benchmark (e.g., 178 L/hour at 70% load)

3. Load Optimization

Problem:

Generators consume more fuel when:

- Running at low load (<30%)
- Overloaded (>80–90%)

Solutions:

- Operate generators at **optimal load (60–80%)**
- Consolidate loads onto fewer generators
- Turn off unnecessary equipment during generator use
- Schedule high-load activities efficiently

Impact:

Up to 5% fuel savings (optimized)

4. Preventive Maintenance Program

OFMD has recently appointed two service providers to deliver preventative and corrective maintenance services for our standby generators. This initiative aims to enhance efficiency and optimize generator performance, ensuring they operate at optimal levels and reduce fuel consumption

Key Maintenance Tasks:

- Clean/replace air filters regularly
- Replace fuel filters
- Check injectors and fuel pumps
- Maintain correct oil levels and quality
- Inspect cooling system

Frequency:

- Monthly checks
- Weekly inspections
- Scheduled servicing (based on hours)

Impact:

1–5% fuel efficiency improvement

5. Smart Monitoring & Automation

OFMD has upgraded majority of the controllers for the generators to enhance visibility and enable remote management. This improvement will help us monitor and control the generators more efficiently

- Fuel monitoring systems (real-time tracking)
- Load monitoring meters
- Automatic generator controllers (AMF panels)

Benefits:

- Detect fuel theft leaks or wastage
- Optimize runtime
- Improve decision-making

6. Energy Efficiency Measures (Demand Reduction)

The university is currently finalizing the energy performance certification project. This initiative aims to establish a consumption baseline for each building and ensures that energy-saving measures are effectively

developed based on this data. Some of the energy-saving initiatives currently underway include the following:

- Optimize BMS system
- Schedule HVAC operations
- Optimize space heating

Impact:

1–5% reduction in generator demand

7. Hybrid Power Integration

Grid, PV and generator integration is not only pivotal in advancing our sustainability goals, but it also plays a critical role in peak shaving. By integrating the PV plant into our operations, the university has made substantial progress in reducing our reliance on City Power, which aligns with our commitment to more sustainable and efficient energy usage.

The technology we are utilizing involves photovoltaic systems that harness solar energy, thereby allowing us to lower our operational costs significantly. The total installed PV capacity is currently around 2.2 MWp. This substantial capacity helps us mitigate the effects of energy demand spikes and provides a more stable, reliable power source. As the university continues to monitor and optimize this system, we anticipate further benefits not only in cost savings but also in reducing our environmental impact.

Combine Generator with:

- Solar PV systems
- Battery storage (ESS)

Strategy:

- Use solar during daytime to supplement our energy needs
- Run generator only when necessary

Impact:

1–5% diesel reduction (site dependent)

8. Operational Scheduling

OFMD has removed most heating circuits from the generator circuits to prevent heaters from running when on generators. Timers have been installed to manage heater operating times effectively. Additionally, OFMD has issued HVAC installation guidelines, restricting them to lecture and meeting rooms, not offices.

Actions:

- Avoid unnecessary generator runtime
- Implement shutdown policies during low and high demand
- Schedule heavy equipment usage times

9. Cost-Benefit Analysis

Initiative	Cost	Savings	Payback
Maintenance improvements	Low	Medium	Short
Load optimization	Low	High	Immediate
Monitoring system	Medium	Medium	3–6 months
Solar hybrid system	High	Very High	1–3 years

10. Implementation Roadmap

Phase 1 (Within 6 Months)

- Baseline assessment
- Generator maintenance improvements
- Load optimization and reduction

Phase 2 (7 – 12 Months)

- Improve BMS monitoring system for HVAC
- Improve operational scheduling of HVAC
- PV generator integration

Phase 3 (12 – 24 Months)

- Roll out 780 kW of PV

11. Expected Results and Targets for 2026

- **Fuel savings:** 1 – 5%
- **Energy savings:** 1 – 5 %
- **Reduced maintenance costs**
- **Lower emissions**

12. Summary

As part of our ongoing efforts to promote environmental responsibility, the university is rolling out a series of energy and diesel consumption reduction initiatives. These initiatives are carefully designed to align with our sustainability

goals and ensure that we are utilizing our resources as efficiently as possible. The primary focus of these efforts is to reduce our overall energy usage and minimize diesel consumption across campus. This will involve a combination of strategies, including the implementation of energy-efficient technologies, the adoption of best practices for resource management, and encouraging all members of our community to be mindful of their energy consumption habits.

The most effective quick wins are:

1. Load optimization
2. Preventive maintenance of generators
3. BMS optimization
4. Eliminating idle running
5. Smart monitoring

The biggest long-term savings come from:

- Hybrid solar systems roll out