

# Internal Energy Audit Report: Out-of-Hours Energy Use

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## Executive Summary

This audit identifies over 107 kWh of energy wasted each night across campus due to equipment being left on unnecessarily. If this pattern continues, this equates to approximately 26,880 kWh per year and around 5.57 tonnes of CO<sub>2</sub>e emissions.

The findings show that this energy waste is driven primarily by everyday behaviours rather than technical limitations. This means that significant reductions can be achieved quickly and at low cost through simple actions by staff and students.

Reducing out-of-hours energy use represents a clear opportunity to lower emissions, cut costs, and support Edge Hill University's sustainability commitments.

## Purpose

This audit investigates avoidable energy consumption across Edge Hill University (EHU) during out-of-hours periods. Through a series of targeted evening audits, it identifies where energy is being used unnecessarily and quantifies the scale of this waste.

The findings highlight a clear opportunity: simple, immediate actions can deliver meaningful reductions in both carbon emissions and energy costs.

## Methodology

### Audit Approach

Evening walkthrough audits were conducted across a representative range of academic and administrative buildings. These inspections captured a snapshot of energy use after the campus day had ended, focusing on equipment that remained powered on without operational need.

Audits were conducted by the Corporate Sustainability Manager and Sustainability Officer.

### Scope

The audit covered the following device types:

- Desktop computers
- Computer monitors
- Ceiling lighting (mixed LED and non-LED systems)
- Desk lamps

## Assumptions for Energy Estimation

Energy consumption estimates were derived using standardised power ratings for typical office equipment, informed by published data and manufacturer specifications.

Monitors were assumed to consume 35W for 6 hours and 0.5W for 6 hours, based on typical usage patterns and manufacturer data (HP QuickSpecs, n.d.). Desktop computers were assumed at 180W for 12 hours, reflecting the specifications of commonly deployed machines across the University (HP, 2024).

Lighting energy use was modelled at 60W per ceiling fitting, reflecting a blended estate of LED and fluorescent systems. Desk lamps were estimated at 7.5W, consistent with modern low-energy task lighting (naviTEC, n.d.).

Unlike simple constant-load assumptions, this audit accounts for both active and standby energy use, providing a more realistic estimate of overnight energy consumption.

These values represent conservative assumptions and align with standard energy auditing methodologies where direct metering is not available.

## Limitations of the Audit

There are several factors to consider when interpreting the findings:

- The audit represents a single snapshot in time, as buildings were visited once due to time constraints.
- Public access devices (e.g. computers in Catalyst learning spaces) were excluded as they remain intentionally available for student use.
- Some areas could not be accessed due to security restrictions, meaning not all spaces were included.

As a result, the findings should be considered indicative and may underrepresent total out-of-hours energy use.

## Key Findings

### What We Found

A consistent pattern of unnecessary energy use was identified across campus. Monitors, computers and lighting are frequently left on overnight, resulting in avoidable energy consumption.

## Estimated Energy Waste per Night

Based on the assumption that most devices found on, would be left on for a twelve-hour period, energy consumption for each night was calculated using the following equation:

$$\text{Energy (kWh)} = \frac{\text{Power (W)} \times \text{Time (hours)}}{1000}$$

Monitors were modelled using a split assumption (6 hours active / 6 hours standby), reflecting realistic device behaviour.

Building	Estimated kWh/night
FoE Piazza	3.09
FoE Lakeside	12.48
FHSCM	22.71
CSSC	0.85
Law & Psychology	19.56
GeoSciences	1.36
BioSciences	0.85
Tech Hub	12.34
Wilson Centre	15.52
Business School	8.82
Main Building	0.93
Arts Centre	2.51
Creative Edge	4.21
Catalyst	2.37

## Total Estimated Wasted Energy

It is estimated that on the basis of the audit findings that EHU is wasting 107.61 kWh per night. This represents a substantial volume of energy use with no operational benefit.

## Why This Matters

When projected across a typical working year, this level of waste becomes highly significant. The current pattern equates to approximately 26,903 kWh of energy wasted annually, resulting in an estimated 5.57 tonnes of CO<sub>2</sub>e emissions.

To put this into context, this is roughly equivalent to powering around 9–10 UK homes for a year or driving nearly 20,000 miles in a typical petrol car. This highlights how small daily behaviours can quickly add up to a significant environmental impact.

This level of impact is entirely avoidable and results from small, repeated behaviours across campus. Although each instance may seem minor, together they create a significant environmental and financial cost.

## What's Driving the Issue

The audit highlights a number of key patterns. A relatively small number of buildings contribute a disproportionately large share of energy waste, meaning that targeted interventions could have a strong impact.

Monitors represent the most common source of overnight energy use. While they individually consume modest amounts of electricity, their widespread use leads to a significant cumulative effect. Lighting also contributes a consistent baseline of waste, particularly in shared spaces.

Crucially, the issue is behavioural rather than technical. Devices are being left on due to routine habits, unclear responsibility, or lack of awareness rather than system failures.

This is significant, as it means the issue can be addressed quickly and cost-effectively without the need for major capital investment.

## How We Can Fix This

Reducing overnight energy use will require a combination of behaviour change and improved operational controls.

At an individual level, simple actions can make a significant difference. Switching off monitors, shutting down computers where appropriate, and turning off lights when leaving a space can collectively reduce energy waste across campus. Creating a shared culture of responsibility - where staff and students encourage each other to adopt these behaviours - will be key to success.

What you can do today:

- Switch off monitors when leaving
- Shut down computers where practical
- Turn off lights in empty rooms
- Log out of shared devices
- Report issues via InvidaResolve

From an operational perspective, implementing automatic power management settings, expanding occupancy-based lighting controls, and delivering targeted engagement campaigns will reinforce these behaviours.

Providing feedback on performance will also help make energy use more visible and encourage sustained engagement.

## Monitoring and Continuous Improvement

Maintaining progress will require ongoing monitoring and review. Repeating this audit on a four-year cycle, alongside periodic spot checks, will ensure continued visibility and accountability against the baseline data presented here of 26,880 kWh of energy wasted annually due to devices covered in this audit being left on overnight.

Integrating findings into wider sustainability reporting will help track progress and ensure alignment with institutional objectives.

## Conclusion

This audit shows that more than 100 kWh of energy is wasted every night across the University estate. While significant, this is also one of the most accessible opportunities for improvement.

The key message is simple:

- The problem is behavioural
- The solution is straightforward
- The impact is immediate

By improving awareness, strengthening responsibility, and supporting behaviour change, EHU can meaningfully reduce energy use, cut emissions, and enhance its sustainability performance.

# Appendices

## Appendix A: Summary of Devices Left On

Building	Devices Left On
FoE Piazza	1 computer, 1 light, 1 monitor
FoE Lakeside	21 monitors, 5 lights, 1 desk lamp, 2 computers
FHSCM	39 monitors, 8 lights, 4 computers
CSSC	4 monitors
Law and Psychology	6 computers, 31 monitors
GeoSciences	3 monitors, 1 light
BioSciences	4 monitors
Tech Hub	14 monitors, 4 computers, 1 light
Wilson Centre	6 lights, 12 monitors, 4 computers
Business School	3 lights, 11 monitors, 2 computers
Main Building	2 monitors
Arts Centre	2 lights, 4 monitors
Creative Edge	13 monitors, 2 lights
Catalyst	1 monitor, 1 computer

## References

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