CASE STUDY

Student Accommodation

The problem

Empiric Student Properties (ESP) are a leading provider and operator of prime city centre located student accommodation in university towns and cities in the UK.

This project involved the upgrade of four existing student accommodation blocks in central Edinburgh.

The priorities for this project were;

IMPROVING ENERGY EFFICIENCY & COMFORT

IUsing all electric heating can be expensive unless it is properly controlled. The client wanted a system to provide centralised control across the buildings to manage set points and prevent excessive energy consumption, and to give occupants a simple way to engage with the system to increase temperatures and improve comfort.

METERING ENERGY USE

The client wanted a detailed understanding of energy use across the buildings, there were a number of drivers for this including:

- **Understanding the breakdown of energy by end use to inform future developments**
- **Allowing energy data to be communicated to occupants to encourage behaviours which would reduce consumption**
- **To identify unusual patterns of energy use which may be used to identify problems or optimise the building performance.**

AT A GLANCE

Location	Edinburgh
Project Description	Metering and automation of existing student accommodation buildings
atBOS Control Apps	Metering, Heating, Lighting, Ventilation
atBOS Cloud Apps	Analysis, Alerts, Responses, MessageMe
Mechanical systems	Panel Heaters Non-dimmable lighting Mechanical extract ventilation

MAINTENANCE & OPERATIONS

Minimising maintenance call outs was a key driver to reduce running costs. The management team raise tickets with a separate maintenance team. Providing alerts of potential issues to the management team to investigate and take action early and plan maintenance effectively.

Further requirements related to the protection of building fabric such as:

- **Ensuring humidity levels do not lead to mould growth**
- **Monitoring water consumption to highlight potential leaks**
- **Remote shut off of water supplies in the event of a leak**

The buildings containing a total of 60 studio rooms are classic tenement buildings, studios were located over levels 2, 3 and 4 with retail units on the lower floors. The proposed servicing strategy for the building involves electric heating panels, electric point of use, water heaters for washbasins and sinks and electric showers. A centralised ventilation system extracts air from ensuites and each studio has an extract fan to provide the air extraction required for the kitchens.

The Atamate Solution

To address the requirements of the brief outlined above Atamate installed the following components in each studio:

- **Sensor Unit**
- **Relay Unit**
- **Metering unit**

The Sensor Unit monitors environmental parameters in a room along with occupancy, it has two relays which were used to provide a master override switch to the lighting and a water solenoid shut off.

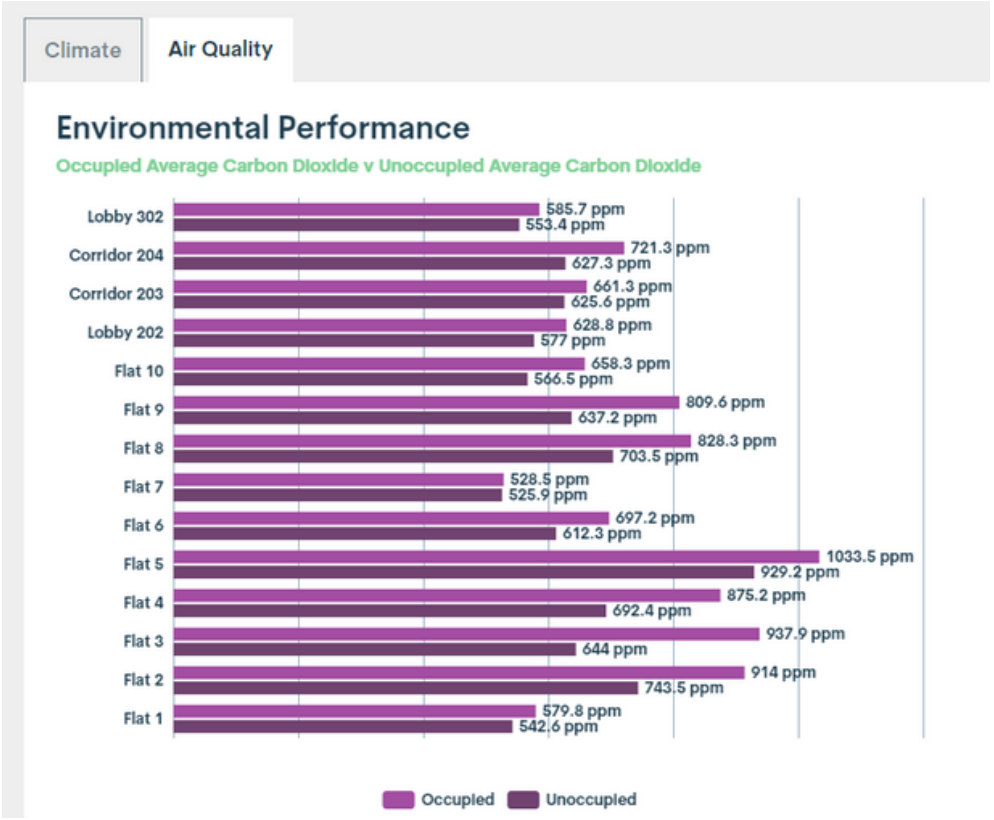

Figure 1.Monitor the IAQ of rooms when occupied vs unoccupied using CO2 as a measure of healthy indoor air quality

The Relay Unit has two relays which are used to control the room heater and kitchen extract fan. This unit also includes a connection to a heating boost button and a remote sensor used to monitor air flow from the kitchen fan.

A Metering Unit can monitor 8 individual electrical circuits. This unit was installed in the consumer unit to each studio and monitors the main incoming supply and 7 sub-circuits including, space heating, hot water, lighting, cooking and socket outlets.

IMPROVING EFFICIENCY & COMFORT

The inclusion of a Sensor Unit in every studio allows the ESP maintenance and management teams to view the following parameters in real time or retrospectively:

- Temperature
- Carbon dioxide concentration
- Relative humidity
- Volatile Organic Compounds (VOCs) concentration
- Ambient light
- Occupancy.

atBOS controls the temperature in each room based on a predetermined set point, but each room has a Boost button installed.
Heating in each room is automated by the Atamate system, this allows central definition of set points.

There are two set points for the studios, one for when they are occupied and a second for when they are unoccupied. This allows the temperature to be set back when spaces are empty to save energy. The fast response of electrical heaters means that rooms rapidly rise to temperature when an occupant returns.

Figure 2. atBOS Metering gives granular usage data on individual circuits for an individual flat or across the whole building

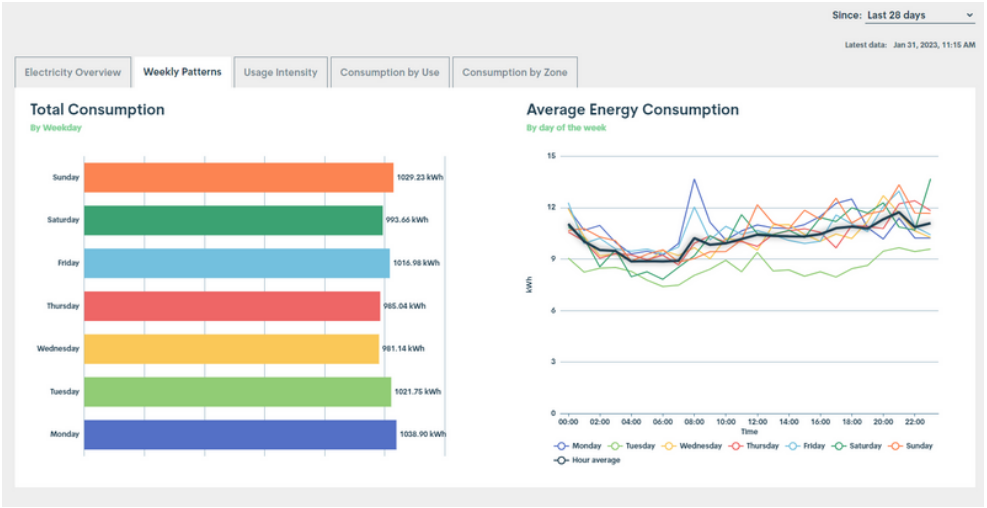

Figure 3. Average patterns of energy use can be viewed on a daily, weekly or monthly basis and as a total used

To provide additional control for users, a Boost button is installed in each room. When this is pressed it lifts the set point for a period of time, these parameters are both defined by the building manager. Over time the system will be used to optimise set points to reduce set points as far as possible whilst preventing excessive use of the boost buttons. This will lead to balance between reducing energy consumption and appropriate levels of comfort.

The sensor network uploads its data to the cloud where ESP teams can access it in real time or retrospectively, confirming the client's commitments to thermal comfort and high indoor air quality.

DATA COLLECTION

Data is collected by the the Atamate system from every connected device including indoor environmental quality, occupancy, energy consumption, heater operation and fan operation. This is presented to the client team through a cloud based app, Atamate Analysis.

This allows actionable insights to be derived from a range of processed data including:

- Total electricity consumption across the site
- Electricity consumption by end use for each studio
- Water consumption
- Occupancy data
- Air quality data
- Heater operation
- Ventilation operation.

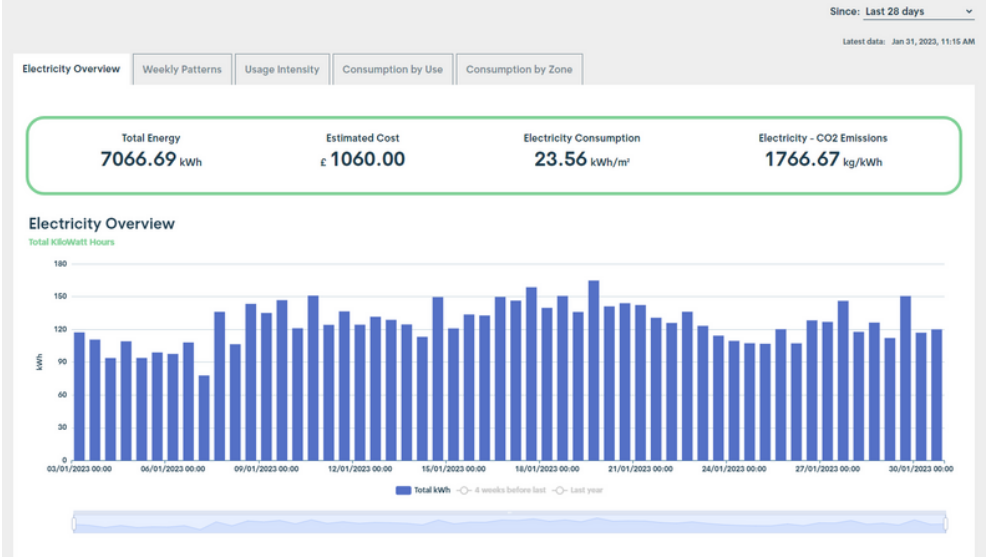

Figure 4. atBOS provides a simple dashboard that at a glance shows key energy KPIs for a building

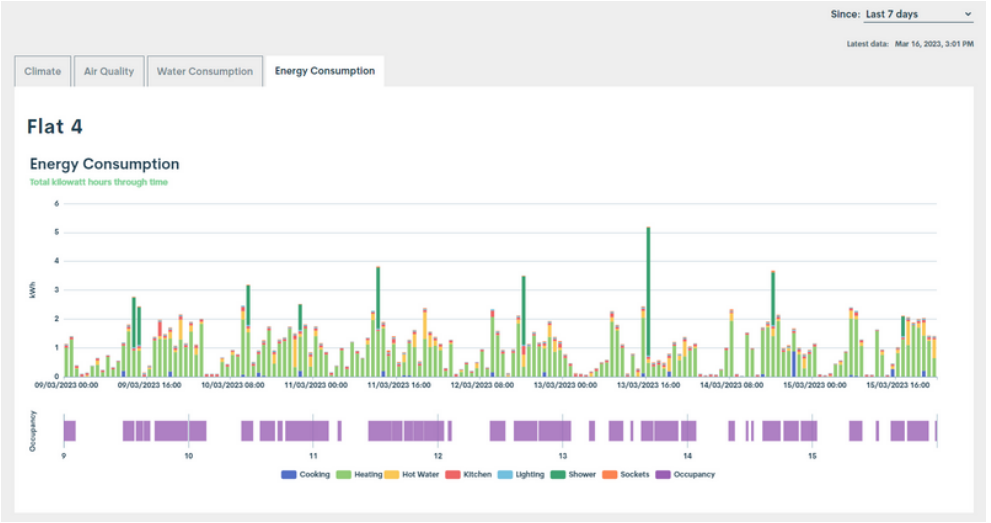

Figure 5. For more detailed analysis, energy usage data can be seen against occupancy and time

ALERT MONITORING

ESP maintenance and management teams can access the data described above to take action where necessary to optimise the running of the building.

In addition to this the Atamate Alert Monitoring cloud app is continuously analysing this data to highlight potential faults.

Checks include:

- **Anomalous increases in energy use**
- **Excessive water consumption pointing to potential leaks**
- **Enabling heaters results in no power draw or change in temperature indicating potential failure**
- **Enabling fan results in no change in pressure indicating potential failure**

The system also picks up direct alerts from items of central plant such as fans and water boosters.

These alerts can be categorised into degrees of severity and then the app Message Me can send reports to nominated personnel via email or text message. It is also possible for alerts to be raised directly as tickets in a maintenance database (CAFM system) where a suitable API exists.

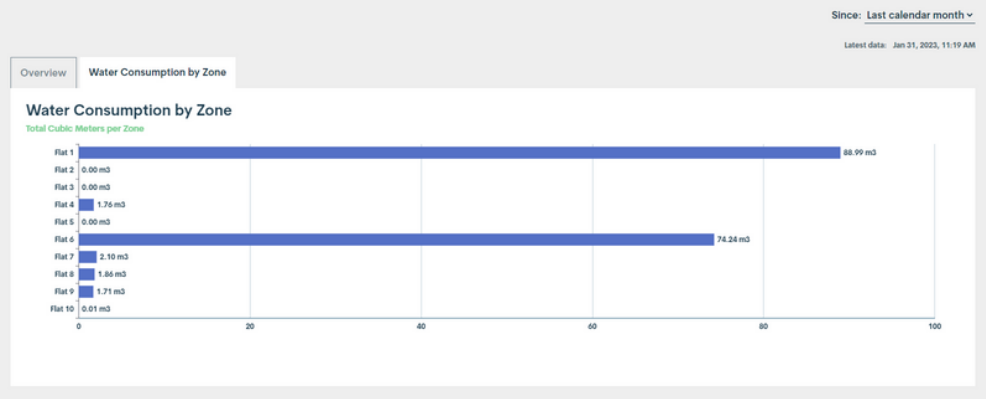

Figure 6. Identifying and preventing water leaks using water consumption data

Figure 7. Simple and easy to use Alerts can be set up and used when the atBOS system detects anomalies

For more information or to get in touch about this project, please call 01865 920101 or email us on info@atamate.com