

Automated Metering

In 2009, GE Capital Real Estate trialled an automated utility meter reading system at its then London head office, achieving savings in the first year of over £57,000. Following the success of this trial, the company has started to roll out the scheme across 20 of its multi-occupied office buildings.

> Situation

GE Capital Real Estate is committed to achieving lasting reductions in the environmental footprint of its buildings. The company believes that engaging with occupiers on sustainability can create competitive advantages by improving occupier satisfaction, retention and leasing, not to mention preserving long-term asset value.

GE Capital Real Estate saw the introduction of automated meter reading (AMR) systems as key to its commitment to reduce energy consumption, given that sustained reductions are heavily dependent upon behavioural change which, in turn, is dependent upon information.

Another driver was that it would help the company to prepare for the Government's new CRC Energy Efficiency Scheme. GE Capital Real Estate piloted its new AMR system and remote monitoring process at its then London head office in Berkeley Square. This 50,000 sq ft building was home to various GE Capital businesses, accommodating around 350 staff in air conditioned, mainly open plan offices, with operating hours typically running from 7am to 7pm.

> Actions

GE Capital Real Estate chose to install an AMR system for the main electricity, gas and water meters. This solution, which provides half-hourly consumption data at a whole building level, offered the greatest value in terms of implementation costs and projected energy savings, as well as being the easiest option to roll out across their portfolio. It also offered the capacity to link the building's sub-meters to the system at a later date.

They contracted out ongoing remote energy monitoring services to an external consultancy, WSP. This removed the need for an in-house energy specialist in each building.

They used a three step process to introduce AMR metering. For instance, at Berkeley Square:

1. Equipment and Services

- The main electricity meter already provided half-hourly consumption data via a telephone line to the utility supplier; WSP dialled into this data feed.
- The gas meter had a dial display that needed to be read manually but, like many modern gas meters, also had pulsed output capability. A simple wired connection was added from the pulsed output to a small data logger and communication device to send half-hourly gas data to WSP.
- A similar approach was applied for water metering.

2. Analyse and Improve

- After the initial installation, WSP analysed actual consumption profiles remotely and set out, in a report, observations on anomalies and recommendations for operational improvements.
- The on-site building management team then acted to address anomalies and implement recommendations, for instance by making operational adjustments to the Building Management System (BMS) to rectify unnecessary out-of-hours consumption.

3. Maintain and Manage

- WSP continues to supply half-hourly electricity, gas and water data to building managers on a day-plus-one basis, via a dedicated online dashboard, together with alarms, reporting and management tools.
- Alarms inform building managers when consumption exceeds certain building-specific thresholds.
- Building managers use this information to ensure efficient management of the building and avoid 'drift' in operational performance.

GE Capital Real Estate is now rolling out this low-cost technology across 20 multi-occupied office buildings.



30 Berkeley Square

"This is a very basic and cost-effective tool for improvement and ongoing management of utilities in buildings. It gives visibility, motivation and recommendations. It proved itself so quickly we are now rolling it out in all our buildings with significant consumption."

David Short, Director of Environment and Sustainability at GE Capital Real Estate Europe

Challenges

Visibility

How to make building managers aware of the building's consumption of electricity, gas and water at different times of the day to identify opportunities to make energy savings?

Half-hourly consumption profiles gave building managers insights into how the building performed during the day and overnight. This helped them to optimise operating hours for lighting, heating and cooling, particularly addressing high base-loads and out-of-hours spikes in consumption.

Comfort

How to reduce plant operating times and 'warm-up' periods of the building, without impacting employee comfort or safety?

Significant reductions in utility usage were achieved, mainly by ensuring equipment was not operating when people were not in the building. There was no discernable impact on employee comfort or safety, and no complaints.

Motivation

How to motivate facilities management staff and other employees to change behaviour to save energy?

The analysis provided through the remote monitoring process shows people that, if changes are made, a defined amount of money and CO₂ emissions will be saved, and confirms those savings once changes are made. This clearly shows people the benefits of their efficiency improvements.

Technical and operations

How to realise the potential savings highlighted by the remote analysis report and energy management tools?

The Berkeley Square building benefited from a committed on-site building management team and contractors who, with the help of WSP, took forward the recommendations and made changes to the building controls to achieve real savings.

Achievements

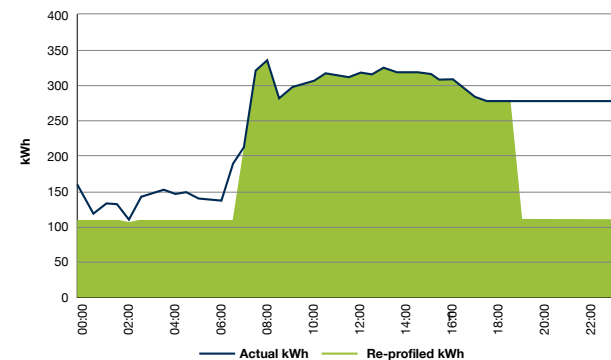
Benefits

The installation of the AMR system and remote monitoring process led to the fine tuning of BMS settings and changes to out-of-hours boiler controls, as well as the installation of waterless urinals to avoid constant flushing night and day.

For instance, the pilot at Berkeley Square has led to:

- 16% less electricity use, cutting annual CO₂ emissions by 159 tonnes per year
- 42% less gas use, cutting annual CO₂ emissions by 105 tonnes per year
- 74% less water use, saving 5.2 million litres of water per year.

GE Capital Real Estate is now rolling out similar systems across 20 of its multi-occupied office buildings, with typical reductions of 3 - 20% in each building, and in some cases much more.



Typical electricity load reprofiling over 24hrs demonstrating the savings achieved by ensuring systems run in line with the core business occupancy hours. Data compares measured electricity consumption before (actual) and after (re-profiled) making changes.

Financials

At Berkeley Square, the payback once recommendations were implemented was less than two months, with an initial investment of £6,050 and savings in the first year of more than £57,000.

Capital investment

- £1,500 to install the AMR system
- £4,000 for waterless urinal installation and BMS programming
- £550 for remote analysis report.

Annual reductions

- £29,600 electricity cost savings
- £19,800 gas cost savings
- £8,300 water cost savings.

A Better Buildings Partnership case study from: **GE Capital Real Estate**

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