

Winner case study

Demand Logic, London



Joe Short, CEO, Demand Logic.



Heating plant monitored by Demand Logic.

2015 Impax Ashden Award for Energy Innovation

Award supported by



230,000m²
floorspace being monitored



2,750 tonnes
of CO₂ saved per year



£500,000
being saved annually by
Demand Logic clients

“Demand Logic’s innovative approach to making sense of the masses of environmental data available for modern buildings is dramatically cutting energy bills for their impressive list of clients. It’s a fantastic example of the huge potential of the green economy.”

Ashden judging panel

Drowning in data

Most modern and refurbished commercial and public buildings have complex systems to provide heating, cooling, ventilation and lighting services, overseen by a computer-controlled Building Management System (BMS). Using a BMS makes it possible to manage energy use more effectively, but due to their complexity, many are not set up correctly, causing energy wastage. Energy is also wasted when people adjust controls without fully understanding them, and when undetected equipment failures occur. The result is higher energy bills, higher CO₂ emissions and reduced comfort.

The BMS collects all the raw data that would be needed to track down these problems. The problem is, there’s simply too much of it to be analysed manually, so much of the potential

“The speed of deployment on one of our sites was overnight. Compared to other providers, the system is simple, effective and straightforward and it makes both us and our tenants feel more comfortable that our building systems are being run properly.”

Charlie Railton, Senior Engineer, Land Securities

value of the data is wasted.

The solution

In 2013 Demand Logic launched its system to make sense of the vast quantity of data produced by a BMS. A device is installed alongside the BMS to stream data from it about the building and services. This data is uploaded to Demand Logic’s cloud server, where its software processes and analyses it, producing graphical representations of the building’s energy use. The building manager can then see at a glance when heating and cooling systems are running outside normal working hours,

when rooms are not being maintained at the correct temperature and much more. Action can then be taken to eliminate energy wastage.

Why they won

Demand Logic’s system can bring lower energy bills for tenants, while landlords can track down malfunctioning equipment quickly, saving money on maintenance work. The system is also beneficial for building developers, as it can be used during the commissioning of a building to check that equipment has been correctly installed and configured. Following that, it can be used as part of the building handover, demonstrating to the owner how the building systems are working and tracking down any snags to be fixed.

Demand Logic’s system is unique in the UK – no competitor offers compatibility with a wide range of BMS models, quick installation and in-depth analysis of the data that is captured. The company has been growing quickly in the past year, and is already exploring opportunities in the USA, where it is gaining sales despite tougher competition.

Business model

Demand Logic offers its system as ‘software as a service’ – clients pay an installation fee and an annual charge, which includes a basic level of consultancy to support them. Further consultancy can be purchased if the client wants additional technical assistance to deal with the issues the Demand Logic system is highlighting to them. The fees charged vary in proportion to the size of the building being monitored, and are set at a level such that all clients can make savings on their energy bills that are considerably greater than the cost of using Demand Logic. Although the biggest savings are made in the first year, when major errors are corrected, clients continue their subscriptions after this to avoid slipping back into wasting energy.

System operation

Installation

The Demand Logic hardware can be installed in a few hours, after which all operations can be carried out remotely. Once installed, the system starts ‘learning’ about the BMS it is connected to, interpreting the names of the streams of data it is receiving, and speeding up the setup process – it is usually completed by the morning after the installation. Demand Logic’s system works with the majority of existing and new BMS installations; it supports the BACnet communications protocol that many BMS vendors use, and also the proprietary protocol used by Trend BMS. Security is important, and clients’ data is uploaded to Demand Logic’s cloud server via an encrypted connection, either using a network present in the building or the mobile phone network.

Data analysis and presentation

Demand Logic’s software processes the data coming in from the BMS and turns it into graphical representations that are easy to understand (see right). For example, the ‘major plant watchdog’ shows when plant like large boilers or chillers is running outside of normal working hours, while the ‘rogue finder’ identifies rooms where energy use for heating or cooling is high and where the temperature is not close to the desired level. The graphical representations of data, displayed in a web browser, make it easy to spot problems and enable the user to click on the identified rooms or plant items to see more details and determine what action to take. Virtual meters can also be created, for example showing an estimate of energy used by all ventilation fans, or by cooling on a specific floor of a building.

Achievements

Demand Logic systems are currently installed at 26 sites, with a total floor area of about 230,000 m². In March 2015 the actions already taken by clients to tackle problems identified by Demand Logic were saving about 2.8 GWh of electricity and 6.3 GWh of gas annually, avoiding about 2,750 tonnes of CO₂ emissions annually. Potential actions which had been identified but not yet acted on were expected to boost these annual savings to 7.6 GWh of electricity and 17 GWh of gas, which would avoid about 7,450 tonnes of CO₂ emissions. Demand Logic clients can usually expect to save at least 10% on their energy bills.

Future plans

Demand Logic expects its role in commissioning buildings to grow, in addition to continuing installations in existing buildings, increasingly with large landlords like Land Securities and BMS specialists like Chartwell. Demand Logic is also involved in research funded by the government’s Innovate UK programme, investigating using its system to provide demand response services, by switching off plant when national electricity demand is high, and earning money for clients in return.

Disclaimer

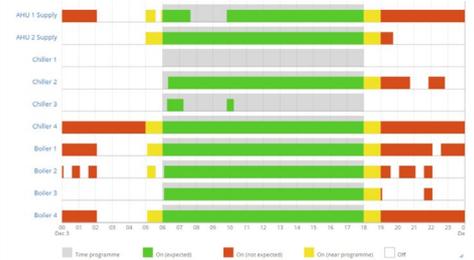
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Messaging and monitoring

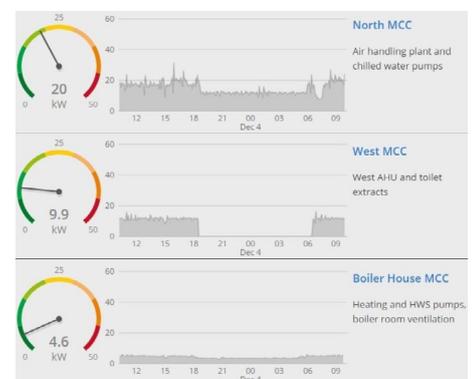
To help clients keep track of problems in their buildings, Demand Logic has created a social media-style messaging system, with discussion threads linked to specific items of equipment or problems. This allows a history to be built up, which is useful if a problem recurs. The same system is used to track opportunities to save energy, which Demand Logic identifies and marks as ‘suggested actions’ or ‘action required’, depending on the severity of the problem and the likelihood of making an energy saving. Actions are then marked as ‘in progress’ and then ‘completed’, allowing Demand Logic and the client to keep track of the savings that are being made.

“In five years’ time I want to look out over the London skyline and be able to point in any direction and say we have reduced massively the energy wastage in that building and that building - and that’s enough to turn off an entire power station. The magnitude of savings possible is staggering.”

Joe Short, CEO, Demand Logic



Major plant watchdog highlights plant running outside of normal working hours.



Virtual meters allow energy use for specific types of plant or areas of a building to be monitored without installing extra hardware.