iSERVcmb Best Practice

Electricity savings of 19% per year through better control of services and optimised control of Chiller sequencing.

Office Block

Freshfields Bruckhaus Deringer LLP, UK

Freshfields Bruckhaus Deringer

Introduction

This report summarizes the results of Freshfields Bruckhaus Deringer LLP's participation in the iSERVcmb project with regard to its HVAC system energy consumption. The report refers to the period from 2006 to 2013.

Building Profile

Freshfields Bruckhaus Deringer LLP HQ is an office block of 25,826 m² conditioned gross internal area arranged over 9 stories, in London, UK, with significant support areas include IT servers, IT suites, two full Restaurants, Gymnasia, Printing rooms and an 8-storey central atrium. The main elements of the system are 3 AHU's on the roof serving 4 cores with secondary AHU's on each floor. The heating and cooling are supplied by 3 roof mounted boilers and 3 basement located screw chillers, with heat rejection via wet cooling towers on the roof.

Sector	**Offices**
Location	**London, United Kingdom**
Construction Date	**1988/ 2008 re-commissioning of HVAC**
Area iSERV (m²)	**25,826 m²**
No. HVAC Systems	**42**
HVAC Components	• **Chillers** • **Pumps** • **Boilers** • **AHUs** • **Fans** • **Cooling Towers**

iSERV Achievements

Energy Savings
Electricity: 80 kWh/m²

19%
Total building electrical consumption reduction since participation

Cost Savings
Electricity: 7.5 €/m²

Emissions Reductions
Electricity: 0.042 tCO_2/m^2

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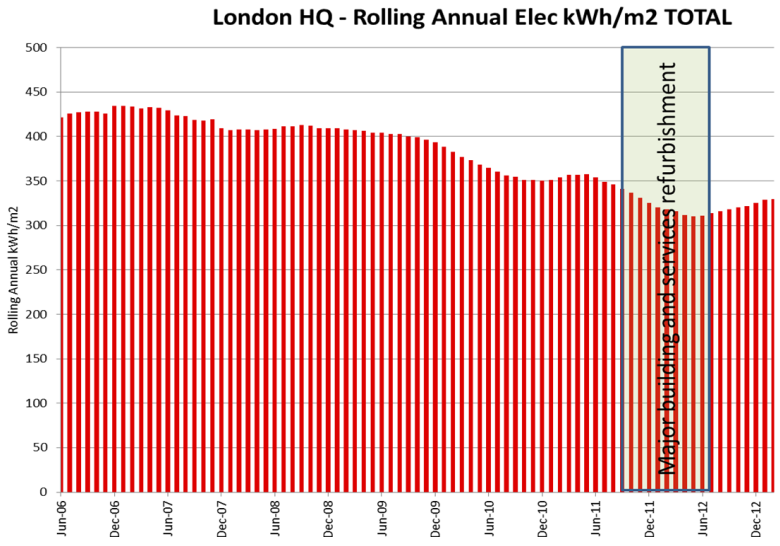
Building Management System installed

The building systems are controlled by a BEMS. The normal hours of use for the systems vary by each core zone on each floor of the building with local overrides for the AC system at each of the core AHU levels on each floor. Control has proved to be one of the main items available to the owner to reduce the energy consumption of all their services, including the AC systems.

Savings of 2,500 MWh/a due to improvements in HVAC system control and equipment

The building has had a lot of attention to its energy use over the period of iSERVcmb predecessor, the HARMONAC project, including the installation of an extensive electrical sub-metering system that it was hoped would answer many of the questions raised in this Study. The data collected was extremely useful in allowing a good estimate of the likely annual energy use at the level of the AC system components. Amending the control of building systems enabled the building to achieve a substantial 17% reduction in its overall electrical consumption with 60% of this likely to be due to improvements in HVAC system control and equipment. The gas consumption also showed an improvement, which corroborates the improvements seen in ventilation rate control as this affects the amount of heating needed of the incoming air.



The main quantifiable electricity and gas savings came from rescheduling the operating hours of the building by floor and zone; and from a new control algorithm for the building Chillers which prevents them from all running at the same time at lower cooling demands. The other potential major electricity saving appears to be from better control of the air change rates provided by 3 main AHU's to 4 cores of the building.

The annual electrical savings achieved before the major refurbishment in 2011 were around 2,000MWh (80 kWh/m^2/a) leading to a 19% reduction worth approximately 200k EUR/a or 7.5 EUR/m^2/a. Since its refurbishment in July 2012, additional reductions of approximately 5 to 10% are being achieved, but due to the metering system failing it is not possible to be clear where the savings are being achieved. The anticipated annual energy use savings by July 2014 are around 25% with a total reduction of around 2,500 MWh (100 kWh/m2/a) which translates to 250,000 EUR or 9.4 EUR/m2 per annum.

"The insights gained into the building services operation and energy use during HARMONAC and iSERVcmb have helped us understand our services much more clearly, and where we wish to invest in new equipment"
Stacey Collins – Health Safety and Environmental Manager, Freshfields Bruckhaus Deringer LLP, UK

Contact

Cardiff University
Ian Knight
King Edward VII Avenue
Cardiff CF10 3NB
M: Knight@cardiff.ac.uk

www.iSERVcmb.info
how energy efficient are you really?

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