iSERVcmb Best Practice

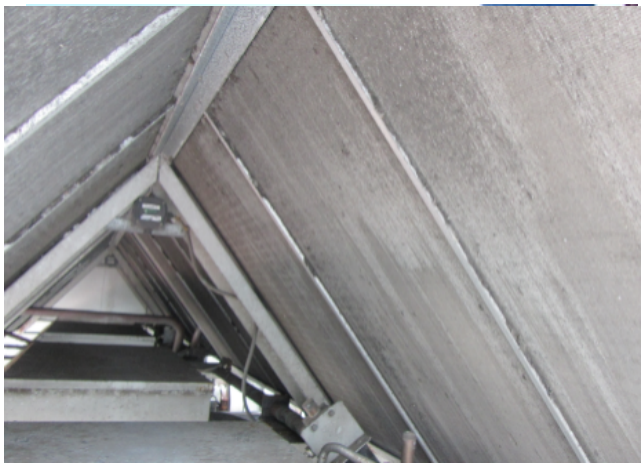
Electricity savings of 20% per year by adjusting the operation of the HVAC systems.

UP-Porto 31

31 – PT

Introduction

This report summarizes the results of UP-Porto 31, shopping center participation to the iSERVcmb project with regard to its HVAC system energy consumption. The report refers to the year of 2013.



iSERV Achievements

Energy Savings
Electricity: 15.1 kWh/m^2.year

20%
HVAC electrical consumption reduction

Cost Savings
Electricity: 2.3 €/m^2.year

Emissions Reductions
Electricity: 2.2 kgCO2/m^2.year

Investment to achieve savings
1.5 €/m^2.year

	Key Figures
Location	Senhora da Hora, PT
Sector	Retail
Construction Date	1998
Project Size	39,000 m²
EPC	N/A
Sub-metering Level	Party Metered
Data Frequency	Hourly
Data Collection Protocol	Meters and sensors attached to BMS
Data Sending Protocol	Automatically extract data & manually send to an email address
Nature of Savings achieved	**Improved Operating Schedule** **Improved HVAC Control**
No. HVAC Systems	7
HVAC Components	☐ Heat Generators ☒ Cold Generators ☒ All-in-One Systems ☐ Heat Pumps ☒ Air Handling Units ☒ Pumps ☐ Terminal Units ☐ Heat Recovery ☐ Heat Rejection

Building Profile

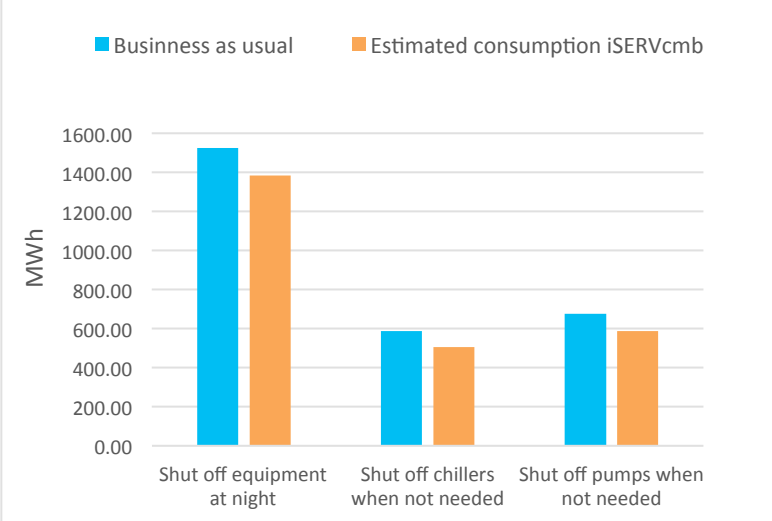
UP-Porto 31 is a shopping center of 39,000 m² conditioned gross internal area arranged over 2 stories, in Senhora da Hora, PT. The building is served by AHU's with heating, cooling, and filtration. Cooling is provided with chilled water from a combination of screw, centrifugal and absorption type liquid chillers, with a total Nominal Cooling Capacity of 11.6 MW. The chillers also serves, partially, an office building in the surroundings (district cooling).

Building Management System installed

The building systems are controlled by a BMS, and the system operates on an optimized stop and start. The BMS was also used for data collection in this case study. The building is occupied 10:00 to 00:00, Monday to Sunday.

Savings of 588 MWh/a due to optimized HVAC control

The data provided starts at May 2013 and includes energy consumption of electricity. Energy saving opportunities have been identified in several HVAC systems with a total estimated savings of 310 MWh on the analysed period.



This Energy conservation opportunities are mostly related to system control and utility manager awareness. This measures are represented in the figure on the right and include Chiller control improvement and turn off equipment when not in use. The estimated result of this measures could represent a reduction of 20% in the HVAC systems energy consumption. The reduction of the total annual building energy use can be reduced 15.1 kWh/m^2.year, representing electricity savings of 2.3 €/m^2.year with an estimated investment of 1.5 €/m^2.year, which represents a 35% profit of 0.8€/m^2.year.

The annual electrical savings estimated in the building are currently 588,000 kWh/year. This translates to annual CO_2 emissions reductions of 2.2 kgCO2/ m^2.year.

www.iSERVcmb.info

how energy efficient are you really?

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