iSERVcmb Best Practice

Electricity savings of 14% per year related to HVAC through continuous maintenance of the system.

Arlon Research Building

Université de Liège – **BE**

Introduction

This report summarizes the results of Université de Liège's participation to the iSERVcmb project with regard to its HVAC system energy consumption. The report refers to the period from 2012 to 2014.

Figure 1: Arlon research building

iSERV Achievements

Energy Savings

14%

Total HVAC electrical consumption reduction since participation

About 23 MWh per year

"Arlon Campus Environment is part of Université of Liège. The Arlon Research Building is an office building dedicated for researchers in various sectors of environment sciences including building energetical footprint. iSERVcmb tools helped to define precisely the in-house systems and to improve energy efficiency of the building. HVAC system has been designed in the seventies so as to be a precursor in renewable energy and energy storage. Nevertheless some applications became obsolete and iSERVcmb assisted the end-user to reduce electrical consumption of actual installation."

Julien Carton, research engineer of Université de Liège

	Key Figures
Location	Arlon, Belgium
Sector	Office
Construction Date	1970s
Project Size	2332 conditioned m²
EPC	N/A
Sub-metering Level	Fully 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 HVAC Control** **HVAC Equipment Replacement** **Improved Operating Schedule**
No. HVAC Systems	4
HVAC Components	☒ Heat Generators ☒ Cold Generators ☒ All-in-One Systems ☒ Heat Pumps ☒ Air Handling Units ☒ Humidifiers ☐ Dehumidifiers ☒ Pumps ☒ Storage Systems ☒ Terminal Units ☐ Heat Recovery ☐ Heat Rejection

Building Profile

Arlon Research building is a building of 2332 m² conditioned gross internal area dedicated for researchers of Université de Liège, in Arlon Campus Environment (Belgum). Offices and laboratories with and without fume cupboards are distributed over 4 stories. The building is served by a main HVAC system supplying a mix of fresh and recirculated air. Terminal units ventilo-convectors are located in each room to reach temperature set points. Heating is provided by thermal solar collectors and a fuel fired boiler. Cooling generation is insured by a reciprocating liquid chiller.

Building Management System installed

The building system is controlled by a BMS, developed in-house. The BMS was also used for data collection in this case study. The building is occupied 08:00 to 17:00, Monday to Friday. Operating current system schedule is 08:00 to 18:00. That one has been reviewed along the iSERVcmb project so as to adapt system schedule to user schedule.

Savings of 23 MWh/a related to HVAC due to optimized HVAC control

The data provided starts at August 2012 and includes energy consumption of electricity. Energy consumption for main HVAC system is shown to perform well related to benchmarks. Adaptation of schedules, replacement of air exhaust fan and optimization of HVAC control (e.g. CO_2 sensor for supply mix) helped to reduce electricity consumption by 10 kWh/(m^2.a). That means approximately 23 MWh per year. Replacement of the main chiller is planned for 2015. Evaluation of additional potential savings will be analyzed.

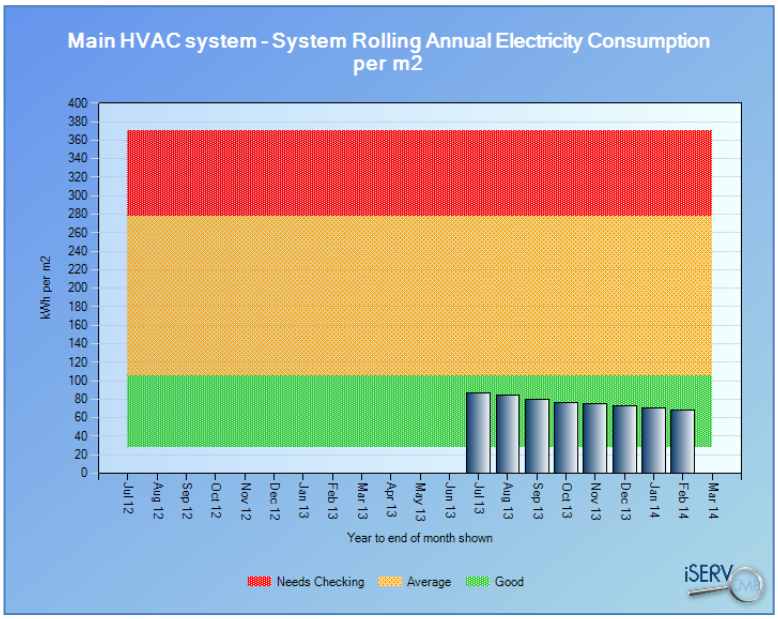

Figure 2: System rolling annual electricity consumption

Related to their own activity benchmarks, additional split systems for cooling laboratories are performing average or bad. Issue is that laboratories require low internal temperature set point for performing well. Nevertheless that point could be considered for future improvement of energy efficiency. For instance, split system for laboratories located on first floor should reduce consumption by 40 kWh/m^2 so as to reach good performance. That would mean additional reduction of 2 MWh per year.

Split system for cooling IT server room is performing well compared to benchmarks. Continuous in-house maintenance helps to insure right efficiency of the system. No major variation of energy consumption has been found in the frame of the project.

www.iSERVcmb.info

how energy efficient are you really?

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