

Project in brief

| MULTI PURPOSE BUILDING STUTTART | DISTRICT HOSPITAL HAGENOW | MINISTRY DÜSSELDORF | KREUZGEBÄUDE ESSEN | STATE TREASURY HELSINKI | HUT ENGINEERING DEPARTMENT ESPOO | AURORA 2 JOENSUU | SENATE HEADQUARTERS HELSINKI | INFORMATIC SYSTEMS MILAN | LECTURE HALLS MILAN
ELECTRONICS DEPARTMENT MILAN | **DUKA HOUSE GOTHENBURG** | NORDSTADEN GOTHENBURG

DEMONSTRATION BUILDING: DUKA HOUSE, GOTHENBURG (S)



Data acquisition as insurmountable hurdle

Due to massive problems with the acquisition of measured data, it was not possible to perform the full analysis as in the other demonstration buildings of Building EQ. Concerning the fault detection and diagnosis as well as the optimization, only preliminary observations could be achieved. Therefore, it was not possible to calculate any quantitative savings potential and a related cost-benefit.

However, the possible energy saving potentials are as follows:

- Adjustment of the pressure set points for the supply and exhaust fan respectively to avoid unbalanced air flows (supply/ exhaust)
- Adjustment of the pressure set points for the supply and exhaust fan respectively to avoid unbalanced air flows (supply/ exhaust), decrease fan energy and increase efficiency of heat recovery
- Adjust forward temperature set point curves for the heating system to avoid comfort problems
- Adjust set points for the fan-coil units in the two lower floors
- Adjust set point for the supply air temperature
- Adjust operation schedule of dampers in the ventilation duct to the two upper floors

Building characteristics

OWNER: AP Fastigheter

YEAR OF ERECTION: 1810, refurbishment 1995, 2003

NET FLOOR AREA: 1.770 m²

UTILIZATION: Retail, offices, school

CONSUMPTION OF ELECTRICITY: 62,000 kWh/a,
35 kWh / (m²·a)

CONSUMPTION OF HEATING: 230,000 kWh/a,
130 kWh / (m²·a)

BUILDING ENVELOPE: Historic massive facade

BUILDING SERVICES:

- Hydronic radiator systems
- Fan coils in the ceiling and chilled supply air
- Air handling unit in the attic
- Balanced ventilation with air-to-air heat exchanger
- Combined air heating/cooling coil supplied from the district heating and cooling substations

Results of the Building EQ project

- Energy saving potential in the operation of buildings 5 - 30 %
- Realisation of these potentials with low or no investment costs
- BuildingEQ methods and tools allow quick and cost efficient detection of these potentials
- Ongoing performance evaluation is prerequisite for energy efficient operation
- Consortium suggests amendment of EPBD with mandatory performance monitoring

Certification process in Sweden

Legal background

In Sweden, energy performance certificates are mandatory by law as of 1 Jan. 2009.

The energy expert delivers all data to be recorded on the energy performance certificate via a web interface to Boverket (The National Board of Housing Building and Planning), which performs a central statistical analysis of the data.

The law states that the suggested cost-effective energy efficiency measures may not jeopardize the indoor environment in any way.

Methods of calculation for existing non-residential buildings

There are no calculation methods specified. However, only the operational rating can be applied.

The electricity consumption of the user, that is indoor lighting, electrical devices, etc. shall not be considered. This makes operational rating complicated in buildings where the users do not have their own electricity contract, for example, hospitals and schools.

The area of reference is the net floor area, whereby the surface area of the interior walls and shafts is also included here, in contrast to other floor area definitions in Sweden.

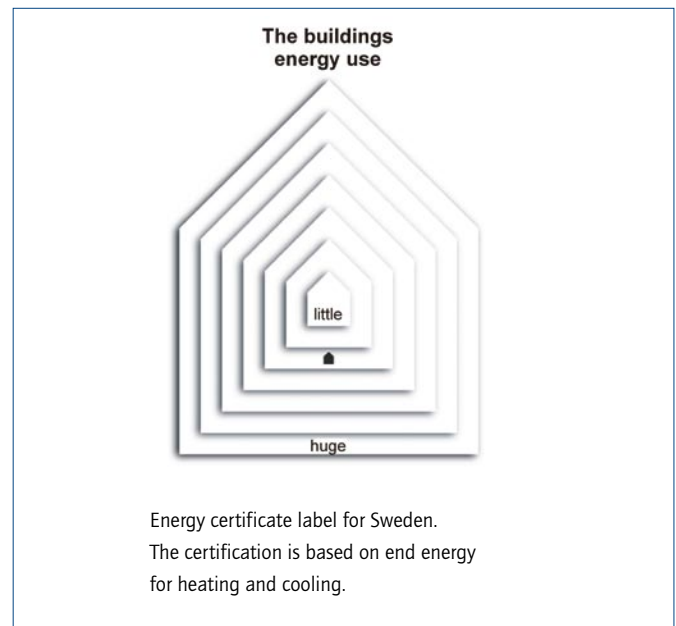
Classification

The energy efficiency evaluation is carried out by classifying the building into one of seven classes. These are graphically portrayed.

The class with the highest energy consumption, independent of the building use, corresponds to an energy consumption of over 400 kWh/m²a.

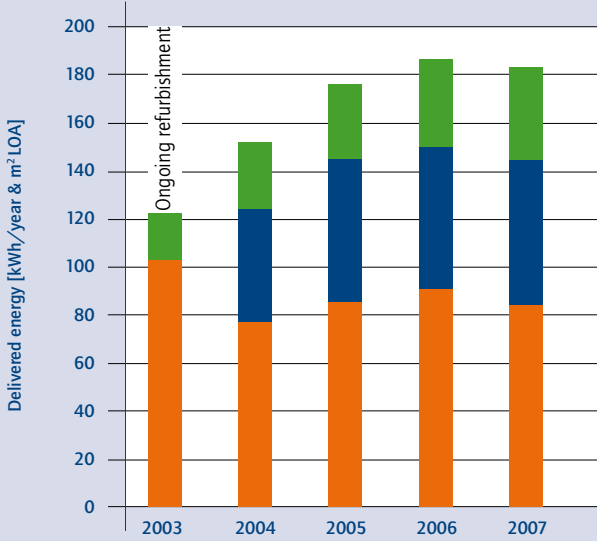
Evaluation / Discussion

As of 2009, the obligatory posting of the certificate will not be met in many public buildings, since there is not a sufficient number of experts available. Currently, discussions are taking place about handling the breach.

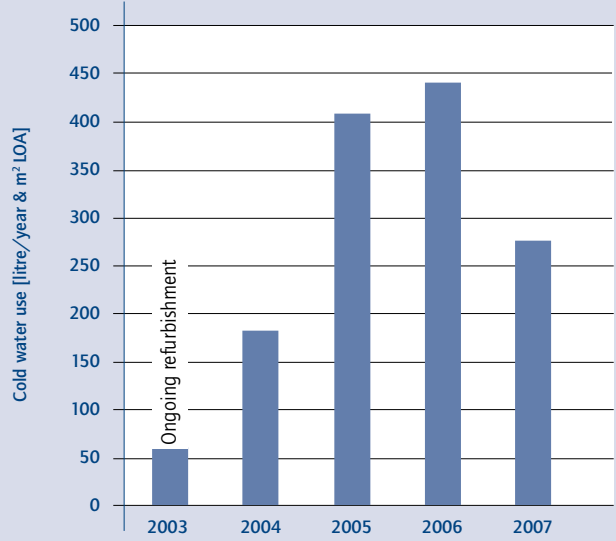


Overview energy consumption data

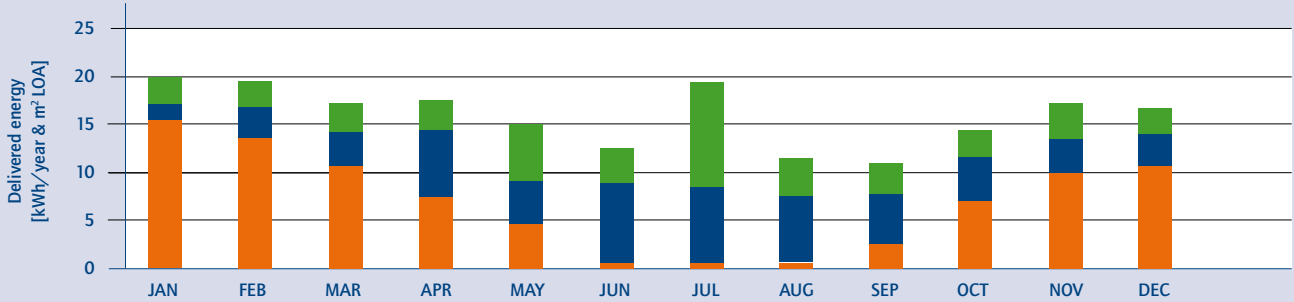
I. Energy consumption 2003 – 2007



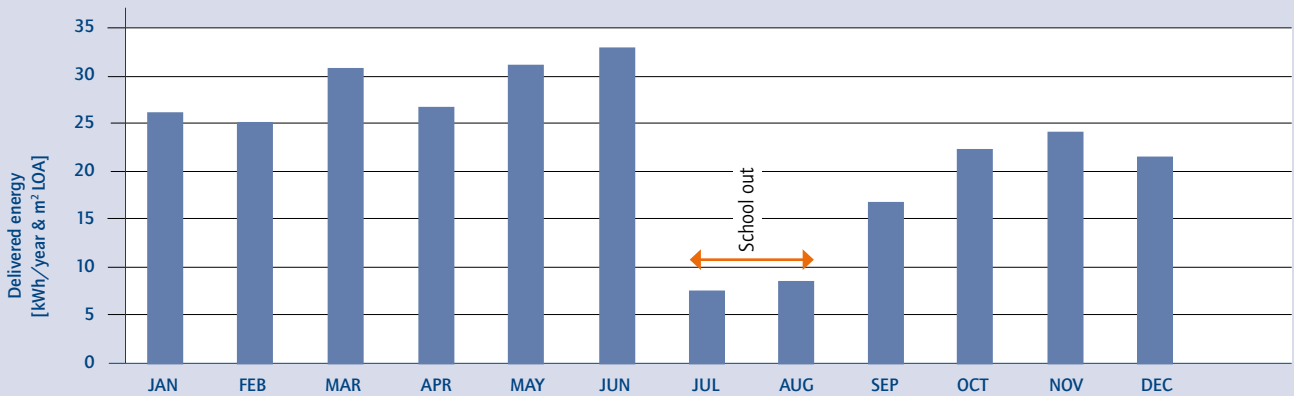
II. Water consumption 2003 – 2007



III. Energy consumption monthly 2007



IV. Water consumption monthly 2007



■ District heating ■ District cooling
■ Property electricity ■ Cold water

■ Project Partner

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■ About Building EQ

BuildingEQ is a project in the Intelligent Energy Europe Programme of the European Commission. BuildingEQ aims at strengthening the implementation of the EPBD (Energy Performance of Buildings Directive) by linking the certification process with commissioning and optimisation of building performance. Within the scope of the project, methodologies and tools are to be developed that can be used for ongoing commissioning and optimisation of non-residential buildings using gathered data from the certification process according to the EPBD.

The emphasis will be on feasibility and cost-effectiveness of energy reduction measures with regard to building practice. Main target groups are the industry for Facility and Energy Management, real estate owners, energy agencies and energy consultants.



The consortium at a project meeting in Stuttgart

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