# Public administration buildings

## Case study

CIRCUTOR

*Energy efficiency technology*

# Public administration buildings

PROJECT
Improve energy efficiency in a public administration building

SECTOR
Public administration

CLIENTE
Catalan Energy Institute (ICAEN)

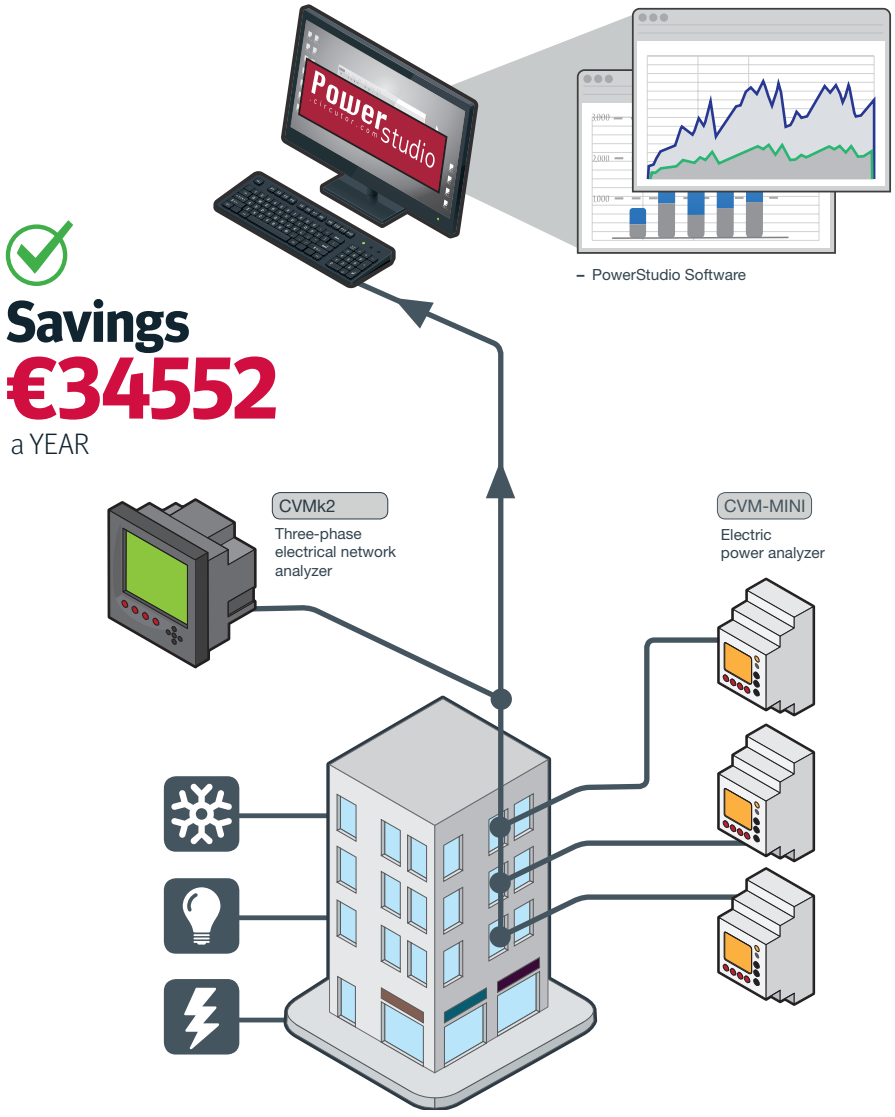
Information of interest
Energy ratio

## Most significant results

SAVINGS
€34 552 a year
(22.5% of the electricity bill)

INVESTMENT
€17 936

PAYBACK PERIOD
6.2 months




**Thanks**

We would like to thank ICAEN and the Department of Business and Employment of the Government of Catalonia for their collaboration.

"The integrated measurement and control system saved €34,552 on the electricity bill during the first year and ensured better energy monitoring and a more environmentally sustainable building.

## Initial situation

The Department of Business and Employment building is the headquarters for the Ministry of Energy, Mines and Industrial Safety, the Catalan Energy Institute (ICAEN) and the Catalan Consumer Agency. It had an annual energy consumption of 1 535 650 kWh, with an annual energy cost of €153 565 as well as a contracted power cost of €24 300 per year. The managers therefore prioritised improving the energy efficiency of the installations in order to reduce the average monthly energy consumption, which was 127 790 kWh.

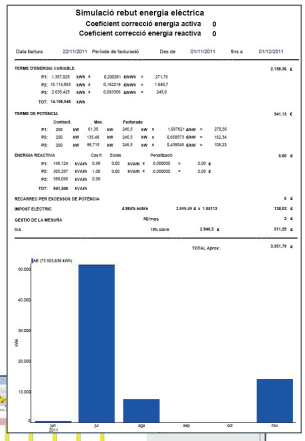
The primary energy costs were air conditioning (36%) and lighting (25%). Consumption fluctuated given the normal working hours in the offices, although they were more variable than they should have been. There was no energy consumption forecasting or any comparison with previous months and years. According to the agreement of the Government of Catalonia, in their Energy Efficiency and Savings program of July 2007 and August 2011, to conduct energy audits in all Government buildings and premises with an annual consumption greater than 200 000 kWh, this building logically falls under said program.

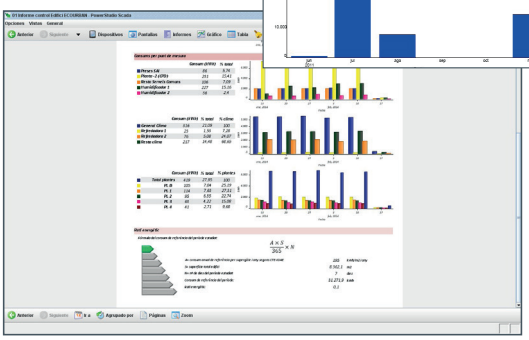
## Objectives

The main objective was to optimise the building's energy consumption to reduce costs. However, the Department of Business and Employment went even further in their commitment to:

› **Home screen**
The home screen shows the instantaneous powers of all the measuring points, as well as the kW/m2 ratio. The application's different screens are accessed via this screen.

› **Electricity bill simulation report**
Using the access tariff function, the building can simulate its electricity bill, taking into account the measurements performed and the defined calculation parameters.



› **Weekly energy report screen**
The weekly energy report screen shows the total consumption at each measuring point, as well as the building's energy ratio in accordance with the CTE-IDEA standards.

## Solution

For the project, electric power analyzers with **CIRCUTOR CVM** communications were installed at different points of the installation in order to know the balance of the building's internal consumption and be able to observe the evolution, morphology and time periods of consumption.

Three steps were taken for such purposes:

1. Measurement with **CVM type power analyzers: CVMk2** on the general supply service line connection and **MINI MC CVMs** on each floor, as well as the General Services, Ground and Basement floors and the Building's General Air Conditioning, computing UPS and computing Air Conditioning. Each one had current transformers, and RS485 serial communications to find out the energy consumed.
2. **Development of a personalised energy management application** for the Department using the SCADA PowerStudio application, calculating, viewing and preparing the corresponding reports.
3. **Improvements in three areas** in accordance with the data collected: improvements in managing **lighting**, the **machines** that remain on and the **air conditioning.**

As a result, thanks to the energy measurement system, it was observed that the **weekend energy consumption** measurement was unjustifiably high. As a result, the following measurements were taken:

- The air conditioning was stopped.
- Control of machines that were unproductive during the weekend.
- Control of unnecessary lights.

The lack of correspondence between the consumption curve and the building occupation schedule was corrected. This was resolved by:

- Reducing the number of lights switched on during security rounds and programming staged switch offs at 20.00, 22.00 and 24.00 to prevent lights being left on all night.
- By reviewing and disconnecting machines that remain on.
- By redistributing and modifying the operating hours for the air conditioning machines.

- Improve the use of electrical energy.
- Reduce, control and structure internal consumption.
- Supervise and control electricity billing parameters to simulate electricity billing and draw up cash-flow forecasts.
- Finding out the actual consumption during different time periods to contract the best company and energy tariff.
- To do this it used data and studies reported by the units and the CIRCUTOR SCADA PowerStudio energy management software.

## Results

As a result of applying all the measures taken, energy consumption was reduced by 20% in the period 2012-2013, with total savings on the annual electricity bill of 22.5% (€34552) in 2013.
As a result of the implementation of the management system and application of corrective measures the following results were achieved:

- Inefficient consumption detected and corrective measures applied.
- Savings in the measurements taken were recorded.
- Payback on the investments made was calculated.
- Evaluation and continuous improvement criteria applied.
- Maintenance works controlled and improved.

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