# Data processing centre
## Case study

CIRCUTOR
*Energy efficiency technology*

# Data processing centre

PROJECT
Improving the energy efficiency of a data processing centre

SECTOR
IT

CLIENT
Data processing centre

Information of interest
**PUE** (Power Usage Effectiveness)
Efficiency of energy use

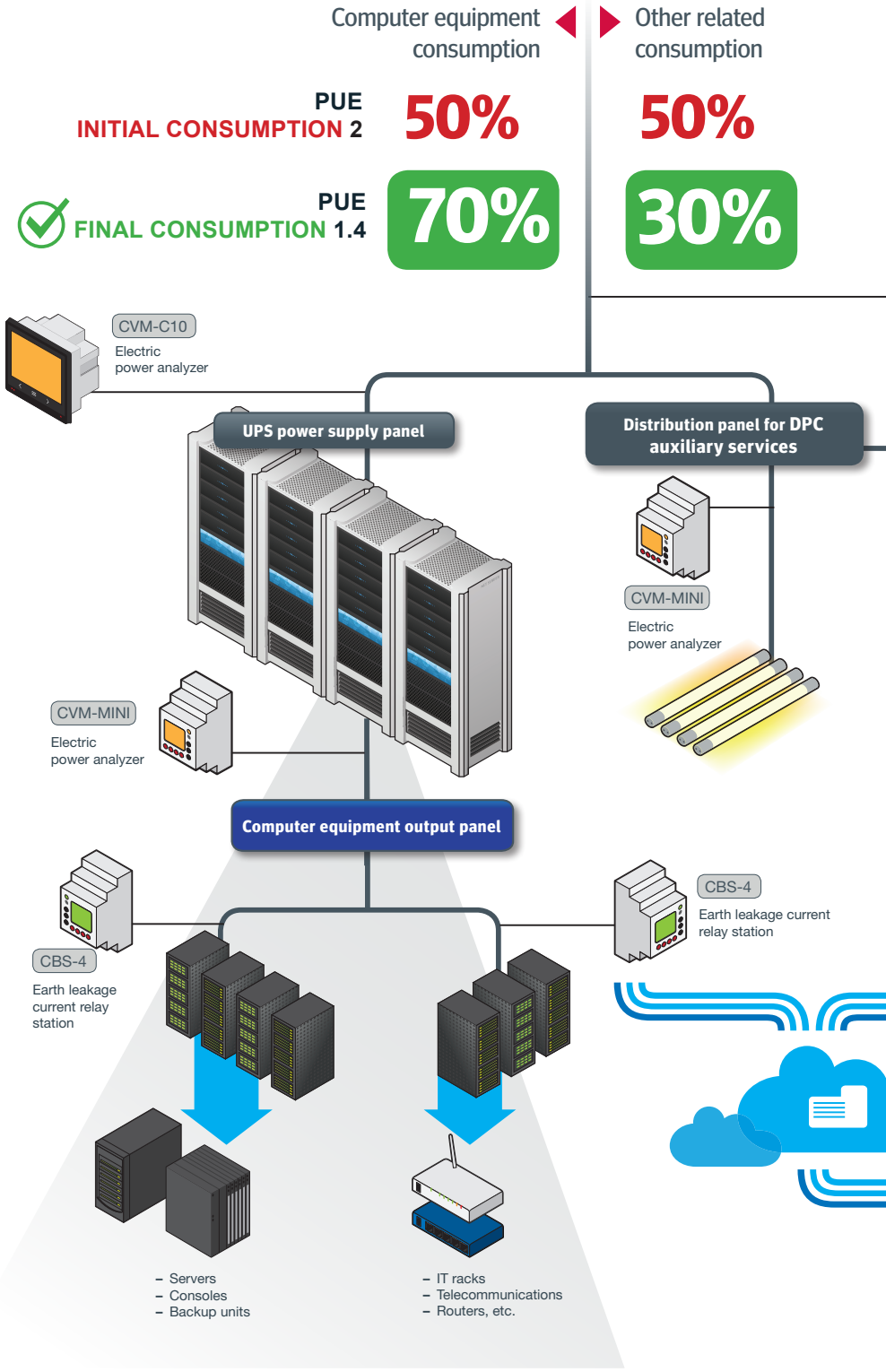
## Most significant results

SAVINGS
€8000 a year

INVESTMENT
€6000

PAYBACK PERIOD
9 months

TARGET ACHIEVED:
**Optimising energy consumption to achieve a PUE of 1.4**




## Initial situation

The data centre has 100 kW of installed power with €80000 in annual energy costs. Its managers prioritised the energy efficiency of the installations in order to reduce the monthly average energy consumption down to 72000 kWh.

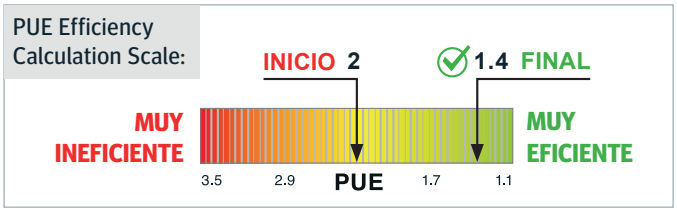
**The major energy costs came from the computer and air conditioning systems.** Consumption was constant, as the data centre ran on a 24/7 operation. There was no energy consumption forecast or comparison with similar data centres.

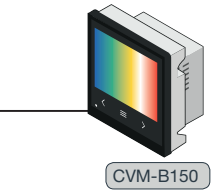
They wanted to find out their **PUE (Power Usage Effectiveness)** value and compare it with those of other data centres, so they could determine their current level of efficiency as well as the factors needing improvement in the installation.

## Objectives

The main objective was to optimise the centre's energy consumption to reduce costs.
This objective was subdivided as follows:

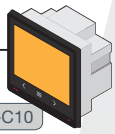
- Finding out the centre's energy efficiency ratio (**PUE**).
- Comparing this **PUE** with similar centres to find out if the centre is above or below average.
- Monitoring and controlling electrical energy billing parameters: to simulate electrical energy billing and draw up cash flow forecasts.
- Finding out the actual consumption during different time periods to contract the best company and energy tariff.



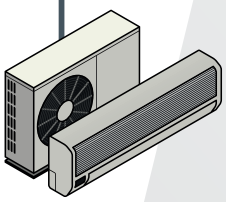
CVM-B150

Electric power analyzer



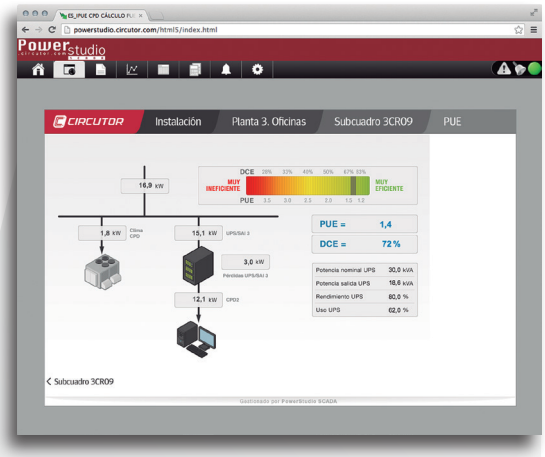
CVM-C10

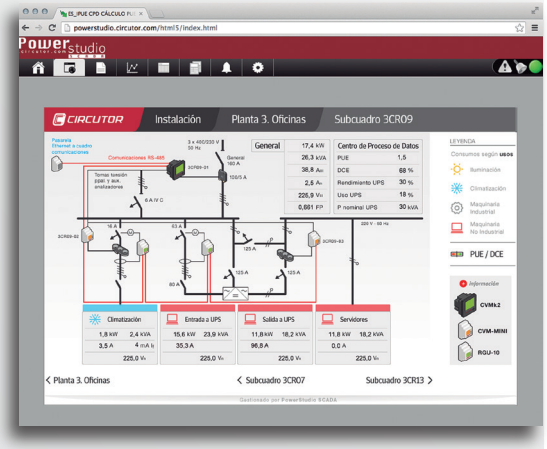
Electric power analyzer

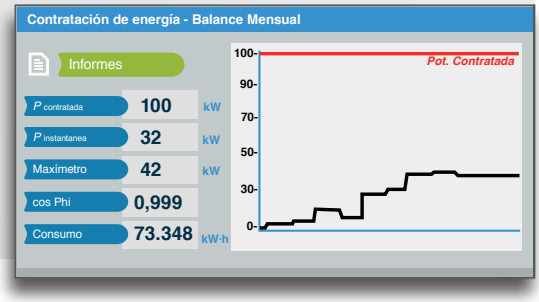


- Room Air Conditioning
- Lighting
- Unit refrigeration
- Auxiliary power points
- Various services
- Etc.

- Software PowerStudio




PUE: Power Usage Effectiveness, calculated with the formula

$$PUE = \frac{\text{Total energy supplied}}{\text{Energy for computer equipment}}$$

Moreover, the Environmental Protection Agency of the United States (EPA) provides the following PUE values as a reference:

- Historic 2.0
- Current trend 1.9
- Optimised operations 1.7
- Best practices 1.3
- State-of-the-art 1.2

## More information about the solution

The application features:

- A first screen in single-line diagram format with real consumption and system status by line.
- A second summary screen with performance calculations, enabling you to create and display reports with results for different periods (daily, weekly, monthly and yearly)
- In addition, the system lets you define the maximum server group size and switches off unused capacity, always maintaining service levels.

› By monitoring the actual power consumed, it was possible to reduce the amount of power contracted in some centres, achieving an annual reduction of €2000 in the electricity bill

## Solution

**Of the total energy consumed in the DPC, 60% corresponds to the electrical consumption of the infrastructure and the remaining 40% to refrigeration.** Therefore, one of the keys to the success of the energy improvement project was measuring the consumption of each unit type in order to be able to recognise the most affordable areas of improvement.

Three steps were taken for such purposes:

- Measurement using **CVM** power analyzer units with their corresponding current transformers and RS485 serial communications to find out how much energy is circulating.
- Analysis using the **PowerStudio SCADA** application, calculating the **PUE**, viewing and preparing the corresponding reports.
- Improvements in three areas in accordance with the data collected: Reduction in contracted power, as it was found that the actual maximum power never exceeded the contracted power. Changes to room management by correctly controlling and adjusting room temperature. Lighting optimisation.

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