

Applications

Josep Lluís Orts
Systems Department

Energy control and Management

Example of energy savings at a Citroën car dealership



3SL Aplicaciones Integrales Eléctricas, is a company that specialises in electrical installations. Major increases in electrical energy costs and the demand from the internal market have led us to specialise in energy consulting services to enable us to offer our clients greater returns from their installations.

www.tressl.es

Type of installation:
Car dealership
CITROËN GARAJE ELOY

- m² of showroom space: 1.305
- m² of workshops: 4.085
- m² of offices: 330
- m² of warehouse: 500
- Access tariff: 3.0A

- Utility company: Endesa
- Contracted power: 175kW
- Annual consumption in kW-euros 2012: 260.000kW – 55.000€ approx.

Since its creation some 5 years ago, our technical team has been constantly working on the development and implementation of an energy control system for electrical, gas, air, nitrogen and other energy sources that can make the maximum effective use of energy consumption at installations.

Installed units are provided with WEB-based remote control systems that enable us to store all the data on a secure server for subsequent processing; the data is then analysed to see what measures can be applied to the units to achieve the greatest possible efficiency.

This process leads to sizeable energy

savings, which in turn create savings in overall costs.

For example: an installation that operates as a car dealership, with a

- Showroom of 1,305 m²
- Workshop surface area of 4,085 m²
- Office surface area of 330 m²
- Warehouse surface area of 500 m²

To analyse the client's installation we install units manufactured by CIRCUTOR. A prior visual inspection of the installations is performed to establish the most critical points in terms of consumption. The car showroom area where customers are attended is the most complicated one to acclimatise because of the m² and the solar

orientation, and so we decided to control the area's air conditioning and lighting consumption.

We then decided to control overall consumption by installing CIRCUTOR units in the general switchboard to compare real readings with those billed by the utility company, control reactive energy, power demand, etc.

The investment made in control and management units is approximately 4,000€, and consists of an EDS control unit and 4 CVM MINI analyzers in the air conditioning panel. An EDS 3G unit and a CVM MINI power analyzer are installed in the general switchboard. **An investment** of approximately

5,000€ divided into three blocks has been made in the improvement section: firstly, improvements in air conditioning control with the physical installation of temperature probes and control relays for the start-up of the air conditioning units.

The second block consists of technical support for temperature programming and automatic operating schedules of the machinery, along with WEB-based control of every parameter and on-line alarm generation.

The third block consists of the installation of a power factor correction bank to eliminate unwanted generation. An investment return period of less than one year was calculated.

One of the major pluses of this system is that the user can consult the status of the installation any time, anywhere and can even take appropriate measures, he can also receive pre-defined alarm e-mails and so anticipate future breakdowns or excessive energy bills.

The results are really encouraging, a reduction of 11% to 24% is already being achieved; real data for 2012-2013.

The figures for the month of August are quite spectacular, the organisation obtained savings (compared to the same month in the previous year) of 28.74%, which represents 1,879.27€, at the same level of business activity as the year before.▶



Based on the consumption of our installations we can determine the "carbon footprint" that we are leaving in the atmosphere



Example of how on a single screen of CIRCUTOR PowerStudio energy control software we can control:

- General consumption
- Air-conditioning unit consumption
- Showroom lighting consumption
- Exterior and showroom temperature



EDS / EDS 3G, New Data Logger with built-in Web Server Auditing 365 days a year

Is a simple, powerful industrial device, able to display, through its built-in Web and XML Server, all the electric variables from power analyzers or other field devices directly related to measuring consumption, electricity, water, gas, etc.

CVM MINI, Three-phase electrical power analyzer

The ONLY analyzer suitable for DIN rail distribution boards, only 3 modules

Measures, calculates and displays in true effective value (TRMS) the main electrical parameters for balanced and unbalanced, three-phase electrical systems.

OPTIM 1, Capacitor bank

The OPTIM series automatic capacitor banks are units designed for automatic reactive energy compensation in networks with fluctuating loads and power variations lasting seconds, through operations carried out by contactors.

Its simple installation, high technology and robustness make the OPTIM series the ideal units for compensating reactive energy in installations with fluctuating load levels.

Conclusion:

New electrical parameter monitoring units can be used to check the following:

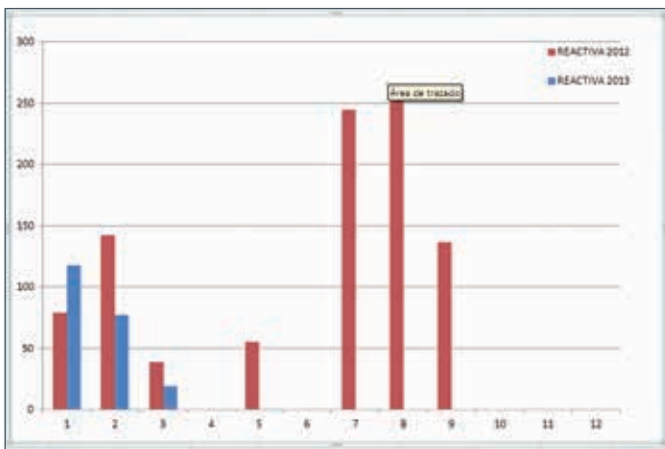
- The distribution of consumption (**what** and **how much** is consumed)
- The load profile (**when** consumption takes place)

The appropriate measures can be taken with this information, these reports and graphics to:

- Permanently optimise and control installations, which facilitates their maintenance and improves their reliability
- Achieve important savings and reduce the annual electrical energy bill
- Forecast and check consumption and the electrical energy bill, i.e., general consumption and consumption distributed by use (lighting, air-conditioning, driving power, etc.)

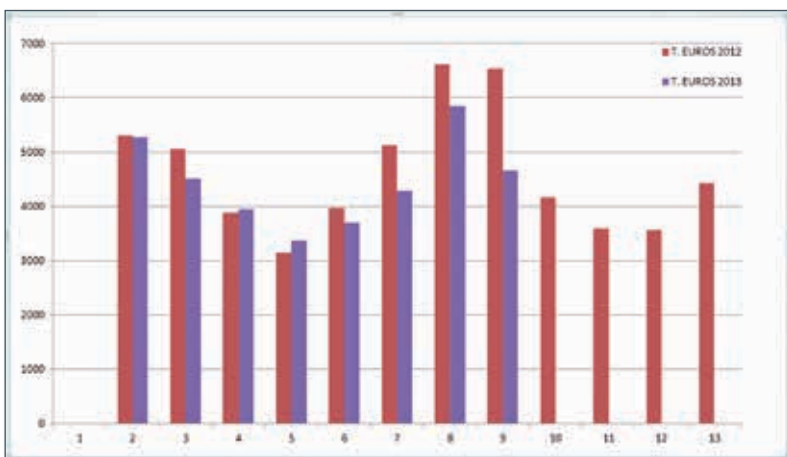
However, the actions described in this report forecast savings of 11 to 24%, but we also have access to "**Dossier-3SL-VEHICLE EXHIBITION AND SALE PLANT**", from which we can calculate **a 61% profitability (annual savings of 13,000 euros) of the investment, representing savings of 23.6% of the annual electricity bill over the total consumption of the plant.**

Total reactive energy consumption in Euros



To eliminate reactive energy generation and expense, a CIRCUTOR OPTIM series capacitor bank was installed for power factor correction. An investment return period of less than one year was calculated.

Total electrical energy consumption in Euros



From 11% to 24% savings in the first year

Comparison of energy savings in euros for 2012 and 2013.

Reductions of 11% to 24% were achieved

We can see that electrical energy consumption in euros have decreased since June (installation date of the complete energy savings system); the same change can be seen in the reactive energy consumption graphic.