



Waste water treatment plant

Case study

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PROJECT

Improve the energy efficiency of a waste water treatment plant

SECTOR

Water treatment

CLIENT

Catalan Water Agency

Information of interest

Efficiency improved after an **8.5% reduction** in the (EnPI) kWh/m³ ratio of treated water

Most significant results

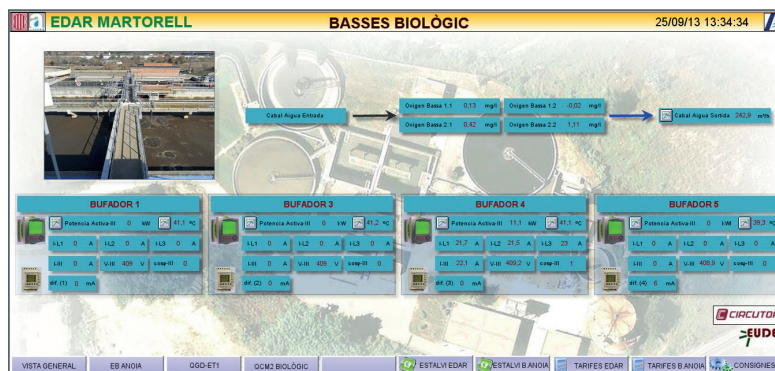
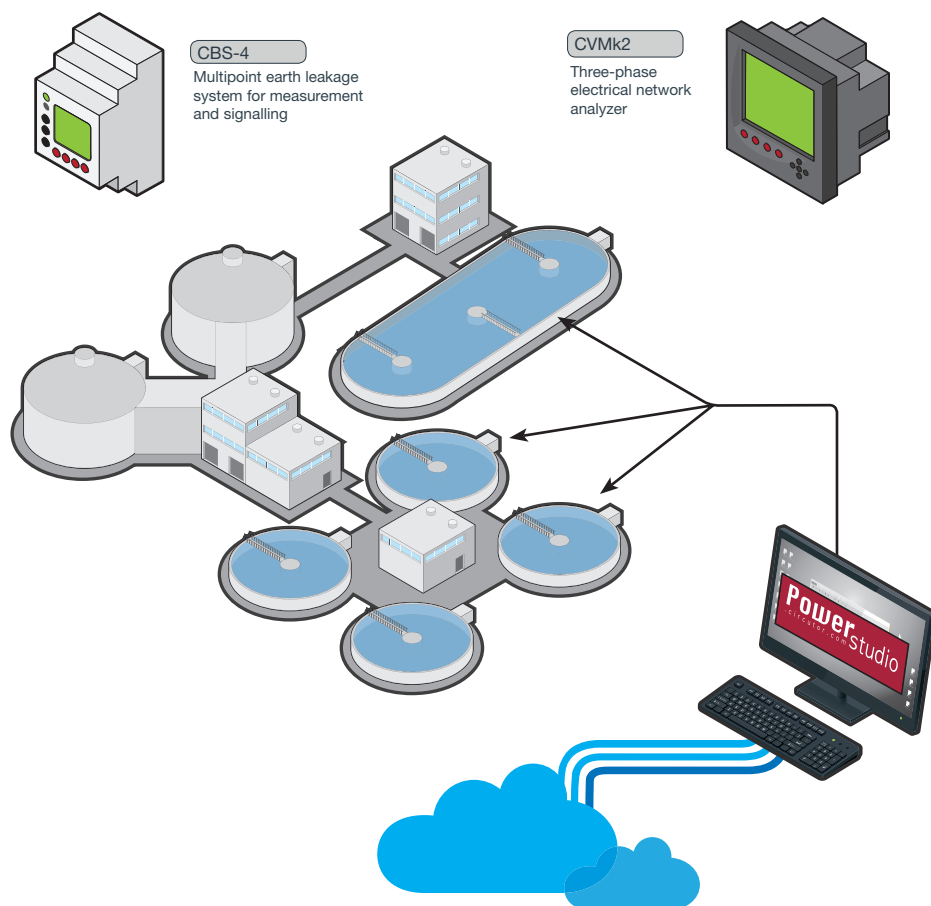
Fall in energy consumption:
69,745 kWh/year (-8.6%)

SAVINGS

€27029 a year

Thanks

We at CIRCUTOR would like to thank Jordi Robuste at the Catalan Water Agency for his collaboration. The material and application are the property of the Catalan Water Agency, and the idea and development of the application is the work of Companyia General d'Aigües de Catalunya SA and Eudea Mercavia SL. We would also like to thank Iñigo Urruchi Sagredo, Martorell Treatment Plant Manager, for his help.



Overview of the new energy acquisition, supervision and control software

Initial situation

The Catalan Water Agency, the water authority responsible for planning and executing the water policy of the Catalan government, has been implementing the Savings and Energy Efficiency Programme (PEEE in Spanish) in water treatment installations in Catalonia since the end of 2008.

As part of the actions of the PEEE, the Martorell Waste Water Treatment Plant in Barcelona, which is managed by the Catalan Water Agency through the operating company, Companyia General de Aigües de Catalunya S.A., implemented actions to improve energy efficiency via measurement units and an energy telemanagement system, to significantly

reduce energy consumption in the installations and extend the useful life of the main electromechanical units. This action received financial support from the Catalan Energy Institute.

Before the improvement, the total energy consumption of the Martorell Waste Water Treatment Plant and Anoia Pumping Station, in the year between September 2010 and August 2011, was 1,123,716 kWh.

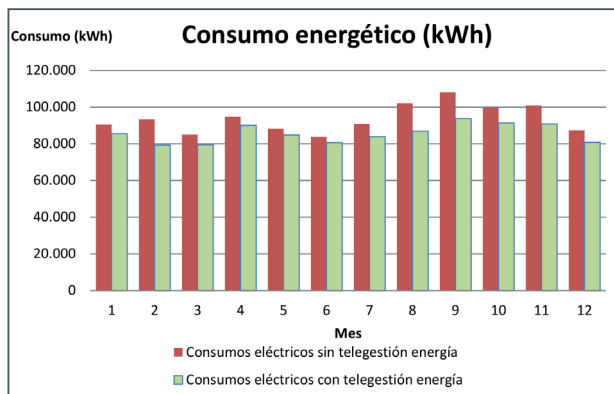
Objectives

The main objective was to optimise the centre's energy consumption to reduce costs. The energy consumption of a Waste Water Treatment Plant represents approximately

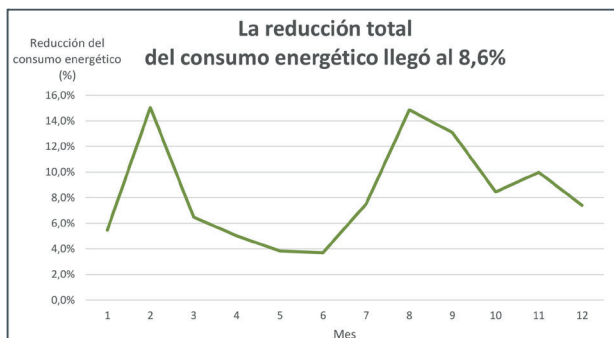
› Table with a description of the energy saving lines applied:

	SANEAMIENTO MARTORELL	ENERGY SAVING	
		kWh/year	€/year
ENERGY SAVING	WWTP header pumps	4,560	491
	Anoia Pumping Station Pumps	3,825	412
	Aeration blowers	61,360	6,615
OTHERS SAVINGS FOR THE PROJECT	Dehydration during period P3	0	2,120
	Optimum tariff 6.1	0	6,320
	Excess reactive power	0	8,227
	Power excess contracted	0	1,227
	Improvement of predictive maintenance (unscheduled stoppages)	0	1,617*
	Total	69,745	27,030

*estimated



› Comparison of the energy consumption before and after the implementation of the improvement



› Graph showing the energy saving over the last 12 months

More information about the solution

The solution consisted of the installation of a series of **CVMK2** power analyzers at strategic points to collect the installation's necessary electric data values. **CBS4** multipoint earth leakage systems, a computer with SCADA management software and a fibre optic communications network were also installed to collect data and coordinate all the operations.

The main units and their implementation are detailed below:

- **CVMK2** power analyzers for the different areas of the plant, logging values for voltage, current, power and other electrical parameters.
- **CBS-4** multipoint earth leakage systems each with 4 channels, logging the current and leakage values to anticipate possible service stoppages in:
 - › Pre-treatment (dirty water pumps)
 - › Activated sludge process (primary decanting, aeration, agitation, internal and external recirculation and secondary decanting)
 - › Each of the aeration blowers for the biological reactors
 - › Dehydration units (centrifuges and sludge transportation),
 - › Capacitor bank
 - › Leakage current of the four aeration blowers.
- Roll-out of a fibre optic communications network with four devices to reliably collect all field data and control the units remotely.
- Implementation of **CIRCUTOR SCADA Powerstudio energy management software** to improve the electric energy management, efficiency and control of the installation.

The data can be integrated thanks to the installation of these units and telemanagement, improving the electric energy management and thus achieving the project objectives.

Savings 
€27,029
 a YEAR

Results

With the implementation of a measuring, control and telemanagement system for Martorell's Waste Water Treatment Plant, the installation's electric energy management was improved, with energy ratio (EnPI) kWh/m³ savings of 8.6% and annual cost savings of €28,029, allowing payback on the investment in under 12 months.

The punctual control of the energy consumption of the electromechanical units and the detection of deviations in the specific electrical parameters measured (mainly current and voltage) enabled the adoption of a predictive maintenance program based on the early detection of breakdowns, which reduced the number of potential breakdowns and lengthened the useful life of units. ►

20-25% of the total operation and maintenance costs, which is why it is so important to reduce this cost. This objective was subdivided as follows:

- Improve energy management and its efficiency.
- Achieve economic savings as a result of a correct electric energy management approach.
- Reduce service outages in installations.
- Obtain an electric supply quality diagnosis.
- Make available preventive maintenance procedures in lines and electrical installations.
- Allocate electricity costs to production processes.
- Optimise the modification of contracted tariffs, shifting consumption loads to cheaper periods, etc.

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