BEST PRACTICES CATALOGUE IN energy efficiency
Acknowledgements

PRESIDENT
Borja Prado, Chairman of Endesa

PROJECT DIRECTOR
Jesús Abadía, Endesa

COORDINATOR
Paola Castañeda, Club de Excelencia en Sostenibilidad

CONSULTATION COMMITTEE
Ferran Balcells, Aena
Ana Belén Margalef, Aena
Jose Angel Rupérez, BSH Electrodomésticos España
Ramón Villacampa, BSH Electrodomésticos España
Ruth Millán, CEMEX Spain
Eduardo Pons, CEMEX Spain
Isabel Castillo, Club de Excelencia en Sostenibilidad
Concepción Cánovas, Endesa
Angel Fraile, Endesa
Carlos Urcelay, FCC
Manuel Soriano, Holcim Spain
Mónica Oviedo, Iberdrola
Fidel Pérez, Spanish Institute for Energy Diversification and Saving
Alberto Vivaracho, Spanish Institute for Energy Diversification and Saving
Ana Jimeno, ISS Facility Services
Jose Luis Lafuente, Mondragón
Juan Antonio Caballero, NH Hotels
Jesús Guijarro, Orange Spain
Mercedes Gil, Red Eléctrica de España
Gabriel Castañares, Renfe
Juan Antonio Gil, Renfe
Antoni Ros, SEAT
Jaime Trueba, SEAT
Rosa Gómez, Vodafone Spain
Francisco Rodríguez, Volkswagen Navarra
INDEX OF BEST PRACTICES

11 Climate Change
14 ABB
16 Aena Aeropuertos, S.A.
18 Grupo Leche Pascual
20 LKS Ingeniería S.Coop
22 Miguel Torres, S.A.
24 PepsiCo Iberia
26 Renault Spain, S.A.
28 Sacyr

31 Green public procurement
34 Alcorcón City Council
36 Bollullos de la Mitación City Council
38 Sabadell City Council
40 Soto del Real City Council
42 Lumínica Ambiental

45 Dialogue with Stakeholders
48 Alcampo
50 ISS Facility Services
52 Industria de Turbo Propulsores, S.A.
54 Sener

57 Eco-design and Technological Innovation
60 Gestamp
62 Grupo Antolin
64 Grupo Eroski
66 Leroy Merlin Spain
68 Metro Bilbao, S.A.
70 MRW
72 Nueva Tecnología, Rehabilitación y Reformas, S.L.
74 Orange Spain
76 Orona, S. Coop.
78 Vodafone Spain, S.A.U.

81 Infrastructure
84 Aqualogy Aqua Ambiente Servicios Integrales, S.A.
86 BSH Electrodomésticos España, S.A.
88 CEMEX Spain, S.A.
90 Eco2Next Solutions, S.L.
92 Grupo Antena 3
94 Holcim Spain, S.A.
96 Laboratorios del Dr. Esteve, S.A.
98 NH Hotels
100 SEAT, S.A.
102 Técnicas Reunidas, S.A.

105 Measurement and Control
108 Consum Sociedad Coop. Valenciana
110 Districlima, S.A.
112 Endesa
114 Ferro Spain, S.A.
116 Grupo Mahou-San Miguel
118 Red Eléctrica de España, S.A.U.
120 Volkswagen Navarra
According to the International Energy Agency, the inexorable rise in the world’s population and increased individual and collective use of energy will mean twice the amount of energy is consumed in 2030 as was consumed in 2004. Meeting this need will require a huge investment of financial resources in an environment in which energy is becoming increasingly scarce and thus more expensive. All this will result in a foreseeable gradual rise in energy prices and also in greater environmental problems.

Spain, with an external energy dependence of about 80%, much higher than the European average of 50%, will be more vulnerable to these cost factors, which will have a greater effect on its competitiveness. Improving energy efficiency is therefore crucial both in business and in domestic economy. Producing “negajoules” is undoubtedly the most economical form of energy management.

The potential for energy efficiency improvement is still huge, as are the associated benefits. Recent reports predict significant job creation in the implementation of more efficient technologies in both production processes and in products and services. The contribution of these technologies to the reduction of greenhouse gas emissions and hence anthropogenic global warming is indisputable.

Improving energy efficiency is undoubtedly an important goal of any responsible company in sustainability management. It is also an area of activity where everyone gains from the undoubted economic, social and environmental benefits. It also represents one of the most obvious ways of creating shared value and is very favourable ground for innovation.

The Club de Excelencia en Sostenibilidad, guided by its mission of promoting sustainability from the corporate sphere, publishes this catalogue with 44 best practices in energy efficiency, trusting they will contribute to business excellence and the progress of society.

José Longás Pellicena
President
Club de Excelencia en Sostenibilidad
Promoting a culture focused on responsibility, leading to an innovative way of thinking about global corporate sustainability is one of the objectives of the Club de Excelencia en Sostenibilidad which, through this Best Practices Catalogue in Energy Efficiency, presents 44 experiences carried out by either large companies, SMEs or public administration, sharing a wide range of initiatives ranging from measures in infrastructure to dialogue with stakeholders, passing through eco-design and technological innovation.

Integrating business and sustainability is critical for creating new values that will maintain confidence and security in the actions of companies. Achieving competitive sustainability is possible because different social agents are involved in a defined and shared policy for the management of environmental resources, ensuring the development of a sustainable future, as shown by the 44 experiences presented in this publication.

Endesa, as one of the ten companies in the world, within its sector, most involved in the fight against climate change and member of the Global Compact LEAD initiative created by the United Nations (UN), which groups the world’s top 54 companies in terms of sustainability, could not fail to be present on this occasion.
At Endesa we understand that sustainability is not a voluntary choice; it is an essential and urgent condition to ensure viability in the medium term. In this respect, the commitment to an active energy efficiency policy is a commitment of Endesa to the society in which it operates, through an open proposal for promoting energy efficiency from the side of both supply and demand through new business models which are highly profitable from both a business and social viewpoint.

The welfare of society involves consuming energy more efficiently as a premise for a sustainable and self-supplying energy environment. In this respect, the overall strategy of Endesa, from the experience of promoting smart grid development, and the implementation and dissemination of comprehensive service solutions in energy efficiency that contribute to improving the energy consumption of its clients without compromising the quality standards and competitiveness of its services, places us in a position of leadership in the new energy model that will radically change the way we manage the grid and also our relationship with clients.

At Endesa we are confident that the dissemination of the business practices in energy efficiency presented here will contribute to the advancement of society and that these examples adopted by the Spanish business sector, taking advantage of the opportunity offered by new technologies, will help achieve a more responsible consumption and promote a new economic model which, while limiting the environmental impact, ensures the progress of societies and the economic returns of companies by generating new business opportunities and more efficient management of resources.

Borja Prado
President of the Project
Chairman of Endesa
Introduction

Growing concerns about the environmental situation and the effects of climate change have led countries and international organizations to focus their attention on sustainability-based development models.

In this context, the United Nations General Assembly proclaimed 2012 the International Year of Sustainable Energy for All, with the firm conviction that it would be an engine to drive this new model as well as for the achievement of the Millennium Development Goals.

In this respect, the European Commission estimates that a 20% reduction in energy consumption from the member states would save about 50,000 million Euros a year, reduce CO₂ emissions by 740 million tonnes and create more than two million jobs.

In the case of Spain, an investment of 137,391 million euro on the implementation and development of ICT could generate savings of 601,802 million euro for the period 2011 – 2020, including 47,639 million euro which come from energy savings, as reveals the Spain20.20 report drawn up by Club de Excelencia en Sostenibilidad.

For this it is essential for governments and businesses to work together to promote public policies and strategies that encourage the use of cleaner energy and better use of fossil fuels. The role of business is crucial in achieving this goal, either by promoting the access of people to this type of energy or by optimizing their internal processes through self-sufficiency with renewable energy or by adopting energy efficiency measures.
Consequently, the Best Practices Catalogue in Energy Efficiency highlights the good practices being carried out in this area by 44 companies from various business sectors operating in Spain, including SMEs and public sector institutions.

Good practices in energy efficiency have been segmented into six main sections, depending on their major area of influence, namely: Climate Change, Green Public Procurement, Dialogue with Stakeholders, Eco-design and Technological Innovation, Infrastructure, and Measurement and Control.

To guide and facilitate the reading of the Catalogue, an overview of each company is given including the business sector, the number of employees and, in some cases, the contact person, as well as specific information relevant to the practice itself: goals for the reduction of energy consumption, emissions and costs; financial resources used and hours spent; implementation site; stakeholders taken into account; and detailed description of the practice.
contra introduction
Climate Change
contra separador
ENERGY SAVING IN WATER UTILITIES

SECTOR ENGINEERING

NUMBER OF EMPLOYEES
3,500

WEBSITE
www.abb.es

CONTACT
Albert Ginestà, Energy Efficiency Manager
Drives&Motors&PLC’s
albert.ginesta@es.abb.com

LOCATION
Vallés Area, Barcelona (Spain)

STAKEHOLDERS
Employees, suppliers

RESOURCES
Financial: approximately 150,000 €
Time: 60 hours

AIMS
- To achieve the highest possible savings while maintaining the need for supply at all times
- Return on investment in less than one year

TAGS
savings plans, mitigating climate change
**ABB works with large centrifugal pumps** to supply towns with the demand of drinking water. These pumps work at 100% capacity but with oversized engines, so the company intends to find the balance point that allows saving and at the same time meeting the water supply demand, which is achieved by slowing down the engine speed with a frequency converter.

**Having a pump** or fan working at 100% capacity does not mean that there is no scope for savings; these appliances are often oversized and with a slight variation of the speed you can maintain the demand of the system and save considerably on costs, energy and CO₂ emissions.

**Thus, with an investment** of 150,000 € for the acquisition and installation of each frequency converter, the company gains a return amounting to 160,000 €/year. In addition, there are energy savings of 1,400,000 kWh/year and a reduction in emissions of 757 t CO₂/year.

"ENERGY SAVINGS AMOUNT TO 1,400,000 kWh/YEAR AND A EMISSIONS REDUCTION OF 757 T CO₂/YEAR"
FEASIBILITY STUDY OF 100% ELECTRIC VEHICLES AT AENA AIRPORTS

NUMBER OF EMPLOYEES
8,689

WEBSITE
www.aena-aeropuertos.es

CONTACT
Ferran Balcells, Head of Renewable Energy and Energy Efficiency Division
fbalcells@aena.es
Ana B. Margalef, Head of Energy Efficiency Department
abmargalef@aena.es

LOCATION
Airports of Madrid – Barajas, Barcelona – El Prat, Palma de Mallorca and Lanzarote (Spain)

STAKEHOLDERS
Renewable Energy and Energy Efficiency Division; Energy, Environment and Engineering and Maintenance Areas of the various airports, employees in general

RESOURCES
- Financial: 1.15 million €
- Time: three years

MAIN AIM
Check compatibility of using 100% electric vehicles with airport operation requirements, specifically assessing:
- Autonomy, compatibility of usage cycles with charging cycles and times, battery life and degradation
- Environmental and energy efficiency aspects
- Operating and maintenance costs
- Total reduction of local emissions arising from this activity

TAGS
Sustainable mobility, improving air quality

SECTOR
AIRPORT OPERATION
Aena Airports provides 33 electric-powered vehicles and their charging infrastructure at the airports Madrid - Barajas, Barcelona - El Prat, Palma de Mallorca and Lanzarote. To track the distances the vehicles cover, their consumption, battery changes and a number of other parameters to provide reliable data on the suitability of implementing electric mobility in the remaining airports, a system for collecting and recording energy and motion parameters is included which is distributed between the cars and the charging points. The electric vehicles are used in the same way as their conventional counterparts and are driven by the same staff.

In the absence of energy verification and battery development data, the result of usage is clearly positive: autonomy, performance and charging times are satisfactory; driving comfort is higher than in cars with thermal engine, which leads to their acceptance by drivers. Environmental respect, related particularly to the disappearance of local NOX and CO2 emissions, is linked to an improvement in the working conditions of the airport staff.

“The disappearance of polluting emissions leads to an improvement of the staff working conditions”
SUSTAINABLE MOBILITY AND TRANSPORT PROGRAMME

NUMBER OF EMPLOYEES
2,400

WEBSITE
www.cuidamoslonatural.com;
www.lechepascual.com

CONTACT
Mónica Peña, Sustainability Plan Coordinator
monica.pena@lechepascual.com
Oscar Hernández, Director of Sustainability and Corporate Affairs
oscar.hernandez@lechepascual.com

LOCATION
Spain, with special emphasis on Madrid, Barcelona, Sevilla and Valencia

STAKEHOLDERS
Public administration, suppliers, clients, environment committees of trade associations, employees, consumers

RESOURCES
- Financial: personnel costs of 41,000 €/year; remaining investment of 10,039,600 €
- Time: 1,790 hours/year

MAIN AIM
- To be the first company in the food sector with distribution and marketing vehicles powered by alternative energy

SPECIFIC AIMS
- To reduce environmental impact and noise pollution
- To reduce operating costs arising from fuel consumption (5% less) and optimize routes
- Respond to clients, suppliers and other interested parties

TAGS
Sustainable mobility, improving air quality

SECTOR
FOOD, BEVERAGES

18
CLIMATE CHANGE
The Sustainable Mobility and Transport Programme is part of the Environmental Sustainability Plan of the Grupo Leche Pascual. This is a cross-cutting Plan, integrated in the business strategy and based on the EU 2020 Strategy.

This programme involves mainly the progressive renewal of the distribution and marketing fleet with less polluting vehicles; concluding voluntary agreements with public administrations, associations and clients; the promotion of sustainable mobility among employees and the use of new technology.

Specifically, a total of 550 short-haul hybrid vehicles are acquired for the 100% renewal of the commercial network fleet, 25% of diesel lorries are replaced by lorries powered by alternative energy (LPG, natural gas, electric) in the goods delivery fleet and 20% in the logistics and distribution fleet by long-distance EEVs-Enhanced Environmentally-friendly Vehicles, to which a vehicle powered by compressed natural gas is added.

Voluntary agreements are made with the city council of Madrid, Proclima Forum commitment, for the replacement of 6% of the fleet by less polluting vehicles before 2012, reaching 13%; with the city council of Barcelona, Agenda 21; with the Confederación de Cascos Históricos de España-COCAHI-¹, for the supply with sustainable transport in the Barrio de las Letras² in Madrid; and with clients, for the supply with sustainable vehicles, such as the agreement with Unibail Rodamco.

To promote sustainable mobility among employees (pilot test in the Barajas Delegation) actions are taken to promote the use of car pooling or public transport to get to work; reconciliation measures are used and trade routes are allocated by proximity to the home and the overnight stay of vehicles on the premises is permitted.

In addition, e-commerce is ventured into through the www.clienline.es platform and routing software is installed to optimize mileage and vehicle load.

Through this project a 23% reduction in emissions and 17% energy savings are achieved. These data are calculated on the basis of the reduction in fuel consumption by fleet renewal.

Intangible benefits
An improved corporate image, reputation and better relations with authorities, clients, consumers, employees, associations, NGOs and other interested parties. In addition to an increased visibility due to repercussions and coverage in the media.

New business opportunities and facilities to carry out the distribution with the sustainable vehicle fleet in cities.

Stronger commitment to social responsibility due to the measures to reconcile work and private life and the lower impact on the environment.

Lessons learned
Environmental problems can be turned into business opportunities and greater competitive advantages. Studies can be carried out on new projects of goods distribution in cities based on the distribution models in “clean” European cities. For this purpose it is also important to make the program known in the forums in order to exchange experiences with other companies.

¹ Confederation of Historic Old Towns of Spain
² A district of Madrid
SUSTAINABILITY PLAN 2010-2015

SECTOR ENGINEERING

NUMBER OF EMPLOYEES
252

WEBSITE
www.lks.es

CONTACT
Lander Jiménez, Sustainability Coordinator
ljiménez@lksingenieria.es

LOCATION
Five offices in the Basque Country and Navarra (Spain)

STAKEHOLDERS
Innovation Committee, Ecogroups / Ekotaldes, expert panels in Energy Efficiency, Planning, Infrastructure and Architecture

RESOURCES
- Financial: 220,000 €
- Time: 4,400 hours invested + 27,500 hours in sustainability services billed

MAIN AIM
- To be leaders in ecodesign, energy efficiency and sustainable construction
- To reduce emissions and environmental impact, being committed to becoming a company with a CO₂ emissions balance amounting to zero

SPECIFIC AIMS
- To save energy and reduce CO₂ emissions by 30% until 2015

TAGS
Carbon footprint
The Sustainability Plan of LKS Ingeniería aims to implement a mechanism for the control and monitoring of indicators of the environmental impact arising from the service. Environmental impact has an implicit cost in the service of the company, so its reduction leads to economic savings and improved service efficiency.

The cost savings, implicit in reducing the impact, comprise the budget for the development of new services for the new green economy, so the plan is coordinated with the Innovation Plan for the development of new businesses which provide service in these new markets.

While new businesses are tracked for fundraising, billing and operating account, in the area of environmental impact reduction, the economic objective is linked to several factors that are unified under the concept of ecological footprint. LKS takes the measure of CO2 emission equivalent to (Kg CO2e) as unit to unify all indicators. Thus, the Sustainability Plan has two mechanisms: an internal one, for emission reduction, and an external one, for the development of products based on the cost savings generated by the first. Therefore the Plan sets targets for the reduction of Kg CO2/person/year, with the goal of reducing emissions by up to 30% by 2015, and it undertakes to compensate for what has not been reduced.

In terms of energy savings, it launches awareness campaigns among its employees in order to reduce consumption by 10% in the first year of the Plan (225 kWh/person/year) and, thereafter, gradually increase the reduction up to 30% by 2015.

After the first two years of the implementation of the Plan, the company manages to exceed expectations to date with energy savings of 344 kWh/person/year and an emissions reduction of more than 20% kg CO2/person/year.

In addition, the new services for the new green economy are showing a significant upward trend. The turnover of projects with environmental elements, such as consultancy, building or sustainable certification, increased from 10% in 2008 to 30% in 2011.

Intangible benefits
Currently the markets are more demanding, this cross-cutting dynamic allows LKS to unify its services and give them a comprehensive response. Furthermore, the experience in sustainable services is a key differentiator in the process of internationalization of the company. It manages to involve the entire organization in the process of generating new services and in the innovation of ways to reduce emissions. The teams involved and the rest of the organization are proud to be part of a socially and environmentally responsible business project.

Lessons learned
The addition of the environmental dimension to the aims of the company requires a diligent and disciplined commitment to sustainable development. This goes beyond the professional level since it involves a major commitment by all employees, but in turn, performing this exercise with the rigour it deserves opens the doors to collective creativity and enthusiasm to tackle challenges with shared values.
Biomass Project

Number of Employees
1,254

Website
www.torres.es

Contact
Luis Anselmo, Project and Services Manager
prensa@torres.es

Location
Pacs del Penedès, Barcelona (Spain)

Stakeholders
Employees

Resources:
- Time: 3 full-time employees for 6 months

Main Aim
- To reduce the carbon footprint in the energy consumption of our winemaking processes

Specific Aims
- Cost savings: 188,150 €/year This figure is calculated on the basis of three factors:
  1. Annual cost of natural gas, 39.5 € x MWht
  2. 85% output of the boiler
  3. 90% Net Calorific Value –NCV
- Energy savings: reduction of 5,000 MWht of natural gas + 1,000 MWht of electricity
- Emission reduction: 1,300 t CO₂/year

Tags:
Waste management, carbon footprint

Sector: Food, Beverages
The Miguel Torres winery group seeks to reduce its carbon footprint in energy consumption for which purpose it launches a biomass project involving the installation of a steam boiler with an output of 2,628 kW.

The energy source that feeds the boiler are the pruning waste of the vine itself, felling waste, the residue resulting from the pressing of the grape and crop leftovers. A 2,000 kW double-effect absorption cooling unit will also be installed.

The calculations estimate that 3,000 tonnes of vegetable waste can meet the 5,000 MWh of dealcoholization consumed during the process and the 4,000 MWh of cooling consumed between the months of April to November (especially during harvest time).

Due to the recent implementation of this project there are not yet any quantifiable results.

“ENERGY COMES FROM THE WASTE GENERATED BY THE ACTIVITY ITSELF”
TRANSFORMING WASTEWATER INTO BIOGAS FOR INTERNAL CONSUMPTION

NUMBER OF EMPLOYEES
5,000

WEBSITE
www.pepsico.es

CONTACT
João Nobre da Costa, Head of Environmental Sustainability
Marta Puyuelo, Head of External Relations and Corporate Communications
iberia.pepsico@pepsico.com

LOCATION
Carregado (Portugal)

STAKEHOLDERS
Employees, institutions

RESOURCES
- Financial: 50 million €
- Time: 2 years

MAIN AIM
- To improve efficiency in water and electricity use by 20% and in fuel use by 25%

SPECIFIC AIMS
- Cost savings: over 120 million €/year
- Energy savings: 2.3 GWh
- Emission reduction: 32,700 t CO₂/year

TAGS
Waste management, solutions for reducing energy consumption in buildings, savings plans

SECTOR
FOOD, BEVERAGES
In 2010, PepsiCo published a number of specific global aims to guide its activities until 2015. In the environmental area, the company undertakes to improve the efficiency of water and electricity use by 20% and of fuel use by 25%.

Within this framework, at its Carregado plant, in Portugal, the company is carrying out a project for the production of biogas from the organic load of the wastewater from the treatment plant, which is then used to heat the reactor and for internal consumption. This initiative will help to achieve the target set for 2015 and will serve as a pilot project for the subsequent implementation in other plants of the group.

The Carregado plant in Portugal is one of PepsiCo’s eight production centres on the Iberian Peninsula and a benchmark for PepsiCo in Europe in terms of sustainability. The plant engages in the production of crisps and snack products of the brands Ruffles, Lay’s and Cheetos, etc.

Through this project, the factory manages to close the cycle: the wastewater with organic load produced in the process of preparing crisps is reused and biogas is generated to be used again as fuel for frying potatoes instead of natural gas.

To carry out this project, it has been necessary to invest in a technology that replaces the aerobic process with an anaerobic process. The application of anaerobic treatment also aims to achieve a 50% reduction in electricity consumption in the sewage treatment plant and a 75% reduction in the costs associated with the sludge produced.

“ANNUAL COST SAVINGS OF OVER 120 MILLION € ARE ESTIMATED”

Lessons learned
For maximum efficiency of the project in the short term, it has been important to ensure the operating temperature of the reactor and inoculate quality sludge in the starting phase. Biogas production is maximized according to the variety of organic by-products that can be introduced into the treatment process and which is supported by technology, with special attention to the limits of oil, fats and solids in suspension.

Additional information
This project is part of the Environmental Sustainability policies of PepsiCo, included in its philosophy of Results with Responsibility. PepsiCo Iberia is considered to be a European benchmark in energy efficiency and reduction of water consumption. So much so that its crisp and snack plants in Burgos and Portugal have reduced water consumption by over 30%, exceeding the overall target set on a global level by the company for 2015.

However, this new system will involve the production of biogas equivalent to 5% of the natural gas consumption of the factory. Furthermore, depending on the wastewater temperature, up to 5% of the biogas production can be used to heat the reactor. Thus, the industrial unit will consume 5% less than the amount of natural gas currently consumed.

It is also expected that the reduction in CO2 emissions will be 32,700 t CO2/year, which would avoid the annual purchase of carbon credits amounting to 400,000 €.
DIRECT USE OF NATURAL GAS TO REDUCE ENERGY CONSUMPTION

SECTOR AERONAUTICS, AUTOMOTIVE, MOTORWAYS

NUMBER OF EMPLOYEES
8,600

WEBSITE
www.renault.es

CONTACT
Ernesto Salas, Public Affairs Director

LOCATION
Paint Building in Palencia (Spain)

STAKEHOLDERS
Industrial sector, maintenance sector

RESOURCES
- Financial: 463,000 €

MAIN AIM
- To optimize the energy consumption of the line for applying primer to the vehicle for the elimination of the last consumer of process dependent on superheated water

SPECIFIC AIMS
- Cost savings: 373,000 €
- Energy savings: 9,000,000 kWh
- Emission reduction: 1,360 t of CO₂

TAGS
Solutions for reducing energy consumption in buildings, carbon footprint, technological innovation
In this project, two old air-conditioning units supplying the cabin with air for the application of primer to vehicles, which used superheated water (SHW) for heat input, are replaced by other more modern ones using natural gas as energy burned directly in air stream, which leads to a significant improvement in energy efficiency.

Besides the improvement in energy consumption that the direct use of gas offers as regards the losses of a centralized SHW production and its distribution network, this project has overcome the need to keep the large SHW production boilers of the thermal plant in operation in the warmer months, thus obtaining higher energy gains and avoiding maintenance and operating at such times.

Specifically, the energy savings achieved are 9,500,000 kWh/year, the reduction in CO₂ emissions is 1,430 t/year and the cost savings are 390,000 €/year.

Lessons learned
Whenever possible we must find the most efficient energy source and avoid using transformed energies. In our case, instead of burning natural gas in a centralized thermal production and then transporting this energy in the form of superheated water and using it in the equipment, the gas is burned directly in the equipment and, being in direct combustion in air stream, even the water vapour enthalpy generated in the combustion is used.

Additional information
The direct use of gas is a common technique which is currently applied in industry in the installation of new equipment. However, with the current conditions, even the renewal of facilities for energy efficiency reasons allows acceptable profitability in many cases.

“WHENEVER POSSIBLE WE MUST FIND THE MOST EFFICIENT ENERGY SOURCE AND AVOID USING TRANSFORMED ENERGIES”
PLAZA DEL MILENIO IN VALLADOLID, GBC SPAIN GREEN CERTIFICATE

NUMBER OF EMPLOYEES: 20,000
WEBSITE: www.gruposyv.com
CONTACT: Hernán San Pedro, Head of Investor Relations & Corporate Responsibility

LOCATION: Plaza del Milenio, Valladolid (Spain)
STAKEHOLDERS: City of Valladolid, Green Building Council Spain (GBCe), employees, society

MAIN AIM:
- To limit the energy cost of materials used in construction, reduce the energy required for use and produce as much as possible in a clean way
- To ensure the second life of building components and recycle the majority of modular units
- To increase biodiversity and dialogue with the local community
- To use bio-architectural criteria

SPECIFIC AIMS:
- Energy savings: 10,000 kWh/year
- Emission reduction: 6 t CO₂/year

TAGS: Carbon footprint, solutions for reducing energy consumption in buildings
Sacyr carries out the spatial organization of the square Plaza del Milenio in Valladolid and park Parque de la Ribera, the redesign of the bridge Puente de Isabel La Católica and the construction of underground parking for 400 vehicles. It also implements the Millennium Dome as a multipurpose hall.

For this purpose, it takes into account the strictest criteria of constructive sustainability from the outset of the project. As a premise, it reuses the metal structure of the hall and the concrete structure of the bridge; mainly locally produced materials are used; gravel from excavation is reused; native species with low water consumption and low maintenance are planted; rainwater is used and natural runoff is not altered; biodiversity is increased by planting trees at the square and the riverbanks and the river are integrated into the city, creating a space for citizens to meet and interact.

In terms of energy, the energy cost of the materials used in construction is limited, as much of possible of the energy needed for the implementation of the project is produced in a clean way and the energy required for use is decreased.

“ELECTRICITY DEMAND IS REDUCED BY 50%”

Specifically, we manage to reduce the electricity demand of the underground parking by 56% and of the remaining facilities by 51% (square, riverside, dome). The same is true of the treated water, achieving savings of 89.3% in the underground parking, 64% at the dome, 99.1% in the dome, and 100% in the irrigation of the plot.

Thus, the total energy savings achieved are 17,319 kWh/year and the reduction in CO2 emissions is 9.69 t/year.

Today, the Plaza del Milenio project has the following distinctions in sustainability:
- 1st ABC-SANDO Sustainable Construction Award (1st prize)
- 5 GREEN LEAVES Certification in sustainable construction, from Green Building Council Spain - GBCe (highest rating)

It also has other distinctions, namely: City.People.Light Award 2011 for Best World Urban Lighting Project (1st Prize); Planning and Marketing Award 2011 for the Best Urban Development Project (1st Prize); XI Spanish Biennial Award of Architecture and Town Planning (selected project); Segovia Aqueduct Award for Best Practices in Tourism and Heritage (1st prize); Illuminating Engineering Society Awards of Merit 2012 (honourable mention) and Award to Valladolid as City of Science and Innovation for the Plaza del Milenio project.

Lessons learned
With the involvement of all agents who participate in the development of a project and a work, and the related effort, it is possible to minimize the environmental impacts and effects associated with a construction project.
contra ficha Sacyr
Green public procurement
contra separador
ADAPTATION OF THE LIGHTING OF ALCORCÓN TO THE NEW ENERGY EFFICIENCY REGULATIONS FOR OUTDOOR LIGHTING INSTALLATIONS

NÚMERO DE EMPLEADOS
1,700

WEBSITE
www.ayto-alcorcon.es

CONTACT
Susana Mozo, Councillor for Environment, Parks and Gardens

LOCATION
Municipality of Alcorcón (Spain)

STAKEHOLDERS
Public administrations, IDAE, energy service companies, society

RESOURCES
- Financial: investment by Energy Service Companies of 3,586,488 €; annual contract price of 1,500,993 €; initial audit of 80,000 €
- Time: 2,000 hours

MAIN AIM
- To promote energy savings in street lighting in the municipality by adapting it to the new energy efficiency regulations for outdoor lighting installations

SPECIFIC AIMS
- Cost savings: approximately 600,000 €/year
- Energy savings: 35%, equivalent to 3,000,000 kWh/year
- Emission reduction: 35%, equivalent to 930 t CO2/year

TAGS
green public procurement, rehabilitation and fitting-out of installations
Street lighting in Alcorcón was heterogeneous, areas with old and inefficient lighting coexisted with other more recently remodelled areas.

The proposed action consists of three phases: 1. Carrying out an energy audit to identify all necessary investments 2. Put out the implementation and operation of the lighting to tender for 10 years to allow amortization 3. Running the project and operating the lighting.

For this process, the involvement of the following agents is considered appropriate: the City Council, which obtains the short-term implementation of investments and which will benefit from the resulting savings in energy bills; the IDAE, which provides its expertise and finances the investment and the energy service company, which carries out the investments and will operate the lighting for the next 10 years.

The actions taken include measures for replacing old lights with other more efficient ones, reducing the brightness to meet the requirements of the new regulations on energy efficiency, remote management of the system, etc.

Since its launch, the project has only been running for one year of the 10 years planned, but cost and energy savings up to 40% are expected to be reflected in electricity bills.

Intangible benefits
Promotion of economic activity, improved corporate image and reduced light pollution.

Lessons learned
The initial energy audit should be as comprehensive as possible in order to carry out the whole procurement and operating process with the maximum possible guarantees.
It is important that all activities are carried out in coordination with representatives of all departments involved: planning, maintenance, parks and gardens, etc.

“COST AND ENERGY SAVINGS UP TO 40% ARE EXPECTED TO BE REFLECTED IN ELECTRICITY BILLS”
EFFICIENT STREET LIGHTING SERVICE AS MODEL OF PUBLIC-PRIVATE COOPERATION

NUMBER OF EMPLOYEES
150

WEBSITE
www.bollullosdelamitacion.es

CONTACT
Sergio Cano, Delegation of Municipal Maintenance, Sustainability and Personnel

LOCATION
Bollullos de la Mitación, Seville (Spain)

STAKEHOLDERS
Public authorities, energy service companies, society

RESOURCES
- Financial: 2,046,676 €

MAIN AIM
- To optimize the system and quality of municipal street lighting, implemented by Endesa at no additional cost to the City Council, by applying new technologies, improving the quality and efficiency of lighting, reducing energy consumption costs, optimizing maintenance and operation and minimizing CO2 emissions

SPECIFIC AIMS
- Economic savings: 43% reduction in electricity bills
- Energy savings: 540,000 kWh/year
- Emission reduction: 146 t CO2/year

TAGS
Green public procurement, savings plans

SECTOR
PUBLIC ADMINISTRATION
The project consists of replacing the street lighting system of the municipality of Bollullos de la Mitación by more efficient technologies that achieve major reductions in electricity consumption, with no need for investments by the City Council, so that these savings finance the necessary investment.

Enel Sole and Endesa carry out the replacement project dealing with the management of the supply invoices and adapt them to the lowest bid, and they manage the maintenance of municipal lighting during a 10-year concession.

The benefits which the municipality obtains are various. The most obvious one is that its lighting is renewed without having to invest anything or get funding. Another of the most striking benefits is the cost saving since a lower monthly payment than that existing before the concession is guaranteed and this payment is fixed, thus, avoiding surprises and enabling it to plan the service budget easily.

There is also a substantial reduction in the effort and resources required to manage the service and the various supply bills, one for each electrical panel of the installation. Finally, light pollution is reduced and the energy efficiency of the City Council is increased.

Initial goals are fully achieved. Thus, electric bill savings are 43%, energy savings are 540,000 kWh/year and the reduction in CO2 emissions is 146 t/year.

Currently, Enel Sole and Endesa apply the same model in the municipalities of Castro del Río and Muro de Alcoy; they are the companies with the most ESE projects in Efficient Street Lighting in Spain.

Intangible benefits

• Improvement of the environment for citizens due to the reduction of pollutant emissions, reduced diffuse and intrusive light, increased security, increased attractiveness of the city and improved level of service and user satisfaction.

• Opportunity for the municipality to be a leader in innovation and a test centre for outdoor lighting system technologies, since Endesa continues to implement a number of improvements designed to evaluate and verify certain technology solutions in public lighting installations. Specifically, they are trying remote management solutions for light sources, which are monitored from the Smart Grid Service Centre; furthermore they are making tests regarding ornamental lighting adjustments.

• Two-way communication with the public: the service includes a public service channel through the twitter profile, @APBollullos, by which citizens can inform about any service incidents, make suggestions, queries, etc. It is also used as a platform to provide information on energy efficiency measures in general and on the project in Bollullos, in particular.

• Promotion of new sectors such as the production of efficient lighting, energy audit companies, etc.

• Job stability linked to long-term concessions and support at a local and rural level for the employees of the maintenance companies.

Lessons learned

• Information on the installations of the municipalities is outdated. It is necessary to perform a thorough quality audit prior to the projects.

• The projects can be repeated in many municipalities so it is important to spread and promote the advantages of this model.
ENERGY EFFICIENCY IMPROVEMENTS IN SABADELL: INVESTMENTS AND GOOD HABITS AIMED AT SUSTAINABILITY AND COST SAVINGS

SECTOR PUBLIC ADMINISTRATION

NUMBER OF EMPLOYEES
1,500

WEBSITE
www.sabadell.cat

CONTACT
Cristóbal Guillén, Energy Efficiency

LOCATION
Sabadell (Spain)

STAKEHOLDERS
Public authorities, energy service companies, society

RESOURCES
- Financial: 9,205,721 €

MAIN AIM
- To reduce energy costs by, among other measures, installing 8,500 LED units

SPECIFIC AIMS
- Cost savings: 1,694,105 €/year
- Energy savings: 11,169,148 kWh/year
- Emission reduction: 2,560,974 kg CO2/ year

TAGS
Green public procurement, savings plans
In accordance with the sustainability goals set forward by the Local Agenda 21+10, the municipal strategy for the mitigation of Climate Change 2008-2012 and the Local Energy Office in the period 2009-2012 adopt measures for energy saving in municipal facilities and public spaces (lighting, fountains, etc.).

In addition to reductions in energy consumption and greenhouse gas emissions, the taken measures allow significant savings (1 million Euros per year) in a macroeconomic context characterized by the decreased revenues of the municipalities. These measures include optimizing the schedule at which street lighting and fountains are turned on and off, the installation of LED optics in 100% of traffic lights and the remote radio management of 32 lights.

With regard to the new contract between the City Council of Sabadell and the Energy Service Company for street lighting, in effect for the 2013-2022 period, the contractor must undertake a significant amount of energy saving investments which will be financed by the savings themselves.

Specifically, the project reduces the annual energy bill over this period by 30% on average, equivalent to 600,000 € a year. Investments involve, among others, the replacement of all existing lights with new LED lighting (8,500 units), and the increase of the number of panels with remote management or remote reading during 2012 and 2013.

All the measures are developed progressively; those already implemented produce annual savings of 834,793 €, this figure is expected to rise to 1,694,105 €. Meanwhile, the annual energy savings achieved today are 6,489,148 kWh and these are expected to increase to 11,169,148 kWh. Finally, the annual reduction in emissions stands at 1,713,974 kg CO2 and is estimated to increase to 2,560,974 kg CO2.

Intangible benefits
Awareness and training of citizens and municipal staff in good energy habits. Change of the traditional idea that ecology and sustainability are a burden on the economy by showing that, on the contrary, they promote cost savings and innovation.

Lessons learned
In a difficult economic context for public authorities such as the present, it has been shown that investment can be maintained as long as it focuses on reducing long-term expenditures. That is, short-term spending is offset by long-term savings. In addition, these investments in energy efficiency enable the prediction and prevention of negative consequences for the municipal budget as regards the expected future increase in energy prices.
## OUTSOURCING OF OUTDOOR LIGHTING TO AN ENERGY SERVICE COMPANY

<table>
<thead>
<tr>
<th>SECTOR</th>
<th>PUBLIC ADMINISTRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER OF EMPLOYEES</td>
<td>100</td>
</tr>
<tr>
<td>WEBSITE</td>
<td><a href="http://www.ayto-sotodelreal.es">www.ayto-sotodelreal.es</a></td>
</tr>
<tr>
<td>CONTACT</td>
<td>José Gismero, Energy Efficiency Councillor</td>
</tr>
<tr>
<td>LOCATION</td>
<td>Soto del Real (Spain)</td>
</tr>
<tr>
<td>STAKEHOLDERS</td>
<td>Public administrations, IDAE, Spanish Lighting Committee, energy service companies, society</td>
</tr>
<tr>
<td>RESOURCES</td>
<td>- Financial: 2,032,148 €</td>
</tr>
<tr>
<td>MAIN AIM</td>
<td>- To adapt outdoor lighting installations to the new energy efficiency requirements set forward in REEIAE-08</td>
</tr>
<tr>
<td>SPECIFIC AIMS</td>
<td>- Cost savings: 245,400 € (City Council 47,000 €; for financing the investment 198,400 €)</td>
</tr>
<tr>
<td></td>
<td>- Energy savings: 1,577,892 kWh/year</td>
</tr>
<tr>
<td></td>
<td>- Emission reduction: 1.024 t CO₂</td>
</tr>
<tr>
<td>TAGS</td>
<td>Green public procurement, rehabilitation and fitting-out of installations</td>
</tr>
</tbody>
</table>
The municipality of Soto del Real allocated 242,000 € to street lighting power supply and 196,000 € to its maintenance which amounted to a total of 438,000 € a year.

For improved efficiency in outdoor lighting, the City Council put it out to tender specifying that the contractor must make an investment in the renewal of lighting installations and their adaptation to the regulations. Thus, the selected project proposes a number of energy efficiency improvement measures which lead to energy consumption savings of 80%, thanks to which the investment of 2,032,148 € made by the energy service company is financed and the city council achieves a reduction of 47,000 € (10.7%) in the annual fee it has to pay.

The measures taken were mainly the replacement of the 3,277 lights with LED technology; the improvement of the command centres and distribution lines; point-to-point regulation; the addition of a double level that reduces power by 50% at 1:00 am; the installation of a consumption control system (EMMOS) and an installation management and control system for inventories (ONVIA Lighting), among other measures. Thus, the municipality meets the initial aims of 1,577,892 kWh/year in energy savings and 1,024 t/year in CO2 emission reduction.

“80% SAVINGS IN THE ENERGY PREVIOUSLY CONSUMED”

Intangible benefits
With the new lighting system, in addition to the significant savings of 80% concerning the energy previously consumed, a crucial step has been taken for the implementation of energy service companies in Spain, proving the feasibility of the new procurement model of public-private partnerships in public administration and the introduction of LED lighting. From the citizens’ point of view, the quality of lighting has significantly improved, improving the uniformity and chromatic reproduction and furthermore, light pollution has almost been eliminated completely.

Lessons learned
We have verified the feasibility of this new business model thanks to the positive results that are being achieved. Thanks to the knowledge and experience of energy service companies, combined with the financing of investments, public authorities can implement projects that significantly improve energy efficiency and that help meeting national targets for reduction in demand and improvement in energy efficiency. ESCOs undoubtedly play an important role in this field. The Soto del Real project, launched by the IDAE and Spanish Lighting Committee, has been a success and serves as model for many other municipalities. Even the Massachusetts Institute of Technology is conducting a research project together with the company Ferroser, in collaboration with the Soto del Real City Council.
LIGHTING AUDIT, KEY FOR ADAPTATION OF STREET LIGHTING

SECTOR ENGINEERING (SME)

NUMBER OF EMPLOYEES
1 employee and 3 collaborators

WEBSITE
www.luminicaambiental.com

CONTACT
Susana Malón Giménez, Director
susana.malon@luminicaambiental.com

LOCATION
Municipalities of Pulpi in Almería and Segura de la Sierra in Jaén. Carried out for the autonomous region’s government Junta de Andalucía - Ministry of Environment (Spain)

STAKEHOLDERS
Public administrations, society

MAIN AIM
- To adapt outdoor lighting installations to the regulations for protection of the night sky from light pollution (Decree 257/2010) and the Energy Efficiency Regulations (Royal Decree 1890/2008) through the energy service method

TAGS
Green public procurement, light pollution reduction, savings plans
Lumínica Ambiental conducts a lighting audit in the municipalities of Pulpí and Segura de la Sierra as part of a pilot project carried out by the municipalities adhering to the Covenant of Mayors for Climate Change in Andalusia.

The light and energy audit has two aims. On the one hand, to specifically define the corrective measures necessary to adapt the installations to the required regulations and investment. This entails significant cost savings in the management of this public service and considerable environmental improvement by reducing light pollution and greenhouse gas emissions. On the other hand, it offers a thorough technical knowledge of the installation in order to ensure the viability of the service tender through an Energy Service Company (ESCO).

Thus, Lumínica Ambiental works on a total of 1,297 light sources and 18 control centres. The tasks they perform in the lighting audit are:

- Detailed inventory of the installations: collection and processing of the initial information, which is extended and updated to the actual situation. For this purpose, extensive fieldwork is carried out.
- Measurement of nocturnal light levels, using the mobile unit with three geo-referenced light meter probes and data management software to generate light data and maps and include them in a GIS (Geographic Information System) and compare different areas of lighting or the same area at different times, which will enable the monitoring of the operation and the performance of actions.
- Assessment of the current situation, comparing the item data and measurements obtained with current legislation. Actions are identified according to their priority for adaptation to the regulations.
- Technical and economic analysis of the solutions, supplying the necessary investment data, along with the expected savings and environmental improvements in relation to the reduction of light pollution.

Thanks to the improvements proposed by these audits, there will be estimated annual cost savings of 50,371 €, energy savings of 457,918 kWh/year and CO2 emission reductions of 212.12 t/year.

Lessons learned
This project allows us to corroborate that the light and energy audit is a fundamental prerequisite for the subsequent preparation of the specifications for the procurement of the street lighting service in the form of energy service, and for this to take place under conditions that ensure correct lighting service, proper functioning of lighting and maximum savings for the municipalities and fair economic conditions for the bidding companies.

The appropriate balance occurs only if the audit is done under independent criteria regarding external components and bearing in mind sustainable energy criteria to provide adequate lighting while ensuring the safety of users, reducing consumption by using the maximum energy efficiency and respecting the environmental quality of residential areas and reducing light pollution.

“LIGHT AND ENERGY AUDIT IS A FUNDAMENTAL PREREQUISITE FOR THE PROCUREMENT OF STREET LIGHTING SERVICE IN THE FORM OF ENERGY SERVICE”
contra ficha Lumínica Ambiental
Dialogue with Stakeholders
contra separador
## Alcampo

**Trained, informed and committed staff**

**Number of Employees**: 15,000

**Website**: www.alcampo.es

**Contact**
Antonio Chicón, CSR and External Communications Director
rsc@alcampo.es

**Location**
Alcampo’s large supermarkets (Spain)

**Stakeholders**
Employees, general public

**Resources**
- Financial: over 100,000 € (cost/hour not counted)
- Time: over 11,000 hours

**Main Aim**
- To raise the awareness and gain the commitment of employees to the company’s energy efficiency targets

**Specific Aims**
- Energy savings: 20% by 2020, equivalent to more than 58,000 MWh
- Emission reduction: 20% by 2020, equivalent to more than 14,000 t CO2eq

**Tags**
Staff commitment to energy efficiency targets
To achieve 20% savings of kWh/m² electricity by 2020 and, therefore, a 20% reduction of CO₂ emissions, Alcampo has launched an action plan ranging from the introduction of more efficient technical innovations to the improvement of management systems and the staff involvement.

Specifically, technical improvements such as LED illumination, efficient roof top air-conditioning with refrigerated recovery, closed refrigeration furniture, speed shifters, motion detectors, etc. are installed.

However the company acknowledges that the success of a 13% reduction in energy in 3 years is the result of the work and involvement of maintenance crews and employees in general, to whom the following activities were aimed:

1. Implementation of an e-learning training course about the importance of saving energy from an environmental and economic point of view, given to 70% of the workforce.
2. Internal communication campaign using the following tools: posters with general good habits, specific posters of the maintenance sector, identification stickers on light switches, intranet and internal newsletter.
3. Creation of an energy efficiency label to know the consumption in energy units (kWh) of each large supermarket; this information is part of a new indicator that is analysed every six months and which forms part of the system of aims.
4. Implementation of maintenance synergies: in each large supermarket, there is a maintenance team that has been directly involved, holding videoconferences twice a year for benchmarking, sharing the best methods and troubleshooting among the maintenance managers themselves.
5. Implementation of maintenance software to integrate all the know-how and share it online.

Finally, the result of all the actions is an energy saving of 35,300 MWh and an emission reduction of 8,700 t CO₂eq.

Intangible benefits
The external survey results reveal that 91% of our customers think that Alcampo is committed to the environment.

Lessons learned
Beyond technology and large investments, we believe that informed and trained people can achieve great savings and have a very positive impact on the environment. It is also a commitment that transfers the borders of the company; the people who have been passionately involved in the project are highly committed citizens.

“THE SUCCESS OF REDUCING ENERGY CONSUMPTION BY 13% IS THE RESULT OF THE STAFF INVOLVEMENT”
ENERGY MANAGEMENT
OF BANK BRANCHES

NUMBER OF EMPLOYEES
650

WEBSITE
www.es.issworld.com

CONTACT
Ana Jimeno, Quality and Environment Manager
ana.jimeno@es.issworld.com

LOCATION
Spain

STAKEHOLDERS
Clients, employees

RESOURCES
- Financial: 22,520 €
- Time: 450 hours

MAIN AIM
- To implement an energy management system in order to diagnose the measures to be taken and assess their environmental impact, bearing in mind that the final energy savings must support the investments and expenditure incurred

SPECIFIC AIMS
- Cost savings: 43,000 €
- Energy savings: 200,000 kWh
- Emission reduction: 107,200 kg CO₂

TAGS
Rehabilitation and fitting-out of installations: energy management system, savings plans, commitment of staff to energy efficiency goals
The energy consumption map of the properties is analysed, based on the obtained consumption, which allows us to implement the first diagnosed measures for saving.

Subsequently, a monitoring system is set up to control energy expenditure and several measures are applied that respond to the application of specific energy saving plans, such as:

- Change of lighting
- Change of the battery of condensors
- Change of cold production units
- Training and awareness campaigns for employees

So far, energy savings of 200,000 kWh, a reduction of 107,200 kg of CO2, and cost savings of 43,000 € have been achieved.

Intangible benefits

- Shared values with our clients, including environmental sustainability
- Enhance the brand image of our client
- More involvement of own employees

Lessons learned

To achieve energy savings targets, the training and awareness of users is essential. This implies a change in thinking of the latter, and therefore we must focus the training from a broader perspective than just the workplace. That is, by teaching them to apply best energy practices in the domestic environment, we achieve a better assimilation of these practices, which are then reflected in the work environment.

“USER’ AWARENESS IS ESSENTIAL TO ACHIEVE ENERGY SAVING TARGETS”
**ENERGY OPTIMIZATION OF THE COMPRESSED AIR SYSTEM IN AN ITP INDUSTRIAL PLANT**

**NUMBER OF EMPLOYEES**
2,807

**WEBSITE**
www.itp.es

**CONTACT**
Belén González, Head of Environment
belen.gonzalez@itp.es

**LOCATION**
Ajalvir, Madrid (Spain)

**STAKEHOLDERS**
Workers’ Committee, employees

**RESOURCES**
- Financial: 25,000 €
- In time: 100 hours

**MAIN AIM**
- To achieve energy savings in compressed air generation for use in the plant, thus improving the efficiency of this process

**SPECIFIC AIMS**
- Cost savings: 31,000 €
- Energy savings: 380,000 kWh/year, equivalent to 5% of annual consumption
- Emission reduction: 142 t CO₂

**TAGS**
Solutions for reducing energy consumption in buildings, staff commitment to energy efficiency goals
ITP considers the energy efficiency of the whole compressed air system of the plant and defines the savings target pursuing a dual optimization: firstly, reducing the electricity consumption which is necessary to generate compressed air, and secondly, using the heat energy generated in the compressor so that residual heat can be converted into useful heat.

For this purpose, the whole installation is analysed and actions are taken to improve various aspects:
- Compressor operation cycles are optimized, programming stops at night time and on weekends.
- Air leak detection tests are launched throughout the entire network and awareness campaigns on the proper use of compressed air are made, thus securing the involvement of staff in this improvement.
- Operating conditions are optimized, adjusting pressure to the needs of each job, depending on the task to be performed.
- A system is designed to recover heat from the compressor cooling system and use it for heating the buildings and warehouses near the compressor room. Previously, air quality controls are performed to ensure that the improvement takes place in optimal conditions for the well-being of workers and facilities.

By this method, savings of 45,500 € a year are achieved, 47% more than the initially stated goal and this means 50% of all cost savings achieved in the plant in 2011 by improving energy efficiency.

There are also savings from reducing preventive and corrective maintenance achieved by the optimization and reduction in operating hours of the compressors. Furthermore, by achieving a more linear electricity consumption graph, the financial penalties for exceeding the maximum contracted power consumption are reduced.

As regards energy saving, a reduction of 926,005 kWh is achieved, divided into 346,106 kWh of electricity and 579,899 kWh of heat. This means 5.1% of the electricity consumption and 8.34% of the natural gas consumption of the plant in 2010. And as for the reduction of emissions, a reduction of 244.2 t CO₂ is achieved, which corresponds to 6.2% of the emissions generated in 2010.

Intangible benefits
Awareness campaigns and staff participation have promoted the launch of new suggestions. The training on energy efficiency was highly appreciated by the participants, who suggested extending it to more employees, and as a result, work groups were created to identify actions to improve energy efficiency in different areas of the plant. These actions were assessed and some of them have been included in the new environmental management programme.

Lessons learned
Improved energy efficiency is higher if measures are defined focusing on different aspects: equipment and facilities, operation, saving, recovery, user actions, etc.
If workers are involved in the definition of improvements, their involvement in the implementation, maintenance and defence thereof is stronger. It also helps if the improvements carried out in the company can be applied at a personal and/or household level.
Many savings and efficiency concepts can be applied not only to different forms of energy but also to overall resource consumption. Investing in staff training and awareness leads to an improvement in other areas of the organization.

“INVESTING IN STAFF TRAINING AND AWARENESS LEADS TO AN IMPROVEMENT IN OTHER AREAS OF ORGANIZATION”
SOLUTIONS FOR REDUCING ENERGY CONSUMPTION IN THE SENER OFFICE BUILDINGS IN BILBAO, MADRID AND BARCELONA

SECTOR ENGINEERING

NUMBER OF EMPLOYEES
2,200

WEBSITE
www.sener.es

CONTACT
Ainhoa Veiga, Quality Coordinator and Head of Occupational Risks Prevention
ainhoa.veiga@sener.es

LOCATION
SENER office buildings in Bilbao, Madrid and Barcelona (Spain)

STAKEHOLDERS
Maintenance, general services, employees

RESOURCES
- Financial: approximately 20,000 €

MAIN AIM
- To gradually reduce energy consumption, mainly from lighting, to lower the expenses of the bill by 5 to 10%

TAGS
Solutions for reducing energy consumption in buildings, staff commitment to energy efficiency goals
In order to reduce energy consumption in the SENER office buildings, the company launches a plan of gradual modernization of electrical equipment for lighting, with elements of higher performance and efficiency.

To optimize this action, timers and presence detectors are placed in corridors and toilets. In addition, equipment is acquired for engineering and service processes with energy saving criteria, incorporating reduced power systems during periods of inactivity and using black screensavers with an action time of no more than five minutes.

At the same time, environmental education and awareness campaigns are conducted among employees with key messages, such as: turn off computers, lighting, air conditioning, screens, printers and plotters when they are not necessary and overnight, use screen energy savers, etc..

In the new infrastructure, as in the case of Tres Cantos and Barcelona, adjustable lighting is installed which turns on and off depending on exterior lighting, thus, reducing electricity consumption, emissions and costs. Due to the recent implementation of the project, there does not exist any quantifiable data, so far.

Intangible benefits
Awareness and involvement of staff in saving energy, not only in the offices in which they work but also at a personal and/or household level.

“STAFF AWARENESS IN ENERGY SAVING IS TRANSFERRED TO THE DOMESTIC SPHERE”
contra ficha Sener
Eco-design and Technological Innovation
contra separador
INCREASED EFFICIENCY AND REDUCED EMISSIONS IN CARS BY LIGHTENING A COMPONENT WITH INNOVATIVE SOLUTIONS

SECTOR AERONAUTICS, AUTOMOTIVE, MOTORWAYS

NUMBER OF EMPLOYEES
25,000

WEBSITE
www.gestamp.com

CONTACT
Iñaki Alapont, R&D Centre Manager
María Alonso, Occupational Risk Prevention, Environment and Corporate Responsibility
matunon@gestamp.com

LOCATION
Brackwede (Germany)

STAKEHOLDERS
Customers

RESOURCES
- Financial: 300,000 €
- Time: 4,000 hours

MAIN AIM
- To promote the reduction of vehicle emissions and fuel consumption by reducing their weight

SPECIFIC AIMS
- Cost savings: 25% reduction compared with aluminium solutions
- Energy savings: reduction in dependence on fuel of the vehicle during its lifetime due to weight reduction
- Reduction of CO₂ emissions: those associated with the 15% weight reduction of the solution

TAGS
Technological innovation, climate change mitigation
The weight of cars has a direct relationship with fuel consumption and emissions to the atmosphere. A 10% reduction in the weight of a 1,500 kg vehicle is estimated to lead to a reduction in emissions of 10–20 g CO₂/km. It is therefore very important for the parts of bodywork to be as light as possible, provided they meet the technical requirements and maintain a competitive cost position.

In this particular case, Gestamp has made a component of the front suspension, the lower control arm, which equips a platform shared by several utility models, lighter and less expensive than other solutions offered in cast or forged aluminium.

By the use of advanced high resistance steels, combined with the latest developments in simulation tools, a lighter, lower weight and cost solution is sought to help clients achieve their emission reduction targets.

The development takes place in cooperation with one of the main clients of the company, focused on one of its platforms with the greatest production volume.

So, after agreeing on the requirements that the solution must meet in terms of fixing points and attachments, maximum volumes, resistance, stiffness, fatigue life and impact resistance, an optimized solution is sought by using simulation tools.

The first results lead to a mono-shell solution with strong potential for reducing weight and cost, based on the use of the latest generation steels. Being very high strength steels, simulation tools are used to verify the feasibility of the initial geometry and ensure that it falls within the parameters set forth by the manufacturing technologies that are to be used (bodywork stamping, conventional welding). This leads to a repeated optimization process which concludes with a solution slightly below the initial objectives but very satisfactory.

The next step is to validate the solution through comprehensive testing of prototypes and verification of compliance with the requirements, allowing the release of the design and the start of mass production.

Although the aim of this project is not to save energy units during the production process of the part, it focuses on reducing the weight of the latter which has a direct impact on vehicle fuel dependence and the reduction of emissions during the lifetime of the product.

In this respect, a 12% reduction is achieved in the weight of the part compared to the aluminium solution and a reduction of 3,000 t of CO₂, on the assumption that a vehicle covers an average of 15,000 km per year, saving 15 g of CO₂ per kilometre and per each 120 kg weight reduction.

Lessons learned
One of the main lessons is the need for collaborative work when it comes to finding an optimized innovative solution; this includes, in this case, the client itself, the research team, process engineering team and tools area, welding and plant.

Developing innovative products that help car manufacturers meet their emission reduction targets, make us as to one of the leading suppliers in this sector.
SOLAR CAR PARK WITH A DUAL PURPOSE: ENERGY PRODUCTION AND PROVIDING ROOFS FOR EMPLOYEES’ CARS

NUMBER OF EMPLOYEES
12,000

WEBSITE
www.grupoantolin.com

CONTACT
Emma Antolin, Head of Corporate Social Responsibility
Cristina Sánchez, Corporate Improvement Area
rsc@grupoantolin.com

LOCATION
Antolin Group Headquarters in Burgos (Spain)

STAKEHOLDERS
General services, Corporate Innovation Management, employees

RESOURCES
- Financial: 2,200,000 €
- Time: 1,760 hours

MAIN AIM
- To implement renewable energy and reduce CO₂ emissions

SPECIFIC AIMS
- Cost savings: 250,000 €/year
- Energy savings: 500,000 kWh/year
- Emission reduction: 500 t CO₂/year

TAGS
Development and implementation of renewable energies, use of solar thermal or photovoltaic energy
In 2007, a study was conducted on the possibilities of implementing renewable energy in the Grupo Antolin; thus, identifying the opportunity to locate a solar energy park in the car park of the main building, as it disposes of the sufficient surface for this purpose.

Moreover, the project is designed with a dual purpose. On the one hand, to generate renewable energy and, on the other, to provide a roof for employees’ vehicles to be better protected.

Thus, different types of panels are studied finally opting for the BP Solar, which has a higher price but also a higher performance. An agreement is made with a local company for their installation.

Due to this project, the Grupo Antolin achieved a reduction in energy consumption of 608,827 kWh/year and a reduction in CO2 emissions of 700 t/year. The recovery of investment for this project will be achieved in nine years.

**Intangible benefits**
Internal image of commitment to the environment.

**Lessons learned**
Renewable energies have their place in many areas of the industry. This first project has led to further feasibility studies such as cogeneration.

“THIS PROJECT HAS LED TO FURTHER FEASIBILITY STUDIES SUCH AS COGENERATION”
ECO-DESIGN AND TECHNOLOGICAL INNOVATION

ZERO EMISSIONS SUPERMARKET

SECTOR DISTRIBUTION

NUMBER OF EMPLOYEES
40,000

WEBSITE
www.eroski.es

CONTACT
Gotzone Artabe, Head of Environment
gotzone_artabe@eroski.es

LOCATION
Oñate, Gipuzkoa (Spain)

STAKEHOLDERS
Customers, employees, suppliers, neighbourhood

RESOURCES
- Financial: 20% increase in investment, i.e. €500,000 compared with a standard centre

AIMS
- Energy savings: 65% compared with a standard centre, equivalent to 500 MWh/year
- Emission reduction: over 200 t CO₂/year

TAGS
Solutions for reducing energy consumption in buildings, eco-design, carbon footprint
Eroski aims to create the first Zero Store model, validated in real environment, which identifies the eco-efficient measures that in combination reduce the impact on the environment, i.e. reduction in energy demand by application of additional savings measures to the usual type of construction, the area of application being the main installations (lighting, industrial refrigeration and air-conditioning) and the facade of the building, taking into account the interaction between different systems and equipments.

In this "lab store" eco-efficient solutions are integrated and combined, providing it with a tool for the simulation and validation of the implemented measures and a system for the control and monitoring of savings per unit and for all solutions. Subsequently, eco-generation measures were integrated, the possible extension of these to the entire sales network being under consideration.

At the Zero Store, measures to reduce the impact of the centre on the environment, both through a reduction in energy consumption and through the implementation of sustainable construction measures, are tested and identified, ensuring that the implementation of these new developments is kept within sustainable economic parameters.

In accordance with the aforementioned information, once the investment has been recovered, cost savings of 50,000 €/year, energy savings of 520,000 kWh/year and a reduction in CO₂ emissions of 195 t/year are expected.

Through this initiative, the Grupo Eroski has become the first food retailer to integrate in a "lab store" eco-efficient technologies and construction which have never been used together before.

Intangible benefits
Besides achieving an unprecedented store due to the associated energy results, it has been possible to sensitize all the stakeholders involved, specifically by developing a training plan for the store team and by launching a customer education and awareness plan.

Lessons learned
The development of this store has allowed Eroski to verify that all phases of a project of this kind have a direct impact on the final result, the energy performance of the building and its use. It has been possible to considerably improve the sustainability of the "lab store" by the preconception of the model, the definition of the project or simply the choice of the location of the building.

Nevertheless, the results obtained encourage to continue working to improve the stores so that the impact of the activity through 100% sustainable stores can be mitigated.
SUSTAINABILITY IN THE BUILDING OF SHOPPING CENTRES

NUMBER OF EMPLOYEES: 8,000

WEBSITE
spain.leroymerlin.com

CONTACT
Ignacio Carrasco, Director of Technical Department; ignacio.carrasco@leroymerlin.es
Rodrigo De Salas, Director of Communications and CSR; rodrigo-javier.salas@leroymerlin.es

LOCATION
Gandia, Gijon, Cordoba, Elche, Sabadell, Albacete, Majadahonda, Valladolid, Orihuela (Spain)

STAKEHOLDERS
Customers and consumers, residents’ communities, collaborators, suppliers, distribution sector, technology sector

RESOURCES
- Financial: 525,000 €/store
- Time: 4,032 hours (technical team and suppliers assigned to the project)

MAIN AIM
- To develop high efficiency energy consumption and management projects in order to be leaders in sustainability in the construction and operation of shopping centres in Spain

SPECIFIC AIMS
- Cost savings: 105,320 €/year
- Energy savings: 798,115 kWh/year + 31,287 kWh/year of renewable energy production. The aim for the 2012-2016 period is to gradually reduce the ratio of consumption in kW/m² of interior sales area by 25% in comparison to 2010 data
- Emission reduction: 530.98 t CO₂/year

TAGS
Eco-design, solutions for reducing consumption in buildings, efficient resource management: measurement and control
Leroy Merlin proposes the comprehensive sustainable construction of its commercial buildings focusing on energy saving, consumption efficiency and energy management solutions in each one of them: EFV production plants; production of solar thermal hot water; improved insulation and thermal bridge ruptures; LED lighting and LED illuminated signs; heat recovery air-conditioning; Consumption Control and Energy Management Systems and waste management with separation at source.

The project started in 2009 with the preparation of a general programme of sustainability and efficiency measures by the Technical Department of Leroy Merlin and was later applied in the design and conception phase of each of the new stores by external technical offices assigned to each project, taking into account the specific characteristics of each one.

The validated standard is a living project under constant review, evaluating the new technology and efficiency solutions on the market. All innovations applied are subject to a cost benefit and economic viability analysis.

In the remaining Leroy Merlin stores, they are considering the gradual introduction of improvements in resource management and the replacement of equipment with more efficient equipment which will be carried out as the old equipments useful life ends.

Specifically, with regard to energy consumption, savings of 63% of the total are achieved in 29 of the 46 stores of the group, which means savings of 4.05% of the total electricity consumption in Leroy Merlin stores in Spain in 2011 and which is equivalent to 3,218,363 kWh saved. The cost savings in 2011 are 356,573 € and the reduction in CO2 emissions is 592 t.

Intangible benefits
Addressing the social demand for sustainability and environmental respect, which also improves our corporate reputation in this field. Pride of membership by the employees of Leroy Merlin, experiencing the values and business model of the company and strengthening the culture of continuous improvement.

Lessons learned
The development of sustainable construction starts at the beginning of the project with the design of the building to be constructed. Maximum energy efficiency is achieved in the design phase of the building.
SYSTEM FOR THE REGENERATION OF ENERGY FROM THE BRAKING OF TRAINS

NUMBER OF EMPLOYEES
760

WEBSITE
www.metrobilbao.com

CONTACT:
Luis Ramos, Head of Corporate Development
lramos@metrobilbao.net

LOCATION
Five electrical substations on the 2 lines of Metro Bilbao (Spain)

STAKEHOLDERS
Employees, users, society

RESOURCES
- Financial: 2,400,000 €
- Time: 2,500 hours (technological partner not included)

MAIN AIM
- To create reversible substations to return to the network the energy which is potentially recoverable but which is dissipated in the resistors

SPECIFIC AIMS
- Cost savings: 500,000 €/year
- Energy savings: 4,000,000 kWh
- Emission reduction: 7,031 mt (metric tonne) CO2/year

TAGS
Technological innovation, sustainable mobility

SECTOR TRANSPORT AND LOGISTICS
Trains accelerate and brake regularly. Each time a train accelerates, it stores kinetic energy which is released at the braking process. The kinetic energy of the train is converted into electrical energy by the traction engines and the associated converter. Thus, a braking train provides energy to the overhead power cable if another train is accelerating nearby at the same time. If this simultaneous timing condition is not met, the energy generated by the braking process would burn in the resistors located in the train for that purpose.

The development of Metro Bilbao is to create reversible substations which are capable of returning the energy that was previously burned in resistors, to the network since before the launch of this project the overhead power cable consisted of rectifier bridges with non-reversible energy flow. For this purpose, a unit is installed consisting of a converter connected between the overhead power cable and the secondary existing traction transformer, at the same time with the substation rectifier, to enable the return of surplus power from the overhead power cable. This design enables to maintain always the existing infrastructure at the substation (transformer, rectifier, switchgear and electrical protection). The basic equipment consists of:

- AC/DC inverter with elevator copper, which permits power to be returned to the network, reusing existing substation transformers
- Circuit breaker for the protection and insulation of substation equipment
- Resistors for bus discharge and protection against overvoltage

The final results of this project are not yet quantifiable, but, so far, meet the expectations that were set forward.

Intangible benefits
Impact on the culture of energy efficiency in Metro Bilbao Metro and other railway networks.

Lessons learned
This new energy efficiency culture, which has taken root in the Bilbao Metro staff, has been the engine for designing new consumption improvement measures. For example, the redesign of the running of trains with energy efficiency criteria or the change of strategies and conceptual designs, not just changes to other more efficient technologies. Metro Bilbao has been a pioneer in implementing this project for returning power to the network. From the first moment on, it has practiced an "open doors" policy that has helped to spread this solution among other railway networks. The company intends to continue this policy of diffusion with all the solutions it implements for improving energy efficiency. Communication shortens periods and, by taking advantage of the experience of others, allows one to focus on the particularities of each network.

“REVERSIBLE SUBSTATIONS RETURN TO THE NETWORK THE ENERGY THAT WAS PREVIOUSLY BURNED IN RESISTORS”
CONSTRUCTION OF THE NEW MRW HEADQUARTERS WITH BREEAM CERTIFICATION

NUMBER OF EMPLOYEES
10,000

WEBSITE
www.mrw.es

CONTACT
Sara Pons, Director of Social Responsibility
sara.pons@mrw.es

LOCATION
MRW Headquarters in L’Hospitalet de Llobregat, Barcelona (Spain)

STAKEHOLDERS
Employees, society

RESOURCES
- Financial: 8,000,000 €
- Time: 84,840 hours

MAIN AIM
- To reduce the environmental footprint of the company, giving priority to energy efficiency issues

SPECIFIC AIMS
- Cost savings: approximately 26,000 €/year
- Energy savings: 50% of the energy consumption, equivalent to 228,000 kWh/year
- Emission reduction: 60 t of CO2/year

TAGS
Eco-design, solutions for reducing energy consumption in buildings, certified energy management system
The new MRW Central Services building, located in L'Hospitalet de Llobregat in Barcelona, is designed and built under the criteria of paying respect to the environment with the aim of minimizing the ecological footprint of the company.

It is characterized by its large savings in the consumption of resources and the efficient management of the generated waste, while providing at the same time a high degree of user comfort. Specifically, energy consumption is reduced by 50% and water consumption by 40%.

This is possible thanks to the incorporation of solar panels for water heating, together with the high efficiency of its lighting system. It also has a double facade made up of strips that are oriented automatically by light sensors optimizing the use of natural light, while the intensity of artificial light required is regulated inside. This system, along with its plant-covered roof improves thermal insulation. Similarly, the induction air-conditioning system (air-water system) generates significant savings in energy costs.

It is worth mentioning that, in order to promote sustainable mobility, the location of the building is chosen strategically to allow easy access by public transport and a parking space is reserved in the car park for recharging electric vehicles and for parking bicycles.

Thus, this “smart building” becomes a Class A building, according to the criteria of the Institute for Energy Diversification and Saving - IDEA, and the first building in Spain to obtain, in the design phase, the Breeam certification with excellent rating.

Intangible benefits
On the one hand, the reduction in greenhouse gas emissions helps slowing down the negative effects of climate change. On the other hand, increasing the comfort of the employees is reflected in improved productivity.
ENERGY REHABILITATION OF AN INDUSTRIAL LABORATORY WITH THE THERMIC-WALL SYSTEM

**SECTOR** BUILDING MATERIALS (SME)

**NUMBER OF EMPLOYEES**
5

**WEBSITE**
www.nutecsl.es

**CONTACT**
Elisa Valia Cotanda
cientific@fundacioninvestigacion.org

**LOCATION**
Manises Airport industrial area, Valencia

**STAKEHOLDERS**
Clients, employees

**RESOURCES**
- Financial: 15,000 €
- Time: 480 hours

**MAIN AIM**
- To fit out the industrial laboratory for its use as such, using materials that generate a lower energy consumption and greater comfort

**SPECIFIC AIMS**
- Cost savings: is equivalent to 40% of cost saving compared with other materials, such as ceramic brick or plasterboard panels

**TAGS**
Technological innovation, eco-design, cost savings
Firstly, the partitions are made to define the space which shall serve as laboratory in which the Thermic-Wall system are installed and then the plumbing and electricity installations are carried out to provide the laboratory with the supplies needed to carry out the tests.

The laboratory work has nothing to do with the work carried out in the rest of the building, so sufficient thermal and acoustic insulation is required. On one hand, the production work carried out in the building produces, at peak times, high noise levels which can disturb the work performed in the laboratory. On the other hand, the temperature and humidity conditions within the laboratory must be controlled and shall not be affected by the conditions of the building, neither in winter nor in summer.

The thermal insulation achieved with the Thermic-Wall system results in a saving of the energy used for the air-conditioning of the laboratory, primarily in the colder months. Furthermore, it minimizes heat loss, which is very significant due to the gradient temperature between the inside and the outside of the laboratory.

Specifically, the partitioning system used for the partitions allows savings of approximately 40% of the costs involved in using other materials such as ceramic brick or plasterboard panels, representing savings of 2,400 €/year.

Lessons learned
Investment in sustainable and energy efficient materials is very profitable in the long term; in this case, the company plans to implement this energy rehabilitation model in other premises it owns.
FREE COOLING PROJECT
IN BASE STATIONS

SECTOR ICT

NUMBER OF EMPLOYEES
3,000

WEBSITE
www.orange.com

CONTACT
Guillermo Bujalance, Infrastructure Manager
guillermo.bujalance@orange.com

LOCATION
France Telecom base stations in Spain

STAKEHOLDERS
Clients, employees, society

MAIN AIM
- To provide Orange Spain access network sites with a ventilation system that minimizes the operation of air-conditioning equipments, thereby obtaining a saving in the energy consumption of the site

SPECIFIC AIMS
- Cost and energy savings: 22% of the electricity consumption of the site

TAGS
New technologies, smart grids, carbon footprint
The company has installed a ventilation system consisting of four subsystems: partitioning, drive, emergency and control; by means of which the air-conditioning of the site is controlled so that it does not operate until the outdoor temperature of the booths exceeds a particular value.

The use of free ventilation systems, in replacement of mechanical ventilation equipment, improves the performance of the equipment and facilities located therein, making it possible even to do without the latter in a major part of the telecommunication sites which provide access services to clients. This enables to be more energy efficient, achieving significant savings on electricity bills and contributing to the improvement of the environment.

Specifically, the cost savings resulting from this project are 9,000,000 €, the energy savings are 78.14 GWh and the reduction in CO₂ emissions is 23,359 mt (metric tons).

Intangible benefits
With the reduction of energy consumption and therefore CO₂ emissions into the atmosphere, we contribute to the improvement of the environment, which has an impact on our company’s involvement in the improvement and sustainability of its environment.

"Cost savings are 9,000,000 €"
SECTOR CONSTRUCTION

NUMBER OF EMPLOYEES
1,900

WEBSITE
www.orona-group.com

CONTACT
Joseba Erauskin, Business Development Manager
jjerauskin@orona-group.com

LOCATION
Orona S.Coop (Spain)

STAKEHOLDERS
Property managers, construction companies, partners, employees, society

MAIN AIM
- To manage sustainability and energy efficiency throughout the activity of the organization

SPECIFIC AIMS
- Energy saving of product: 50% in operation, 90% in lighting, 45% in regeneration
- Energy saving of Orona infrastructure: 20% savings compared to current consumption

TAGS
Eco-design, solutions for reducing energy consumption in buildings, carbon footprint
"Orona’s Green" represents the strong commitment of the organization to manage sustainability and energy efficiency comprehensively in all its activities, in line with its commitment to the future.

Compliance with the criteria required by the UNE 15031:2003 standard have allowed Orona, since 2008, to become the first lift sector company worldwide that is certified in eco-design, expanding the scope of this certification to a global level in 2011 (ISO 14006).

That same year, 58.77% of the equipment produced by Orona had eco-design characteristics, offering lifts with maximum energy rating (class A) which comprise the following solutions:

- Low consumption operation: use 75% less than hydraulic lifts and 50% less than two-speed electric lifts
- Efficient lighting: feature low consumption cabin lighting systems, with savings of between 70% and 80%
- Automatic cabin lighting systems: reduce consumption by 95%
- Stand-by systems
- Energy regeneration: systems capable of returning to the network up to 45% of the energy consumed by the engines

Specifically, the savings in energy units that this technology provides to the client amount to 1,700 kWh a year.

However, in 2011, Orona has been progressing in the total integration of Environmental Management obtaining ISO 14001 certification for each of its workplaces in all the Autonomous Regions.

In this context, it is worth mentioning the following projects:

- The performance of an energy audit at the production centres
- The implementation of improvement actions, including specific projects for the monitoring and control of energy consumption
- The creation of the necessary foundations to obtain energy efficiency certification in the near future

Through these measures, the company has managed to achieve the initial goals and reduce its energy consumption by a total of 1,740,000 kWh a year.

**Intangible benefits**
Raising employees’ awareness in the area of sustainability, less impact on the environment and improved brand image and market positioning in Europe.

**Lessons learned**
Orona’s Green is set up as a long-term business commitment, integrated in the business strategy of Orona and therefore, applied in all organizational areas of the company. Therefore, the path taken is not made with the expectation of short-term recoveries, but as a crucial, permanent activity, in line with the concept of Commitment to the Future, intrinsic to our values and socio-entrepreneurial vision.
ENERGY EFFICIENCY IN THE TELECOMMUNICATIONS NETWORK

SECTOR ICT

NUMBER OF EMPLOYEES
4,335

WEBSITE
www.vodafone.es

CONTACT
Rosa Gómez, Head of Sustainability
rosa.gomez@vodafone.com

LOCATION
All the communications network in Spain

STAKEHOLDERS
Employees, suppliers, society

MAIN AIM
- To improve energy efficiency and reduce environmental impact through the acquisition and implementation of more efficient technologies

SPECIFIC AIMS
- Energy savings: 8% of expected energy consumption
- Emission reduction: 8% of expected CO₂ emissions and 35% of CO₂ emissions with regard to the traffic

TAGS
New technology, smart grids, carbon footprint
As in most business activities, the development and provision of telecommunications services involves energy consumption both for the operation of the network and for store and office activities.

For the continuous improvement of energy efficiency of these activities and the reduction of the associated environmental impact, Vodafone Spain has launched several Energy Efficiency Plans.

In the first of these (2003-2006), actions related to refrigeration systems in the network were implemented, resulting in the saving of 3% in energy consumption and 3% in CO₂ emissions, i.e. 13,059.1 MWh and 4,637 t of CO₂, respectively.

Later, in 2006, it launched a new Energy Efficiency Plan which includes much more ambitious improvement goals, including major investments in more efficient technologies.

All proceedings included in this Plan are intended to increase energy efficiency in the Base Stations and Switching Centres, where the measures described below are gradually being implemented:

**At Base Stations:**
- Installation of heat removal systems at stations with split A/C equipment that does not have free-cooling
- Installation of more efficient A/C equipment
- Raising of the set-point temperature of stations
- Installing or replacing with more efficient equipment in 3G stations
- Sharing agreements with other operators

**At Switching Centres:**
- Installation of refrigeration systems with free-cooling
- Turning off unoccupied areas
- Removal of obstacles with raised floor
- Closing of some centres

Despite the increased activity of Vodafone Spain in recent years, these measures have ensured that power consumption does not increase in proportion to the development of the activity.

Specifically, the goal of reducing power consumption by 8% has been exceeded and a 12.8% saving on expected consumption has been achieved. Since the launch of the first Energy Efficiency Plan on the Network, a total of 141,855 MWh have been saved. Energy reduction through network element has been 15.6% since 2006.

The same is true of the reduction of CO₂ emissions, the goal of saving 8% has been exceeded and a saving of 11.8% has been achieved, with a 87.6% reduction in CO₂ emissions with regard to traffic (the target set was 35%). Reduction of CO₂ emissions through network element was 29.8%.

Currently, it can be considered that Vodafone Spain has one of the most efficient networks in Europe.

**Lessons learned**
Vodafone Spain has discovered that the keys to success of the carried out Energy Efficiency Plans are as follows:
1. All actions are supported and approved by the supreme head of the company
2. Definition of the goals to achieve
3. Planning
4. Creation of a work team consisting of people from all affected areas
5. Regular monitoring of the progress of the Plans
contra ficha Vodafone
Infrastructure
contra separador
Infrastructure

Page
84 Aqualogy Aqua Ambiente Servicios Integrales, S.A.
86 BSH Electrodomésticos España, S.A.
88 CEMEX Spain, S.A.
90 Eco2Next Solutions, S.L.
92 Grupo Antena 3
94 Holcim Spain, S.A.
96 Laboratorios del Dr. Esteve, S.A.
98 NH Hotels
100 SEAT, S.A.
102 Técnicas Reunidas, S.A.
IMPLEMENTATION OF ACTIONS ARISING FROM THE ENERGY AUDIT AND RENEWABLE ENERGY PLAN

NUMBER OF EMPLOYEES
180

WEBSITE
www.aqualogy.es

CONTACT
Juan Antonio Imbernón

LOCATION
Integrated water cycle companies in Spain in which the Agbar group holds a share

STAKEHOLDERS:
Energy Efficiency Department, Environment Department, employees in general

RESOURCES
- Financial: 350,000 €/year
- Time: 9,840 hours/year

MAIN AIM
- To improve energy saving by optimizing the use of existing means of the existing facilities

SPECIFIC AIMS
- Cost savings: those arising from the reduction in energy costs
- Energy savings: 2,300,000 kWh/year
- Emission reduction: 621 t CO₂

TAGS
Rehabilitation and fitting-out of installations: energy audits, development and implementation of renewable energy
In order to reduce electric energy consumption and greenhouse gas emissions, several energy audits are conducted in all water cycle facilities of Aqualogy all over the country; these were distributed as follows:

- 2009: 74 audits reviewed
- 2010: 125 audits reviewed
- 2011: 129 audits reviewed

The result of the audits leads to the audit reports, which reflect the potential savings that could be made if all the improvements detected were implemented along with the proposed corrective actions to be taken to achieve this goal. This includes actions to improve the performance of existing equipment, adjustment of the contracted electricity rate and optimization of the operating system of facilities.

In addition, the analysis and improvement proposals put particular emphasis on the promotion of new renewable energy sources: solar and hydro, basically.

They also include an economic study on the recovery of the investment required for the implementation of corrective actions and the monitoring of the level of execution and capture of savings of the proposals identified.

Specifically, the calculation of cost savings achievable in the long term through the implementation of all proposed improvements is 4,634,291 €/year. The cost savings percentage achieved today is 25.6%, i.e. 1,806,723 €/year.

Similarly, the calculation of energy savings is 25,527,128 kWh/year. The percentage of savings achieved today is 35.4%, i.e. 7,199,233 kWh/year. And the reduction in CO2 emissions is 1,943 t.

Intangible benefits
The fact of conducting audits to improve energy efficiency is in itself a commitment to the environment and to the population in general. When these audits result in reports with specific data and goals, the commitment can be quantified and, therefore, it is more feasible to carry it out. This adds value to the corporate responsibility of Agbar and to its environmental care image.

Lessons learned
Proposals for improvement in these facilities can be summed up as: 1. Study of the most appropriate rate and benefits obtained, 2. Analysis of the operating system, with improvement alternatives and 3. Proposals for the performance adjustment or replacement of equipment.
RADIANT TUBE GAS HEATING

BSH ELECTRODOMÉSTICOS ESPAÑA, S.A.

NUMBER OF EMPLOYEES
3,777

WEBSITE
www.bsh-group.es

CONTACT
Alfredo Ruiz de Gopegui, Head of Engineering at the Cooking Appliances Factory in Montañana
alfredo.ruiz-de-gopegui@bshg.com

LOCATION
Montañana, Saragossa (Spain)

STAKEHOLDERS
Employees

RESOURCES
- Financial: 80,000 €
- Time: 300 hours

MAIN AIMS
- To save on natural gas consumption
- To reduce CO2 emissions associated with the consumption of natural gas
- To improve thermal comfort at the workplace in factories
- To simplify the maintenance of heating systems

SPECIFIC AIMS
- Cost savings: 90,000 €/year
- Energy savings: 3,000,000 kWh/year
- Emission reduction: 550,000 kg CO2/year

TAGS
Solutions for reducing energy consumption in buildings, savings plans

SECTOR MANUFACTURING, ELECTRICAL APPLIANCES
The heating of factory buildings with a height of more than six metres worked by supply air systems, previously heated by a water to air heat exchanger. This implied a higher temperature at roof level than at floor level and undesirable convection currents for workers.

The radiant tube system emits infrared radiation that generates heat when it is absorbed by a solid body such as persons, the floor or the facilities. There is virtually no energy loss because the air can be considered a medium which is transparent to radiation. Its installation is simple as it just needs to be hung from the ceiling with chains and connected to the natural gas outlet.

Thanks to this system, significant reductions in natural gas consumption and CO₂ emissions are achieved as well as immediate thermal comfort at work-places and greater comfort at lower temperatures. Furthermore, it prevents air currents and the airborne dust they cause, heat loss through the ceiling by concentrating the heat at ground level and it is not necessary to turn on the pipes hours before the working day begins because heat is almost immediate.

That is how BSH Electrodomésticos España achieves a 60% reduction in heating consumption with regards to its previous situation, which amounts to a savings of 4,000,000 kWh/year, prevents the emission of 7,344,000 kg of CO₂ by reducing the consumption of natural gas and obtains cost savings of 120,000 €/year.

Lessons learned
The installation of this heating system has allowed the company to optimize the resources aimed to the comfort of persons and also consider eliminating the some natural gas boiler which was only needed as reinforcement in the winter season, making its facilities much more efficient.
It is also a very suitable system for factory buildings where the ceilings are high and surfaces with different uses coexist. Because heat can be directed effectively, only the areas occupied by people are heated.
Therefore, this action has spread to other factories of the company in Santander, La Cartuja - Saragossa and Esquíroz - Pamplona, generating savings in all of them of around 40% compared to the previous situation.

“A 60% REDUCTION IN HEATING CONSUMPTION IS ACHIEVED IN COMPARISON TO THE PREVIOUS SITUATION”
THERMUR – CEMEX SOLUTION FOR MORE SUSTAINABLE CONSTRUCTION

SECTOR: BUILDING MATERIALS

NUMBER OF EMPLOYEES
1,743

WEBSITE
www.cemex.es
www.cemex.es/mo/THERMUR/index.html

CONTACT
Javier Fuertes, Director of Marketing, Sustainability and Communications
javier.fuertes@cemex.com

LOCATION
Applicable to both new construction and restoration

STAKEHOLDERS
Clients, architects, public administrations, hotels, large buildings, building managers, residents’ communities, house owners, etc.

MAIN AIM:
- To reduce energy consumption by 35%
thereby reducing the cost associated with the air-conditioning and heating of buildings equipped with THERMUR

TAGS
Solutions for reducing energy consumption in buildings
The usage phase of buildings is responsible for 84% of the energy consumed during the life cycle thereof, so that the construction of low demand housing is an urgent need for the current society.

In Spain, the number of buildings is about ten million, of which nearly nine and a half million are residential. About 60% of these homes were built before 1980, prior to the appearance of the set of technical standards governing the quality of buildings and, more specifically, the first rules to regulate the energy efficiency of buildings.

Investment in insulation is the energy-saving measure where the best cost-benefit ratio is obtained. Insulating a building produces from the first day of operation a reduction in consumption which is accumulated over the lifetime of the insulated element.

The facade insulation system, THERMUR, developed by CEMEX, is the best thermal inertia, achieving energy savings of up to 35%. It also gives the facade high durability, water impermeability and water vapour permeability and provides high acoustic insulation, resulting in greater comfort and savings.

This is a multilayer building system on the basis of EPS expanded polystyrene insulation panels with mortar adhered to it with a wide range of plastering possibilities of great versatility and aesthetics, with many decorative possibilities.

The Outdoor Composite Thermal Insulation System, THERMUR, has European Technical Approval (ETA) awarded by the IETcc, meeting the insulation and durability requirements of the ETAG004 EOTA standards.

Intangible benefits
This is a quick and easy installation system that allows perfect adaptation of the building to climate, facilitating warming and cooling and preventing possible damp and thermal bridges. It also meets health and safety requirements satisfactorily, reducing the risk of discomfort and illnesses in users and the potential environmental consequences and maintenance or deterioration of the building.
It is a very versatile system that can be adapted to any existing medium and does not require the persons to vacate the house for installation.
CHANGE OF LIGHTING UNDER A SHARED SAVINGS CONTRACT

ECO2NEXT SOLUTIONS, S.L.

NUMBER OF EMPLOYEES
1 employee and 4 freelancers online

WEBSITE
www.eco2next.com

CONTACT
David Martín de Bustos, Director
david.martin@eco2next.com

LOCATION
Common services of the building housing the CEVASA headquarters, C/Meridiana 360 in Barcelona. Having validated the pilot, it will be applied to the 50 CEVASA promotions, located mainly in Barcelona and Madrid (Spain)

STAKEHOLDERS INVOLVED
ICAEN, clients, users

RESOURCES
- Economic: 510,000 € (pilot test: 10,000 €; extrapolation: 500,000 €)
- Time: 600 hours (pilot test: 50 hours; extrapolation: 550 hours)

MAIN AIM
- To reduce energy consumption in the provision of general services in buildings managed by CEVASA and, therefore, obtain a reduction in the bills

SPECIFIC AIMS
- Cost savings: pilot test 4,485 €/year; extrapolation: 221,752 €/year
- Energy savings: pilot test: 69%, equivalent to 31,352 kWh; extrapolation: 1,550,000 kWh or 1,550 MWh
- Emission reduction: pilot test: 6,820 kg CO2/year; extrapolation: 341 t CO2/year

TAGS
Climate change mitigation, waste management, savings plans
**A shared savings** pilot contract is signed for the electricity supply of the common services of one of the buildings managed by CEVASA. The total investment is provided by Eco2Next.

**The measures** carried out in the pilot test consist of replacing the permanent lighting on stairways by LED lighting with sound detection and lighting in the hallways by LED lighting without detection.

**The philosophy** of the pilot test is to try the proposed model and then standardize it to other promotions. The objectives are calculated from the actual results yielded by the current pilot test.

**Intangible benefits**
Improved lighting quality. Savings generated by reduced maintenance and longer service life of the new lighting.

“**ESTIMATED ANNUAL ENERGY SAVINGS ARE 1,550 MWh**”
Replacing all existing traditional lighting on the news set with state-of-the-art LED technology

Sector Media

Number of Employees
1,849

Website
www.grupoantena3.com

Contact
Jesús Galera, Head of Heritage
jgalera@antena3tv.es

Location
Antena 3 Televisión News Set (Spain)

Stakeholders
Employees, suppliers

Resources
- Financial: 89,000 €
- Time: 4 months

Main Aim
- To replace lighting of the Antena 3 TV news set with a new system based on state-of-the-art low-power LED projectors, without impairing image quality

Specific Aims
- Cost savings: 2,115 €/year
- Energy savings: 23,500 kWh/year
- Emission reduction: 2.35 t CO₂ (indirect type)

Tags
Solutions for reducing energy consumption in buildings
**Energy efficiency** is a major concern for the Grupo Antena 3. Thanks to a number of studies for determining the energy efficiency of the new equipment acquired, it is gradually being ensured that all the tasks performed by the organisation use only the essential energy.

In this context, the Board of Operations Management of the Grupo Antena 3 is responsible for carrying out the replacement of all the lighting of the Antena 3 news set with one that incorporates LED technology, a project to be carried out in four months and with a total investment of 89,000 €.

This project achieves a reduction in energy consumption of over 56,000 kWh/year and a reduction in the consumption of energy for cooling required due to the heat output of incandescent lighting sources.

In addition, the specific aims which were set initially are exceeded, achieving cost savings of 5,040 € a year and a reduction in CO2 emissions of 5.6 t/year.

**Intangible benefits**
Increased awareness of workers and managers of the Grupo Antena 3 on environmental issues and, specifically, in the struggle to save energy; an effort which is also rewarded externally, as tours of the facilities are requested.

**Lessons learned**
The data show that the replacement of incandescent lighting by the new LED technologies is undoubtedly a step forward both economically because of the low power consumption and low maintenance, and environmentally because of the reduced volume of CO2 emissions (indirect) and the increased useful life. All this, taking into account that there has been no deterioration in the image quality.

“MORE EFFICIENT LIGHTING SAVES 56,000 kWh A YEAR”
DEVELOPMENT OF MORTARS FOR GEOTHERMICS, HOLCIM ENERGROUT

NUMBER OF EMPLOYEES
1,050

WEBSITE
www.holcim.es

CONTACT
Isidora Díaz, Head of Quality and Innovation Department
isidora.diaz@holcim.com

LOCATION
Dry mortar manufacturing plant in Vicálvaro, Madrid

STAKEHOLDERS
Geothermal companies, construction companies, end users of geothermal installations

RESOURCES
- Time: 200 hours (dosage development, analysis, industrial testing, etc.)

MAIN AIM
- To develop a range of high thermal conductivity mortars for use in geothermal installations

SPECIFIC AIM
- To contribute to the overall reduction of CO2 emissions by permitting the effective implementation of geothermal installations

TAGS
Development and implementation of renewable energy, solutions for reducing energy consumption in buildings, technological innovation
At its Vicalvaro plant in Madrid, Holcim Moteros has developed a complete range of high conductivity mortars that has permitted the correct execution of several geothermal installations throughout Spain.

Geothermal energy is a renewable energy that provides economic, environmental and architectural benefits for the end-user of the installation, such as reduced greenhouse gas emissions, elimination of noise, savings of 50% on the energy bill, increased useful life of air-conditioning equipment, improved aesthetics of the building since there are no visible external elements on facades and roofs; or saving space on rooftops and terraces.

The Holcim products available to the market for implementing geothermal installations are:
- HD 2.1 Mortar: Dense, pre-dosed mortar with high thermal conductivity, 2.1 W/mK, and good rheology for its injection.
- HDF 2.0 Mortar: Dense, pre-dosed mortar with high thermal conductivity, 2.0 W/mK, and good rheology for its injection. Specially designed for installations that require a small particle size. Maximum particle size: 0.3 mm.
- LD 3.0 Mortar: Pre-dosed slurry with very high thermal conductivity, 3.0 W/mK. Specially designed for installations requiring higher thermal conductivity.

The products are supplied bagged or in bulk. It is also possible to develop products tailored to customer needs.

In 2011, a total of 35,300 linear metres of geothermal drilling was carried out which was sealed with high thermal conductivity mortars manufactured by Holcim. These metres represent an approximate power of 1.8 MWh, resulting in the corresponding reduction in overall emissions.

Lessons learned
The introduction of new energy sources that allow more sustainable building requires the commitment of all stakeholders, from public authorities to the end user, to developers and construction companies. This commitment will allow new sources of renewable energy, such as geothermal energy, to become a part of the construction sector in Spain.
INSTALLATION OF RECOVERY GENERATORS IN MUNTERS STEAM DRYERS

NUMBER OF EMPLOYEES
1,600

WEBSITE
www.esteve.es

CONTACT
Paz Arias, Safety and Environment Manager
parias@esteve.es
Sergi Palomino, Safety and Environment Technician
spalomino@esteve.es

LOCATION
Martorelles plant, Barcelona (Spain)

STAKEHOLDERS
Management of ESTEVE, suppliers, consultants, employees, employee representatives, certification authorities, public authorities

RESOURCES
- Financial: 23,200 €
- Time: 300 hours

MAIN AIM
- To reduce energy consumption and CO₂ emissions by installing static recovery generators that use the energy of the air expelled by Munters dryers, to preheat the new incoming air

SPECIFIC AIMS
- Cost savings: 10,390 €/year
- Energy savings: 275,939 kWh
- Emission reduction: 49,945 kg CO₂

TAGS
Solutions for reducing energy consumption in buildings
**The Munters** equipment dries the humidity from the air using steam to heat the air. After the air has been heated and the humidity absorbed, the warm air is emitted to the outside of the plant, outside air being brought in to repeat the procedure, using energy in the form of steam needed to heat the new air.

**To carry out** this energy improvement measure, it is necessary to make a modification to the air outlet pipe, installing a static heat exchanger in each of the units and communicating it with the air inlet of each dryer. Since it is a static recovery generator, there is no contact between the incoming and outgoing air and, therefore, contamination of the new air is avoided, thus fulfilling quality requirements.

**In 2012,** ESTEVE is carrying out this improvement in eight of the centre’s Munters dryers, those with the highest operating time, and in 2013 it plans to do so with the rest.

**This project** has resulted in annual cost savings of 10,390 €, energy savings of 275,939 kWh/year and a reduction in CO₂ emissions of 49,945 kg/year.

**Intangible benefits**
Contributing to the fight against climate change and raising the staff awareness about the installation and use of the best and most efficient technologies available, to encourage energy efficiency starting with the design and definition of engineering projects.

**Lessons learned**
The project has made it possible to assess more efficient ways of performing operations, taking into account economic, environmental and social parameters.

“THE STAFF IS MADE AWARE ABOUT THE USE OF THE BEST AND MOST EFFICIENT TECHNOLOGIES AVAILABLE”
IMPLEMENTATION OF LED LIGHTING IN AREAS OF RAPID AMORTIZATION IN ALL HOTELS IN THE CHAIN, OWNED OR LEASED

NUMBER OF EMPLOYEES
18,000

WEBSITE
corporate.nh-hoteles.es

CONTACT
Juan Antonio Caballero, Department of Environment and Engineering

LOCATION
All hotels in the chain
Stakeholders: employees, clients

RESOURCES
- Financial: 1,203,000 €

MAIN AIM
- To implement LED technology in those light sources which are switched on for over 12h/day

SPECIFIC AIMS
- Cost savings: 1,980,000 €/year
- Energy saving: 18,000,000 kWh/year
- Emission reduction: 7,560 t CO₂

TAGS
Solutions for reducing energy consumption in buildings
LED technology has been applied to lighting now for several years. But only recently have lamps become available that replace the conventional lamps while maintaining 100% of the light levels. Although “low light level” products can be applied to decorative areas, for areas where it is necessary to keep lighting levels high it is necessary to use high power products.

Thus, NH Hotels has tested over one hundred different products to replace a halogen lamp in order to identify the ideal product to be installed in each area. Having chosen the models for each application, the company created a catalogue for its hotels indicating which product they should choose for each use.

Thus, needs are identified for each hotel according to the requirements, for example: reception, restaurant and work areas are areas of "high lighting requirement", while the lifts, decorative light sources or light sources for signs are areas of "low lighting requirement".

Following these premises, in 2012, NH Hoteles has installed over 53,000 LED lamps to replace conventional lamps and expects to have installed 75,000 units by the end of the year. Additionally, LED units are already being installed for lighting in all replacements.

In later phases, fluorescent tubes will be replaced by their LED alternative and down-lights with compact fluorescent lamps by LED lamps with similar characteristics. Tests are currently underway with different products.

Besides the usual energy saving, the longer useful life of these devices generates savings in the replacement of lamps, which results in a saving on buying new lamps and lower lamp replacement time, which can be devoted to other tasks; less maintenance, as these light sources are not as hot as conventional ones and avoid the appearance of the blackened rings from the heat of the lamp and transformer; and lower thermal loads from lighting, which is quite appreciable in areas with low ceilings or in enclosed spaces, such as lifts.

Specifically, with the implementation of this new system, NH Hoteles achieves cost savings of 1,980,000 €/ year, energy savings of 18,000,000 kWh/year and a reduction in CO2 emissions of 7,560 t.

Intangible benefits
Guests, who know the technology and see it as modern and being connected to the respect for the environment, welcome these measures.

Lessons learned
In the market there is a wide range of LED products of varying quality. It is necessary to require manufacturers to ensure that products meet minimum guarantees of safety, quality and reliability. We have tested products that advertised 50,000 hours of life and with just 4,000 h had already lost 25% of their light output. The same is true for the maintenance of the light colour.

Similarly, it is important to bear in mind that there are different types of LED lamps with different sizes and connection sockets. Moreover, you should pay attention to the different colours of light LED technology permits.

LEDs are now no longer just lighting, they are technology. And the progress of the new models is as fast as the obsolescence of the models they replace.
ADAPTATION OF THE FORMER SEAT COGENERATION PLANT

SECTOR AERONAUTICS, AUTOMOTIVE, MOTORWAYS

NUMBER OF EMPLOYEES
11,394

WEBSITE
www.seat.es

CONTACT
Raúl Juberias, Head of Powerplant and Auxiliary Services
raul.juberias@seat.es

LOCATION
Martorell, Barcelona (Spain)

STAKEHOLDERS
Employees

MAIN AIM
- To optimize the productivity of the Martorell cogeneration plant

SPECIFIC AIMS
- Cost savings: over 2,000,000 €
- Energy savings: 40,000,000 kWh/year
- Emission reduction: 10,000 t CO₂/year

TAGS
Solutions for reducing energy consumption in buildings, development and implementation of renewable energy, carbon footprint

100 INFRASTRUCTURE
The technology originally installed in the Martorell cogeneration plant, along with the main components and systems, are now obsolete and with the resulting risk of failure, failing to comply with the future legislation regarding the new required NOx limits.

Therefore, SEAT has changed and adapted several elements in the aforementioned cogeneration plant with the aim of achieving a higher productivity.

Thus, it has replaced the gas turbine with another of higher efficiency, which enables more efficient operation at partial loads. The burners have also been replaced by others with higher efficiency and modulation.

Subsequently, new measuring points were installed and the existing ones upgraded for better control of the optimum operating parameters. All this information is controlled from a station for the collection of energy data from throughout the factory.

Due to this project, the company has improved the current heat generation of the factory by 70% to 90% and the electricity generation has risen from 40% to 50% of the consumption of the SEAT factory in Martorell.

Specifically, it achieves cost savings of over 2,000,000 €, energy savings of 43,280,000 kWh/year and a reduction in CO2 emissions of 11,700 t/year.

Intangible benefits
Contribution to improve the energy consumption and environmental factors in accordance with the environmental aims set forth by the Volkswagen Group (improving energy efficiency by 25% until 2018).

Lessons learned
Experience in coordinating a large project. Providing new development ideas during the implementation of the project.
ENERGY SAVING SYSTEM FOR THE OFFICE INSTALLATIONS OF TÉCNICAS REUNIDAS IN MADRID

SECTOR ENGINEERING

NUMBER OF EMPLOYEES
5,933

WEBSITE
www.tecnicasreunidas.es

CONTACT
Laura de Eugenio, Environmental & Permitting Manager
leugenio@trsa.es
Laura Bravo, Secretary of the Board of Directors
lbravo@trsa.es

LOCATION
Técnicas Reunidas offices in Madrid (Spain)

STAKEHOLDERS
General Services Department, Department of Health, Safety and Environment (HSE), employees in general

RESOURCES
- Time: report and energy audit: 380 hours; implementation: throughout 2012

MAIN AIM
- To implement an energy saving control system to reduce the annual energy bill of the building by 25% - 30% with investment recoveries of 5 to 8 years

TAGS
Solutions for reducing energy consumption in buildings
In its offices in Madrid, Técnicas Reunidas adopted measures in the three existing supplies that come from the general low voltage panel.

The company made an in-depth analysis of the 10th floor and concluded that most of the consumption is due to lighting and that therefore that is the item where an intervention is necessary. At that time, fluorescent lamps were used which are switched on by electromagnetic ballasts.

Therefore, it is recommended changing to more efficient lighting that allows savings of 40% and require less maintenance cost. Meanwhile, the implementation of sensors represents a saving of 40% in consumption.

The state of existing lighting was also examined and it was observed that, because of inadequate maintenance, their efficiency was 70% which results in poor lighting.

Based on the described studies the following recommendations are made:

- Awareness and rational use of electricity
- Use of more efficient lighting: replacement of lights with four 36W tubes (260W power) by three 14W tubes (76W power) – 30% savings
- Replacement of 16W electromagnetic ballasts with 1-2W electronic ballasts
- Automatic switching off of lights: installation of motion sensors in the 17 floors of the building – 25% savings
- Monitoring by floors and scheduled maintenance
- Balanced load distribution in all panels
- Awareness campaigns

Due to this project, the initially proposed goal of 25% reduction in energy consumption is achieved as well as lowering the economic cost associated with it.

Lessons learned

By implementing an energy plan for the Técnicas Reunidas offices in Madrid, located in the building at Arapiles St. 14, the two fundamental aims for which the plan was implemented have been achieved: firstly, to achieve considerable savings in electricity bills, and secondly, to optimize the use of natural resources, an aim set forth by the Environmental Management System implemented in the Group.

Because of the results obtained, during the current financial year two other energy efficiency plans have been launched in order to achieve similar results in two other buildings.
contra ficha Técnicas reunidas
Measurement and Control
contra separador
Measurement and Control

Page
108 Consum Sociedad Coop. Valenciana
110 Districlma, S.A.
112 Endesa
114 Ferro Spain, S.A.
116 Grupo Mahou-San Miguel
118 Red Eléctrica de España, S.A.U.
120 Volkswagen Navarra
SAVINGS AND ENERGY EFFICIENCY PLAN

NUMBER OF EMPLOYEES
10,103

WEBSITE
www.consum.es

CONTACT
Javier Martínez, Department of Development
javierm@consum.es

LOCATION
Consum S. Coop. Valenciana (Mediterranean area, Spain: Catalonia, Valencia, Murcia, Castile- La Mancha)

STAKEHOLDERS
Sales Department (use) and Development Department (control, supervision and analysis of future solutions); employees in general

RESOURCES
- Financial: 12,000,000 €
- Time: 85,000 hours

MAIN AIM
- To reduce energy consumption, improve efficiency and minimize the environmental impact associated with the activity through the rational use of energy sources

SPECIFIC AIMS
- Energy savings: 75,000,000 kWh
- Emission reduction: 16,725 t CO2

TAGS
Savings plans, efficient resource management: measurement and control

SECTOR
FOOD, BEVERAGES
To achieve a reduction in energy consumption, Consum Sociedad Coop. Valenciana has launched a Savings and Energy Efficiency Plan, for which the energy consumption of each element of its facilities is analysed, establishing their structure according to the end uses, and setting consumption levels according to their category and location.

This Plan, which aims to reduce the impact the company has on the environment, is based on three main lines of action, namely:

1. Manual of Good Habits on Efficient Use of Equipment and Facilities: education and awareness of employees on the proper use of equipment and facilities is the cornerstone of the launch of the Plan.
2. Systems for Controlling and Monitoring Energy Consumption: this system allows measuring the consumption of each point of supply and, therefore, optimizing its operation by automating any repetitive processes and implementing different savings strategies according to the season and use thereof, establishing improvement actions.
3. Use of more efficient technologies: the organization is equipped with machinery and facilities of a high technological level thanks to the different measures that are still applied today.

This system allows us to know both the information necessary to implement the most effective measures and real-time consumption to avoid deviations from expected consumption.

Specifically, the cost savings achieved through the implementation of the Plan are 9,400,000 €, the energy savings are 72,307,692 kWh and the reduction in emissions is 16,125 t of CO2.

Intangible benefits
Decrease in the daily tasks of staff due to automation of processes and increased comfort at the point of sale.

Lessons learned
The main motivations for joining this challenge have been the cost reduction, the adoption of improvement processes, the organization’s commitment to the environment and the viability of these actions.
In summary, the project described has supported a comprehensive control, avoiding unnecessary losses that do not produce any added value.
URBAN HEATING AND COOLING NETWORK OF BARCELONA: A SMART ENERGY SOLUTION FOR SUSTAINABLE DEVELOPMENT

NUMBER OF EMPLOYEES
Over 20 direct employees at the headquarters and several hundred indirect employees

WEBSITE
www.districlima.com
www.resdesurbanascaloyfrio.com

CONTACT
David Serrano, General Manager

LOCATION
22@ Technological District and Forum Area, Barcelona (Spain)

STAKEHOLDERS
Public authorities, town planners, users, manufacturers of goods and equipment, environment

RESOURCES
- Financial: over 50,000,000 €

MAIN AIM
- Design, construction and operation of an urban network in Barcelona for the supply of heat and cold for air-conditioning and hot water purposes for buildings, as part of an administrative concession until 2032. Progressive development connecting new buildings and providing new branches and connections for its growing presence in the territory

SPECIFIC AIMS
- Cost savings: 10% on clients’ energy bills
- Energy savings: 50% savings on fossil fuels
- Emission reduction: 10,900 t CO2

TAGS
Security of supply, waste management, smart grids

SECTOR PRODUCTION AND URBAN DISTRIBUTION OF HEAT AND COLD
Since 2004, the company, Districlima, S.A., with the participation of Cofely Spain SAU (Grupo GDF-Suez), Aguas de Barcelona, TERSA, ICAEN and IDAE, has operated the urban heat and cold distribution network in Barcelona, in the Forum Area and 22@ Technological District.

Thanks to its shareholders, administrations and clients, Districlima is currently the largest network in the country in terms of size, diversity of clients and implementation in the urban area of a large city.

Energy production takes place mainly in the Fòrum Plant, near the exhibition centre where the Forum of Cultures 2004 was held, which also gave rise to this project. Substantially all heat supplied as driven water at 90°C and a good part of the cold supplied as driven water at 5°C is produced from the steam from the neighbouring TERSA waste incineration plant. There is a second plant to meet peak demands and pumping requirements, which has been recently opened, namely in April 2012 and which is worth mentioning, due to its sophisticated ice accumulation system.

The Fòrum plant features two absorption units and four electric coolers (29 MWf in total), all condensed by seawater, and four steam - water exchangers (20 MWc) and a 20 MW back-up gas boiler.

The distribution network runs across the Besòs area and the 22@ technology district, supplying over 70 buildings of all kinds, from business parks, universities, social housing, health centres and hotels, to shopping centres, restaurants or office buildings.

Intangible benefits
The connected buildings benefit from increased energy efficiency ratings, gain useful spaces and make other architectural solutions possible, eliminate maintenance costs and future replacement of equipment; eliminate noise and vibration and the presence of combustible gases or hazardous elements; facilitate power increases with hardly any additional investment; and have supply guaranteed thanks to the large number of plants and equipment available. Another aspect to consider is that they always get the most economical and efficient energy, since they automatically benefit from the technological improvements and updates carried out at the plants.

Cities and the society, meanwhile, benefit from a minor dependence on foreign energy, the overall reduction in electricity consumption and the minimization of electricity and gas infrastructure; health risks are avoided; greenhouse gas emissions are reduced; smart cities are made up, architecturally avant-garde, with sustainable buildings that are technologically "updatable" in terms of heat production; it is possible to integrate various energy sources, also on a local level, which would otherwise be wasted, among others.

Lessons learned
The development of this type of projects in urban areas is closely linked to housing development and urban transformation and should be part of the planning from the beginning. Such long-term development rarely respects the original estimates so it is necessary to have a significant investment capacity, concessional-type entrepreneurial attitude and the involvement of several agents.

Thanks to this system, energy savings of 61,960 MWh PCI and a reduction in CO2 emissions of 10,900 t were achieved in 2011.
PROVISION OF ENERGY SERVICES FOR HEAT SUPPLY AND SUBSEQUENT USE IN THE HOT WATER CIRCUIT OF THE PROCESS, THROUGH THE CONSTRUCTION AND OPERATION OF A COGENERATION PLANT

SECTOR ENERGY

NUMBER OF EMPLOYEES
22,877

WEBSITE
www.endesaonline.com

CONTACT
Alexis Valero, Manager of Cogeneration Product and Large Client Thermal Installations
sei.cogeneracion@endesa.es

LOCATION
Los Rábanos, Soria (Spain)

STAKEHOLDERS
Clients

RESOURCES
- Financial: approximately 850,000 €
- Time: 14 months of various staff

MAIN AIM
- To improve energy efficiency in the industrial process of Cárnicas Villar by saving energy consumed in hot water production

TAGS
Savings plans, efficient resource management: measurement and control, rehabilitation and fitting-out of installations
Industrias Cárnicas Villar\(^1\) consumes a large amount of hot water in its production process. The hot water is usually produced by a boiler using natural gas as fuel.

The installation of a cogeneration plant would improve the energy efficiency of the process. Cogeneration is a highly efficient technology and from the primary energy provides both heat for the hot water circuit of the industrial process as well as electricity, which is transferred to the network, which enables the recovery of over 75% of the primary energy used.

Endesa comprises the provision of energy services in its energy efficiency strategy and reduced consumption for its clients, which includes the replacement of equipment and facilities by others of greater efficiency, the gradual reduction of energy consumption per production unit and the continuous improvement in facilities without affecting its normal activities nor reducing the quality and safety standards of each facility.

Specifically, in the comprehensive cogeneration service provided, Endesa assumes the financing of the project, procedures, execution of the work and its subsequent operation and maintenance. Having conducted the necessary audit and feasibility studies, it proposes the provision of a comprehensive cogeneration service. In this way, through an energy service contract, Endesa supplies the heat required for the industrial activity, reserving and minimizing the use of the boiler.

Meanwhile, the electricity generated by the cogeneration is fed into the medium-voltage network of the distribution company. The installation consists of a cogeneration plant with a 500 kWe alternative engine. The heat from the hot gases discharged from the engine and the heat from the engine jacket are recovered to produce hot water at about 90°C, about 530 kWt, which Endesa supplies to Industrias Cárnicas Villar at a more competitive price than if it were produced with a conventional system.

The simple recovery of investment for the Energy Services Company is achieved in approximately 4.5 years; meanwhile, Cárnicas Villar achieves a saving of 15% on its energy bill right from the start.

Furthermore, the replacement of conventional systems by cogeneration for heat production results in a saving of 4,257 MWh/year of primary energy.

The project started in January 2010 and implementation of the installation was completed in May 2011.

**Intangible benefits**

The outsourcing of the risks and responsibilities related to the construction and operation of the plant, increased competitiveness due to the reduction of energy costs, especially in sectors with intensive energy consumption, and contribution to CO\(_2\) emission reduction, energy savings and consequent reduction of energy dependence.

**Lessons learned**

The food sector has great potential for the implementation of cogeneration plants; cogeneration plants should be designed to meet the basic demand for thermal energy, an essential criterion for a high level of overall efficiency; cogeneration is a highly efficient system which allows an improved competitiveness of companies with significant thermal energy consumption; installation is easily replicable and adaptable to any heat consumer.

\(^1\) An organization involved in the manufacture of meat products which operates in Spain
ENERGY EFFICIENCY AND PRODUCTIVITY BY OPTIMIZING THE MANAGEMENT OF COMPRESSED AIR LEAKS

SECTOR CHEMICALS, PAPER, PLASTICS, METAL, GLASS

NUMBER OF EMPLOYEES
746
WEBSITE
www.ferro.com
CONTACT
Felipe Valls, Head of Plant Engineering
ferrospain@ferro.com
STAKEHOLDERS
Employees, clients, society, environment, suppliers
RESOURCES
- Financial: 22,000 €
- Time: 300 hours

MAIN AIM
- To locate possible leaks in the compressed air distribution network, thereby avoiding energy loss
SPECIFIC AIMS
- Cost savings: 140,000 €
- Energy savings: 1,300,000 kWh
- Emission reduction: 500 t CO₂

TAGS
Security of supply, efficient resource management: measurement and control
**Intangible benefits**

It has been possible to sensitize employees on environmental issues, minimize maintenance of equipment (compressors), reduce the time of equipment out of service and increase production capacity.

**Lessons learned**

1. Through leakage control, equipment maintenance deficiencies are corrected.
2. Without excessive work by the company itself some improvements can be detected without the need for investment, related to compressed air leakage management (immediate results).
3. Promoting communication channels that facilitate the management of expert knowledge.
4. Informing company staff of the high production cost of compressed air.
5. The fewer leaks, the less the unnecessary work of compressors, discharge time, energy consumption, number of repairs required by the equipment and number of shut-downs.

**Air is free** until it is compressed. Once compressed, it becomes energy and this has a cost. Therefore, when there are leaks in compressed air pipes we are talking about economic losses.

**Compressed** air systems are present in most industries, as they improve productivity by automating and accelerating production. Compressed air represents approximately 10% of all electricity used at industrial level and it is present in almost all industrial facilities.

**Therefore,** the main aim of the project which is carried out by Ferro Spain is the location of possible leaks in the compressed air distribution network. Experts say that the acceptable level of leakage would be between 5% and 10%, since it is sometimes as high as 30%.

**The project** is divided into two phases. The first involves the analysis and identification of areas for improvement that require a small investment. To do this, it is necessary to locate the air tubes or branch lines which are not in use currently, as these tend to be a potential source of leakage. The second phase involves the implementation of an effective system to detect leaks and repair them immediately.

**With regard** to cost management, this project is segmented into two parts: the cost of detecting compressed air leaks with specialized equipment and the cost of repairing them. The return on investment time is always less than one year.

**With this practice,** the company achieves energy savings of 700,000 kWh, cost savings of 70,000 € and an emission reduction of 250 t of CO₂.
HEAT RECOVERY FROM BREWHOUSE VAPOURS

NUMBER OF EMPLOYEES
2,607

WEBSITE
www.mahou-sanmiguel.com

CONTACT
Víctor Rodrigo, Head of Engineering
vrodrigo@mahou-sanmiguel.com
José Luis García, Head of Environmental Management
jgarcia@mahou-sanmiguel.com

LOCATION
Alovera Factory (Spain)

STAKEHOLDERS
Suppliers, production

RESOURCES
- Economic: 1,600,000 €

MAIN AIM
- To reduce the energy consumption of the factory, lowering the consumption rate by over 13%

SPECIFIC AIMS
- Cost savings: net annual cost reduction of over 600,000 €
- Energy savings: 22,000,000 kWh/year
- Emission reduction: 4,433 t of CO₂/year

TAGS
Waste management, savings plans, security of supply
The opportunity is identified to tap the latent heat of the vapours from the boiling of must which is lost through the chimneys of the boilers, by condensing them to preheat the must and to generate water at 85°C. This makes it possible to reduce energy consumption and thus emissions to the atmosphere.

Specifically, Mahou-San Miguel achieves cost savings of over €600,000 a year, energy savings of 22,000,000 kWh PCS a year, and a reduction in CO2 emissions of 4,433 t a year.

It also reduces the peak heat demand of the factory and, consequently, increases the security of supply since there is a greater installed capacity in reserve to cover boiler breakdowns or maintenance. The emission of unpleasant odours propagated by brewing vapours is also reduced by 60%.

Lessons learned
Simply by using what is allowed to escape through a chimney it is possible to reduce energy consumption and hence emissions to the atmosphere. The simplest things can often be the most profitable.

“SECURITY OF SUPPLY INCREASES BECAUSE THERE IS A GREATER INSTALLED CAPACITY IN RESERVE”
IMPROVED ENERGY MANAGEMENT AT THE HEADQUARTERS OF RED ELÉCTRICA DE ESPAÑA

NUMBER OF EMPLOYEES
1,641

WEBSITE
www.ree.es

CONTACT
Mónica García, General Service Technician
mgarcia@ree.es

LOCATION
Red Eléctrica de España, S.A.U.
Headquarters, Alcobendas

STAKEHOLDERS
Employees, suppliers, visitors

RESOURCES
- Financial: 185,970 €
- Time: 1,056 hours

MAIN AIM
- To integrate energy efficiency in the management of the processes and activities of the headquarters of Red Eléctrica de España, S.A.U., in la Moraleja

SPECIFIC AIMS
- Cost savings: 30,882 €
- Energy savings: 354,139 kWh
- Emission reduction: 124 t CO₂

TAGS
Rehabilitation and conditioning of installations, efficient resource management: measurement and control

SECTOR
ELECTRICITY, GAS, OIL, BY-PRODUCTS
In November 2011, the international version in energy management systems, EN ISO 50001:2011, is adopted as a Spanish standard, replacing the current UNE-EN 16001:2010.

The new approach of the UNE-EN ISO 50001:2011 standard seeks alignment with the regulatory provisions that have been applied at international level in recent years, therefore, also in the framework of the EU, to fight against climate change, one of whose main causes lies in the emission of greenhouse gases caused directly power generation and consumption activities.

Therefore, Red Eléctrica de España, S.A.U., which since October 2011 has been certified by AENOR in the Energy Management System-SGEn- under the UNE-EN 16001 GE-021/2011 standard, sets itself the goal of being certified according to the new standard, for which it is implementing the “Plan of Energy Management Improvement Measures at its Headquarters for the period 2012 - 2019”.

This savings programme includes, among other measures:

- Lighting: implementation of a lighting control system in areas for administrative use; installation of non-adjustable electronic ballasts in areas for administrative use; replacement of fluorescent lamps in basement car parks; reduced voltage in outdoor lighting; presence sensors in toilets; presence sensors in basement lift core; reduced lighting in computer rooms by means of switches; light sensors in offices; reduced lighting hours in lifts.
- HVAC: replacement of autonomous equipment with more efficient equipment.
- Water: implementation of green Cold Opening cartridges in mono-control taps.
- ACS: installation of a solar thermal collection system.
- Pumps: variable speed drives on booster pumps.
- Motors: replacement of standard motors by others with improved efficiency; installation of variable speed drives in lifts.
- Office Automation: installation of smart power strips.

Specifically, this project is expected to result in cost savings of 30,882 € a year, energy savings of 354,139 kWh a year, and a CO2 emission reduction of 124 t a year.

Intangible benefits
Increased knowledge of the consumption profile of the headquarters and identification of potential savings and proposed improvement actions for the potential identified, e.g. identification of savings in stand-by and proposal of smart power strips.

Lessons learned
There are improvements in energy consumption as a consequence of the introduction of more efficient equipment without impairing user comfort. In addition, it contributes to the awareness of employees about the importance of energy efficiency in the workplace.
IMPLEMENTATION OF AN ENERGY MANAGEMENT SYSTEM

VOLKSWAGEN NAVARRA

Volkswagen Navarra, S. A.

SECTOR AEROSPACE, AUTOMOTIVE, MOTORWAYS

NUMBER OF EMPLOYEES
4,500

WEBSITE
www.vw-navarra.es

CONTACT
Francisco Rodriguez, Head of Painting Maintenance and General Coordinator of Energy
paco.rodriguez@vw-navarra.es
Juan San Miguel, Head of Maintenance and Facilities
juan-jose.san-miguel@vw-navarra.es
Ana Amatriaian, Head of Production System and Logistics
ana.amatriaian@vw-navarra.es

LOCATION
Volkswagen plant in Landaben (Spain)

STAKEHOLDERS
Employees

RESOURCES
- Financial: 300,000 €

MAIN AIM
- To implement an information system to provide precise, detailed information on the energy consumers of the plant in order to take technical and organizational measures aimed at reducing energy consumption

SPECIFIC AIMS
- Cost savings: Over 168,400 €
- Energy savings: 5,139,000 kWh/year
- Emission reduction: 1,241.08 t CO2/year

TAGS
Efficient resource management: measurement and control, solutions for reducing energy consumption in buildings, carbon footprint
Lessons learned

**Detailed knowledge of the influence of each facility on energy consumption allows the definition of realistic consumption targets.**

Meanwhile, the quantification of the actual savings achieved in the implementation of measures is a motivating factor for the definition of new measures.

**Volkswagen** has installed hardware consisting of electric and gas meters in all areas of its plant in Landaben that it wishes to control, PLC and servers. With this system, each user can know the real influence of each element and operating times in the energy consumption of his facility or workshop. This information, for each of the facilities, is sent automatically to a single information system for further analysis.

**This is used** to select the periods and facilities where a greater potential for reducing consumption is identified and define the necessary technical and organizational measures. For these cases, stop and start times or operating conditions of these facilities could be shaped.

**This work** of analysis and modification of operating conditions is performed weekly to see how it affects consumption, since the system permits verification of the actual reduction in consumption following implementation.

**Specifically,** this project has provided Volkswagen with costs savings of over 168,000 €, energy savings of 5,139,000 kWh /year, and a reduction in CO2 emissions of 1241.08 t /year.