





hc energía

a better energy, a better future, a better world

## About the Report

"a better energy,  
a better future,  
a better world"...

**This is the motto for HC ENERGÍA's Sustainability Report 2011**, in which the most significant initiatives undertaken by the Group over the past year are detailed, covering all three aspects of sustainable development: **financial, social** and **environmental performance**.

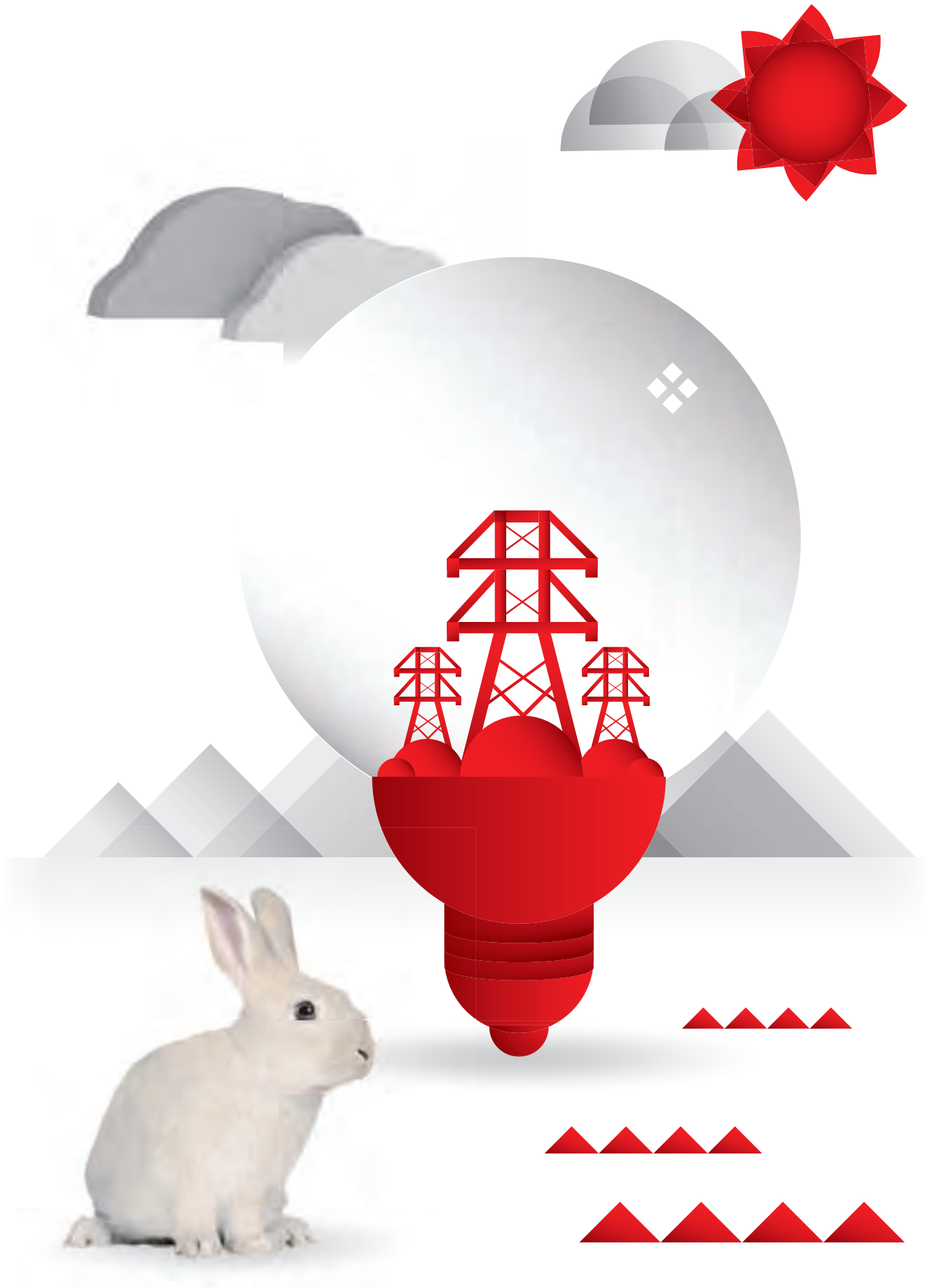
A materiality analysis has been conducted to select which corporate responsibility issues are most relevant to our stakeholders and the contents to be included in this report have been selected accordingly.

Ever since the first Sustainability Report was published back in 2003, we have always strived to best communicate the company's corporate strategy in this field.

**In 2010 these efforts were channelled into creating a new website exclusively aimed at providing information on sustainability-related projects.** This page was remodelled in 2011 with the intention of giving it a more modern look and integrating the company's new initiatives:

[www.sostenibilidad.hcenergia.com](http://www.sostenibilidad.hcenergia.com)







# Introduction

In a year shadowed by an atmosphere of national and international uncertainty, HC ENERGÍA has managed to increase its EBITDA to 676 million Euros, mirroring levels recorded in 2009. This has been achieved thanks to a convenient hedging policy for commercialisation and generation, efficient and available power plants, and rigorously applied regulated activities.

## 2011 has been a year of milestones for HC ENERGÍA

### Quality

We have achieved our **best-ever quality of supply index for the fourth year running, with a TIEPI (System Average Interruption Duration Index) of 39 minutes**. Both investments and procedures enable the company to continue to act as a leading force for quality of service in the Spanish power supply industry.

### Economic conditions

Despite challenging economic conditions and a larger number of competitors, **over 21,000 GWh were supplied**, with a market share of 12% in the liberalised market.

### Sustainability

As a result of its dedicated focus on Sustainability –one of its corporate values- this year not **only has the company ensured that the environment is protected in its power plants, but it has also been achieved an environmental management certificate** for its electricity supply activities; a milestone rewarding the company's efforts in quality and environmental awareness.

### Health and Safety

As part of its commitment to Health and Safety, **Soto de Ribera's combined-cycle power plant has also been achieved a certification in accordance with OHSAS 18001:2007 international standard, just like Castejón power plant**, which pioneered this certification in 2009.

### EFR Certificate

**The Family-friendly Company certificate** was awarded by Fundación Más Familia in cooperation with the Spanish Department of Health and Social Policy.

### R&D&I

In line with its R&D&I strategy, partnership **agreements have been signed with several car manufacturers** in order to jointly boost the electric car industry. Furthermore, **it has continued to expand its electric vehicle recharging points' network**, in accordance with the company's strategic plan.

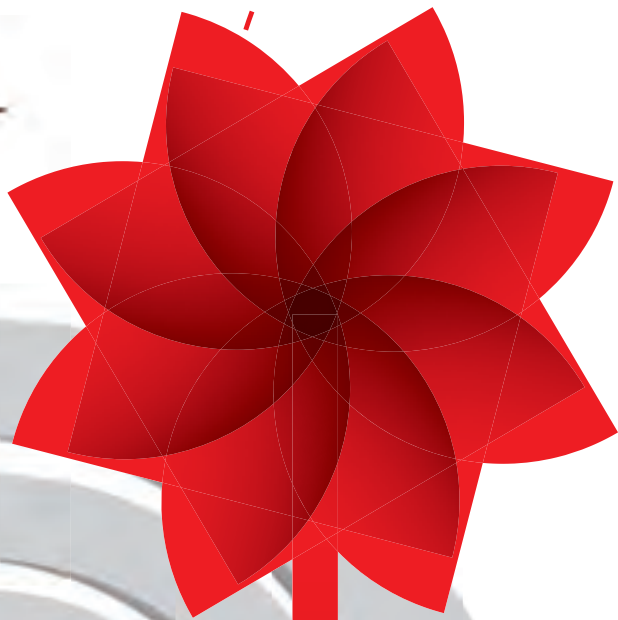
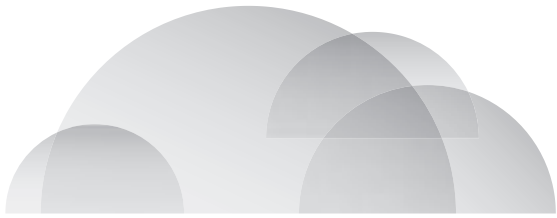
### Environment

Environmental protection continues to be one of HC ENERGÍA's FOUNDATION priorities, which is why a **new agreement has been signed to plant native trees over the next three years**. A total of 30,000 more trees will be planted in the future, adding to the 40,000 which have already been planted in various areas in Asturias.

### Education

Moreover, HC ENERGÍA FOUNDATION developed an education project to teach little ones to be aware of the environment and act responsibly. **20,000 kids all over Asturias and the Basque Country participated in the "Viva nuestra energía" programme in 2011**.

Achieving all of these milestones would not have been possible without the hard work of over 1,200 employees from HC ENERGÍA, and the enthusiastic support of EDP GROUP's General and Supervisory Board, and its Executive Board of Directors.



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• Joaquín Vaquero Palacios.  
*Wall painting with magnetic fields in engine room.*  
PROAZA'S HYDROELECTRIC PLANT.

# January / June

## January

### Electric Vehicle

A partnership agreement was signed with Toyota to boost the plug-in hybrid vehicle.



## February

### A customer, a tree

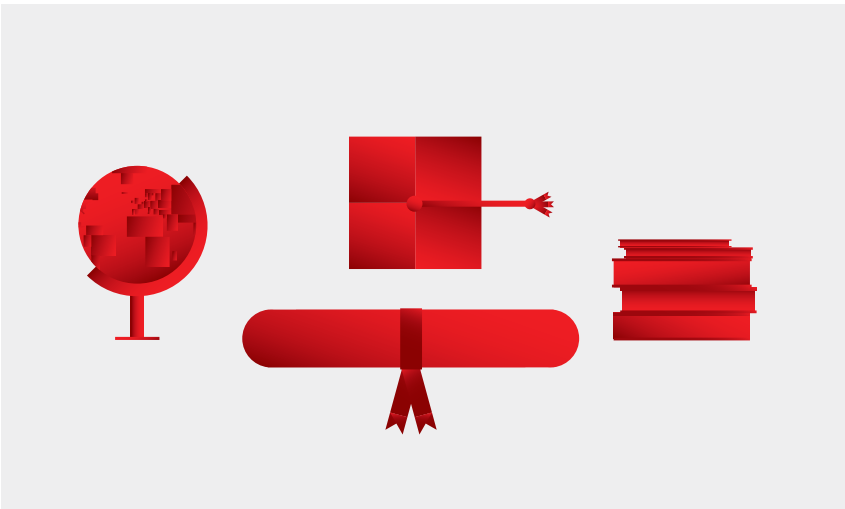
40,000 trees were planted within the framework of the "Un cliente, un árbol" programme ("A customer, a tree"), which enables the plantation of a tree for every new customer and e-invoice.



## March

### Postgraduate Student Support Programme

The third postgraduate student support programme was launched.





# 2011



## April

Visits from Little Ones

An initiative to invite employees' children to visit their parents' workplace was implemented in La Corredoria.



## May

¡Viva Nuestra Energía!

¡Viva Nuestra Energía! (Long Live our Energy!) reached the city of Murcia, giving little ones the opportunity to learn the origin of energy and some recommendations about energy efficiency.



## June

A Day in the Open Air

The Nature Party was celebrated, with the participation of over 5,000 customers and employees, who spent the day in the open air and took part in nature themed activities.

# July / December

## July

### Trainees

Trainees from 2011 were awarded certifying diplomas in a special ceremony.



## August

### FIDMA

HC ENERGÍA joined the Asturian International Trade Exhibition (FIDMA), using the motto "La Ruta de la Energía" (The Energy Route). Visits to our pavilion increased by 12% compared to those in 2010.



## September

### Micro-generators

In co-operation with the Principality of Asturias, we operated the first four electric-power micro-generators in residential buildings in Roces area (Gijón).





# 2011



## October

### Conference

Over 100 people participated in the conference "Con ciencia en la energía" (play on words in Spanish that could be reproduced in English as "Conscientious about Energy"), in which the main advances in the energy sector were presented.



## November

### Recycling

We actively participated in the European Week for Waste Reduction, organising, amongst other things, a recycling workshop for little ones.



## December

### Satisfaction

We achieved our best-ever results in our employee satisfaction survey.



# HC ENERGÍA Group

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HC ENERGÍA has been leading the energy industry in Asturias since 1920. Over the years, we have expanded our operations all over Spain, taking on new offices and facilities.



\* Joaquín Vaquero Palacios.  
*Embossed antique symbols about man and nature on the main front.*  
PROAZA'S HYDROELECTRIC PLANT.

# Introduction

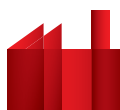
HC ENERGÍA is a group of companies owned by the Portuguese EDP, S.A., Branch in Spain, the majority shareholder, owning 96.6% of company shares. The remaining shares mainly belong to the Caja de Ahorros de Asturias (3.14%). The Group's parent company is Hidroeléctrica del Cantábrico S.A., which is based in Oviedo, Asturias.

The Group HC ENERGÍA core activity is the production, distribution and commercialisation of electricity, also providing technical support for energy saving and diversification.

This diversification approach can also be seen in our majority shareholding (95%) of Grupo Naturgas –to develop gas supply business– and a smaller participation in EDP Renewables (15.5%) –to strengthen wind power generation.

HC ENERGÍA dates back to 1920, when Sociedad Anónima Hidroeléctrica del Cantábrico - Saltos de Agua de Somiedo, was created. **We have been at the forefront of the energy industry in the region ever since.** In Asturias, the company currently has an electrical installed capacity over 2,800 MW, including a network with more than 21,000 kilometres to supply electricity to customers. The Group is therefore responsible for nearly 88% of the electricity supply points in the region and 90% of the overall energy demand.

Since the electricity sector was de-regulated in 1998, we have been expanding our operations all over Spain, which has meant opening new offices, and constructing and taking on new generation and distribution facilities.



## GENERATION

Asturias  
Guadalajara  
Jaén  
Murcia  
Navarra  
País Vasco  
Soria  
Toledo  
Valladolid



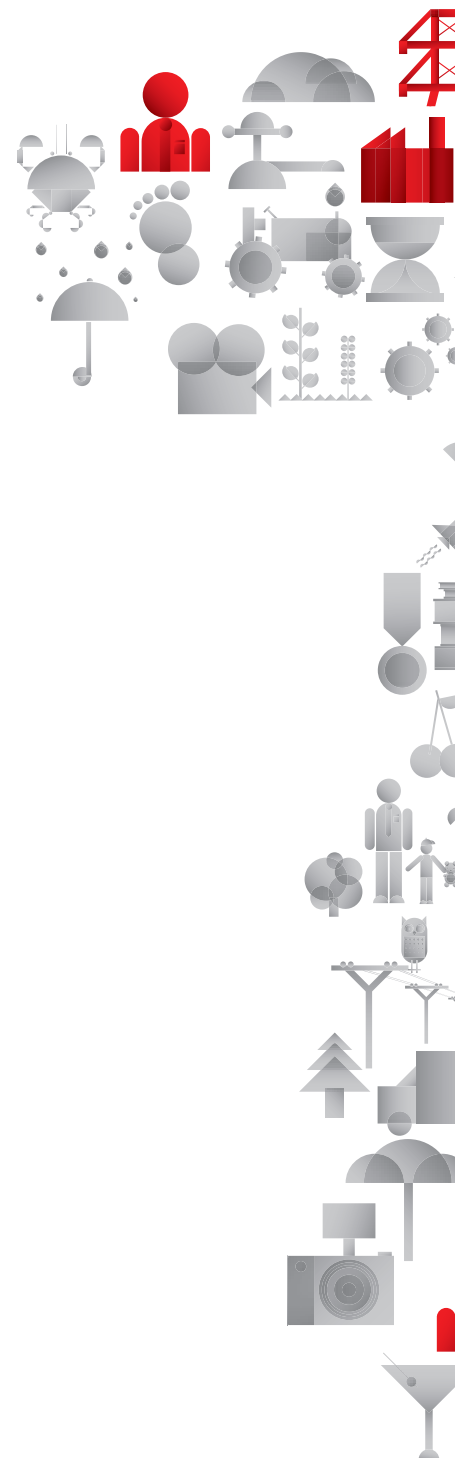
## DISTRIBUTION

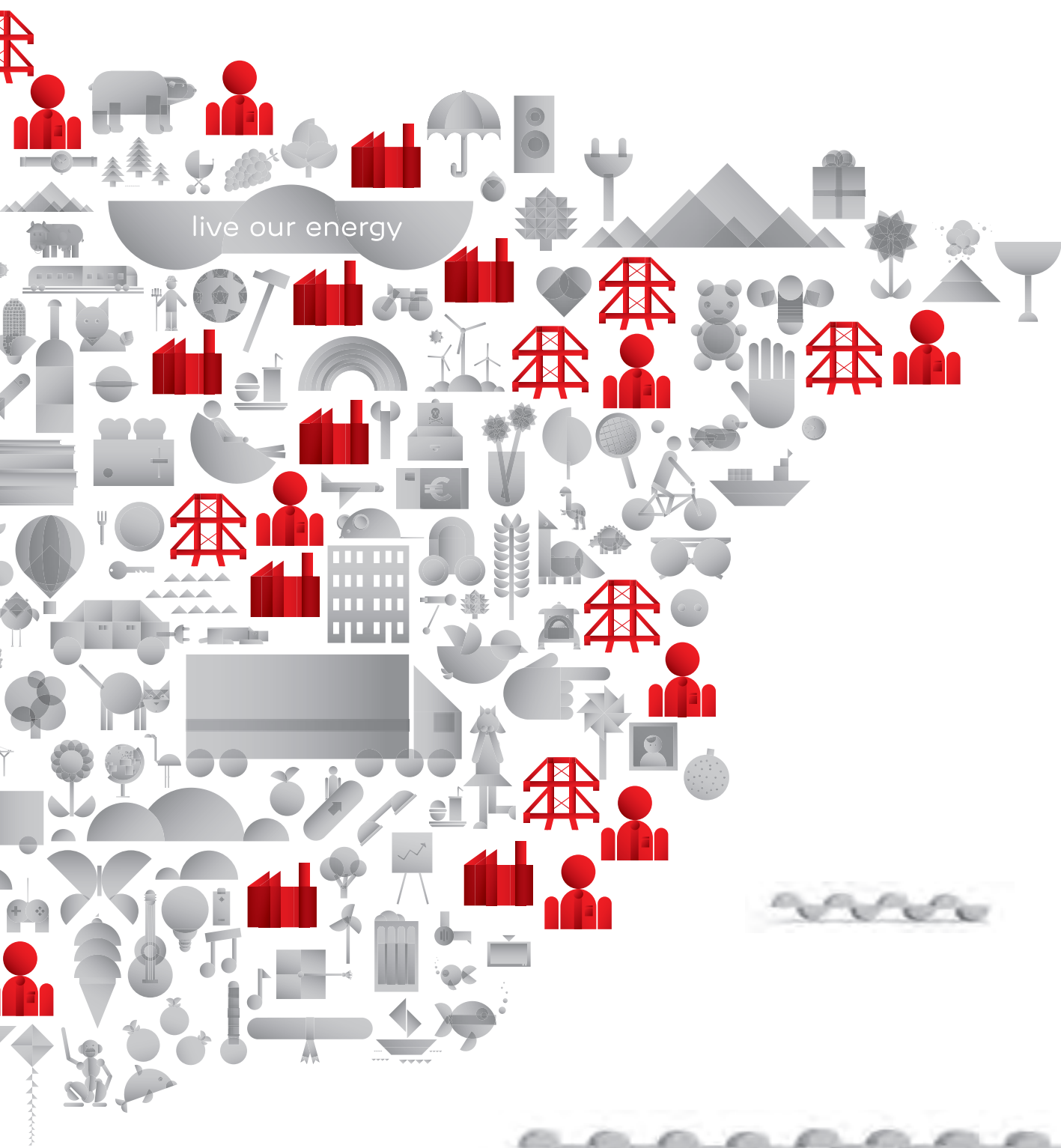
Alicante  
Asturias  
Barcelona  
Huesca  
Madrid  
Valencia  
Zaragoza



## COMMERCIALISATION

Alicante  
Asturias  
Barcelona  
Cantabria  
La Coruña  
Madrid  
Murcia  
Sevilla  
Valencia  
Zaragoza





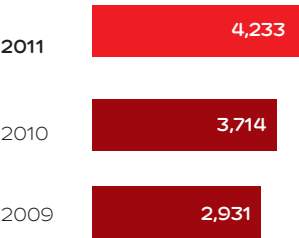
900 907 000  
[www.hcenergia.com](http://www.hcenergia.com)


HC ENERGÍA's overview

BUSINESS

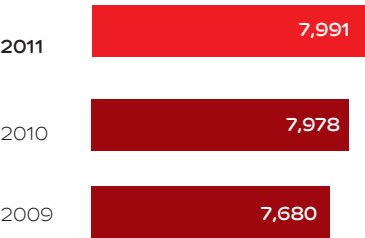
TURNOVER		
2011	4,233	↑14%
2010	3,714	

Million Euros



TOTAL ASSETS		
2011	7,991	
2010	7,978	

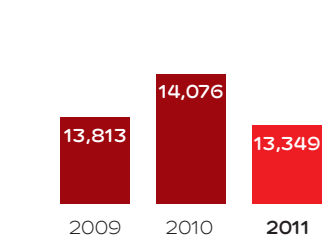
Million Euros



ENERGY

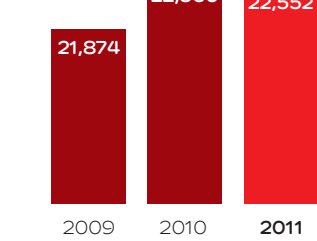
NET ENERGY OUTPUT		
2011	13,349	
2010	14,076	

Net GWh



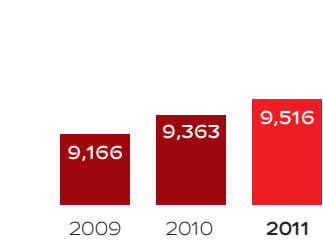
DISTRIBUTION LINES		
2011	22,552	
2010	22,560	

km



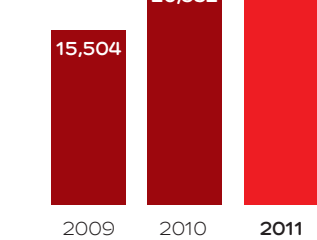
SUPPLIED		
2011	9,516	
2010	9,363	

GWh



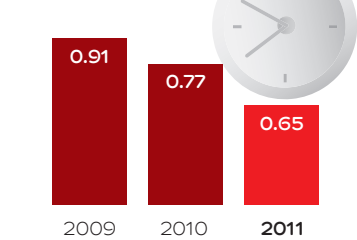
COMMERCIALISED		
2011	20,591	
2010	20,532	

GWh



SUPPLY QUALITY		
2011	0.65	
2010	0.77	

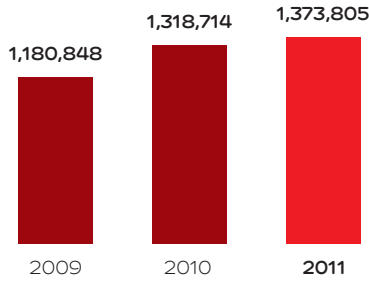
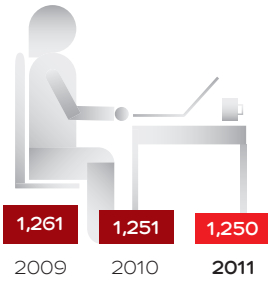
TIEPI in hours



EMPLOYEES AND CUSTOMERS

NUMBER OF EMPLOYEES	
2011	1,250
2010	1,251

NUMBER OF CUSTOMERS	
2011	1,373,805
2010	1,318,714



On December 31st

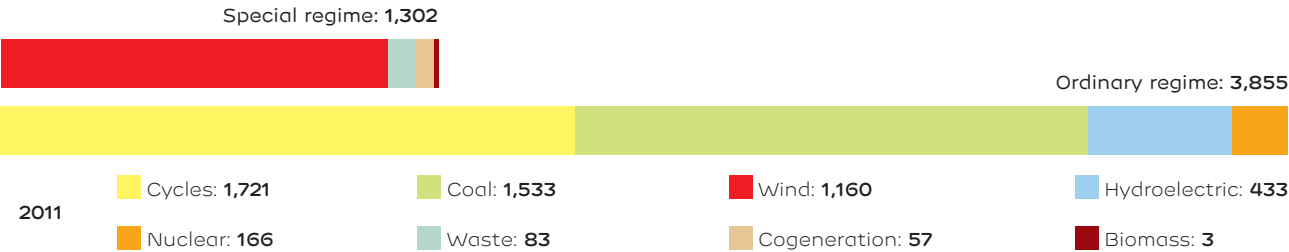
Supply points

INSTALLED CAPACITY

ORDINARY REGIME	
2011	3,855
2010	3,855
2009	3,421

SPECIAL REGIME	
2011	1,302
2010	1,177
2009	1,014

Gross MW



MARKET SHARE

GENERATION	
2011	6.0
2010	6.1
2009	6.2

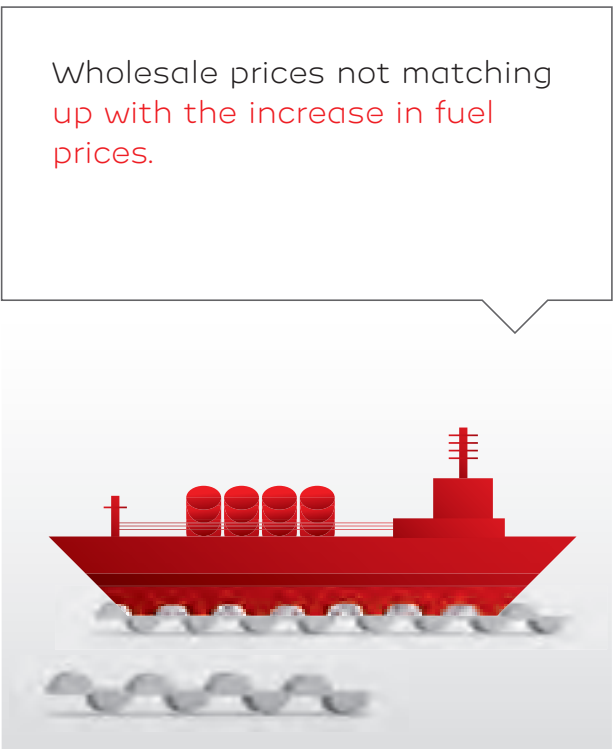
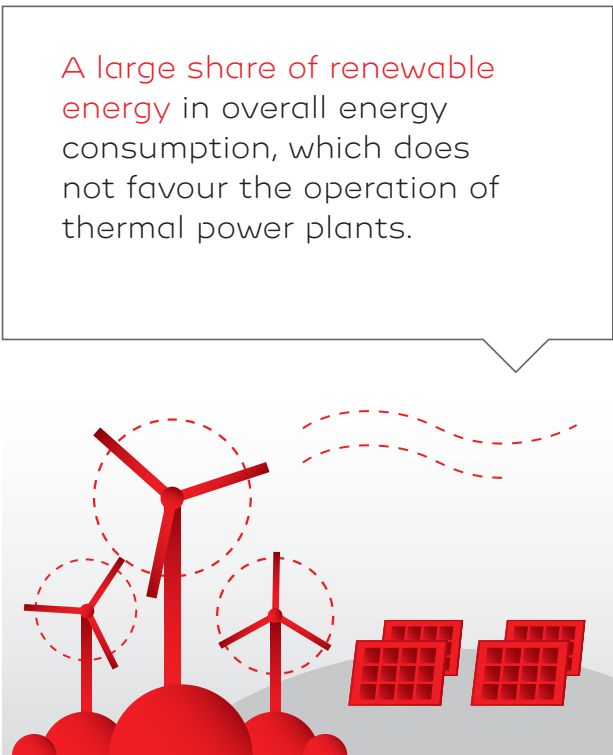
DISTRIBUTION	
2011	4
2010	4
2009	4

COMMERCIALISATION	
2011	12
2010	12
2009	11



## Economic performance

2011 was shaped by very tough **market conditions** in the electricity sector:



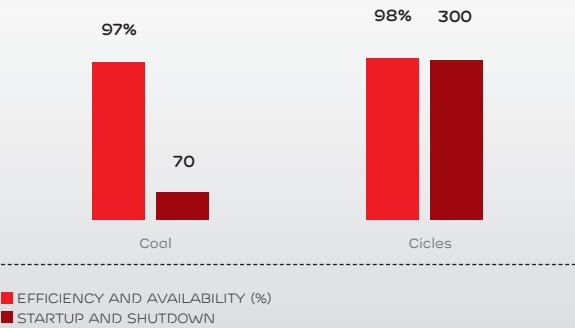
Despite these challenges, HC ENERGÍA managed to increase EBITDA by 20%, compared to those of 2010 –a rather poor financial year for the company– to 676 million euros. The most relevant goals of this **outstanding performance** are the following:

Customer portfolio optimisation based on an efficient combination of both generation and commercialisation businesses.



An efficient and widely available power plants (97% in coal and 98% in combined cycles) with fully flexible operation (considerable number of startup and shutdown periods, 70 in coal and over 300 in cycles).

EFFICIENCY AND AVAILABILITY OF THE POWER PLANTS



A rigorous and efficient electrical supply (best-ever quality of supply index, with a TIEPI of 39 minutes).



A strong cost-control policy and the optimisation of synergies with the majority shareholder: EDP.

INCOME STATEMENT AND FINANCIAL DATA				
	2011	2010	2009	2011/2010
Income statement				
Turnover	4,233	3,714	2,931	14 %
EBITDA	676	564	648	20 %
Net profit (after tax)	217	83	223	161 %
Financial data				
Net financial debt	2,536	2,708	2,453	-6 %
Financial Leverage	47 %	50 %	45 %	
Figures in million Euros.				



## Ethics

Any action taken by the companies, Top Management or employees, can have a positive or negative impact on their relationship with stakeholders, particularly with employees, shareholders, customers and suppliers.

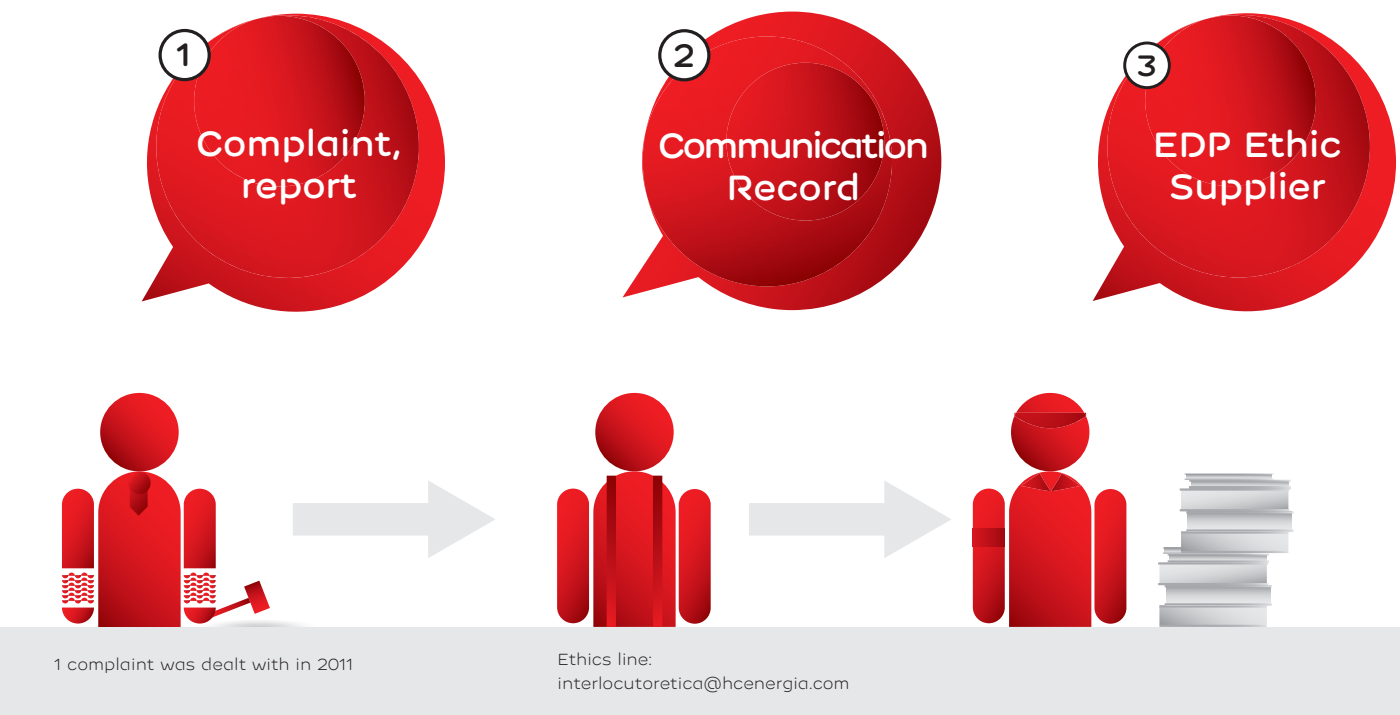
Just as individuals take an ethical approach to their decision making, **“Corporate ethics” are a set of values, norms and principles ruling the company’s actions, which constitute a code of conduct for all its members.**

## Code of ethics

HC ENERGÍA’s Code of Ethics explains the company’s values (Excellence, Initiative, Sustainability, Innovation and Trust) and touches on the following issues:

- **Legislation and ethics:** The commitment to abide by the legislation is reinforced.
- **Workplace behaviour:** Values such as transparency, honesty and integrity within the team are emphasised so as to create and maintain a good working environment, and promote human capital development.
- **Respect of Human Rights:** Basic and universal. Respect of equal opportunities for all team members is also essential.
- **Integrity in decision-making:** Corrupt practices and bribery are expressly forbidden.
- **Relationship with customers and suppliers:** Based on principles of respect of rights.
- **Environment and sustainability:** Relevant variables which require consideration when making decisions.

The practical application of the code is stated in the Internal Regulations:



At the same time, **all aspects dealt with in the Code are developed into specific initiatives, such as the adherence to UN Global Compact**, involving revision and transparent information (Communication on Progress, CoP) about company practices related to human and labour rights, environmental management and the fight against corruption. **Highlights HC ENERGÍA's 2011 CoP which was featured in the Global Compact's Notable CoP Programme. This distinction identifies and implements good practices in management and governance.**

## Integrity

The Department of Internal Audit and Risk Assessment carries out an objective and independent assessment of the Group's activities and its System of Internal Control over Financial Reporting, which started operating in HC ENERGÍA in 2005. This system allows the company to:

- **Enhance the efficiency and effectiveness of procedures**, both in operations and in the internal control of the Group's companies.
- **Improve internal and external reporting** of financial information.
- **Strengthen reliability and credibility** among company shareholders and stakeholders.

## Free competition

HC ENERGÍA's activities are regulated by the Public Administration (Transmission and Distribution), which is why, under the Electricity Sector Act, there is a Code of Conduct (approved in December 2007). This Code guarantees the independence of these activities and ensures there is no discrimination, allowing for competition and the effective operation of the market.

Four legal proceedings are currently underway (two of them are court cases and the remaining two are enquiry procedures) regarding alleged non compliance with the Competition Act. Moreover, three more disciplinary actions were taken and concluded in 2011 (two administrative causes and one enquiry).



# Stakeholders

## What are stakeholders?

Stakeholders are individuals or legal entities with whom HC ENERGÍA carries out business, works or cooperates. This includes collaborators, customers, suppliers, counterparts, partners or members of the community with whom HC ENERGÍA operates and who may demonstrate a genuine interest in the transparency, dialogue and ethical behaviour of the Group and its collaborators.

## Identifying HC ENERGÍA's stakeholders

Being an energy utility, as a basic and regulated activity, involves that both **Customers and the Public Administration and Regulatory Bodies** are two of the main Stakeholders. Moreover, the environmental impact of power plants and distribution facilities make **Society**, both on a global level and within the specific communities where we operate, a very important stakeholder for the company. Finally, our **shareholders** (EDP Group and Cajastur), **Employees** and **Suppliers** complete the list of stakeholders to whom the company is committed.

## How do we communicate with our Stakeholders?

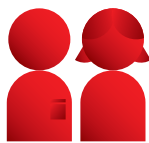
Communication enables a company to inform stakeholders about activities and their consequences whilst simultaneously listening and responding to their demands and expectations in an effort to constantly improve its operations.

## Suppliers



- How we listen**
- Area for suppliers on website (permanently).
  - Re-Pro (permanently).
- Communication**
- Website (permanently).
- Bidirectional**
- Prevention and environment meetings (six-monthly).

## Customers

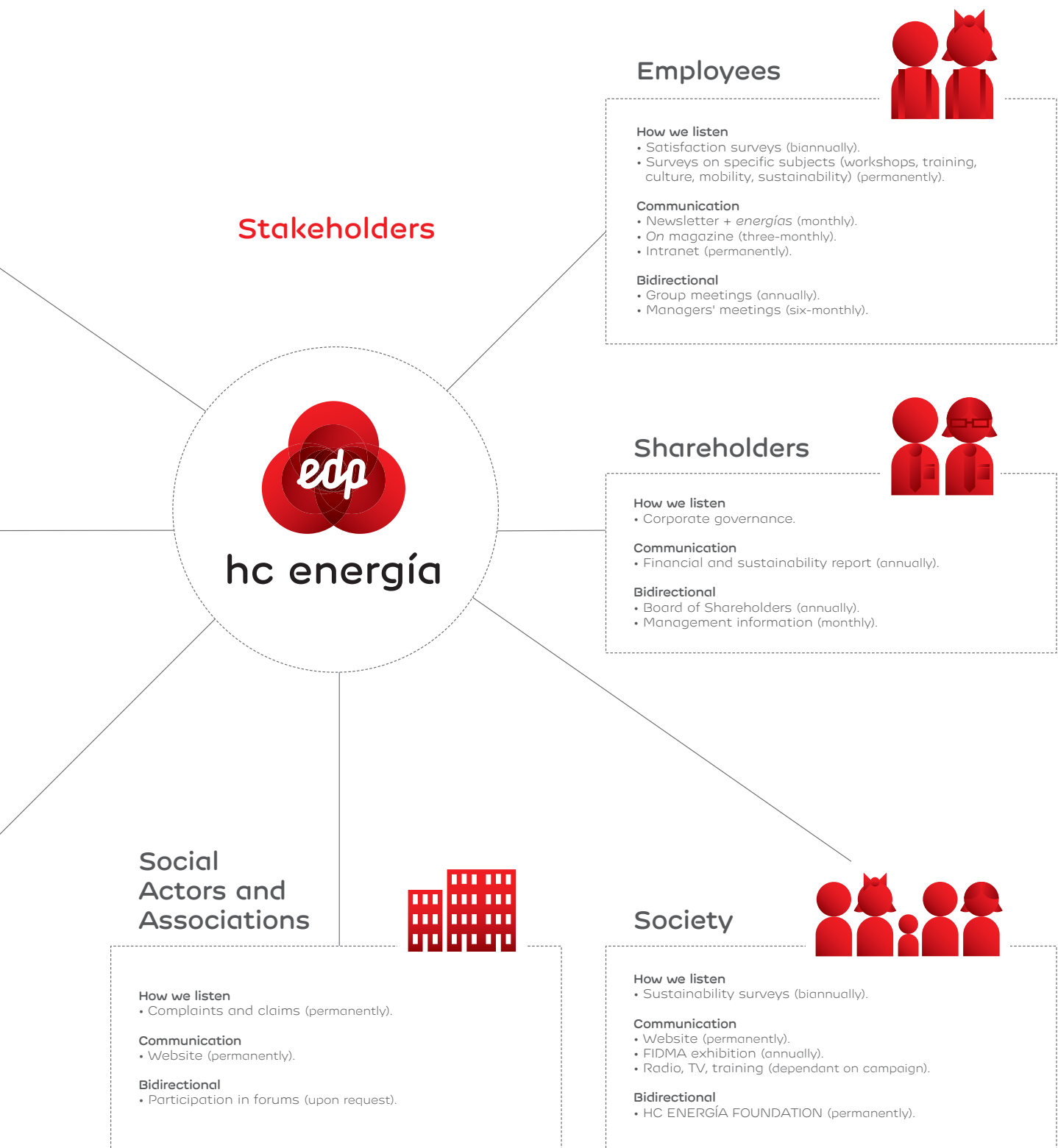


- How we listen**
- Commercial offices (permanently).
  - Market research (dependant on the research: monthly, annually, biannually).
  - Satisfaction surveys (annually).
- Communication**
- Mailing, advertising (with campaigns).
  - Sent invoices (monthly).
  - Newsletter *Empresa + Energía* (three-monthly).
- Bidirectional**
- Regional offices (permanently).
  - Customer Service Centre (permanently).
  - Website (permanently).

## Public Administration



- How we listen**
- Legislation (permanently).
- Communication**
- Regular information (monthly).
- Bidirectional**
- Regulation Department (permanently).



# Corporation

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Hidroeléctrica del Cantábrico, S.A.  
is HC ENERGÍA's parent company and  
is in charge of the production, distribution,  
transmission and commercialisation  
of electrical power.



\* Joaquín Vaquero Palacios, Joaquín Vaquero Turcios.  
*Wall painting: Construction works of Salime's Hydraulic Jump.*  
SALIME'S HYDRAULIC POWER PLANT.

## Introduction

Hidroeléctrica del Cantábrico, S.A. is HC ENERGÍA's parent company and the Group's main activities centre on the production, distribution, transmission and commercialisation of electrical power.

Within this structure, HC ENERGÍA has set up two joint ownership arrangements with the objective of managing Salime's Hydraulic Power Plant –of which it owns 50%– and Trillo's Nuclear Power Plant –of which it owns 15.5% of the shares.

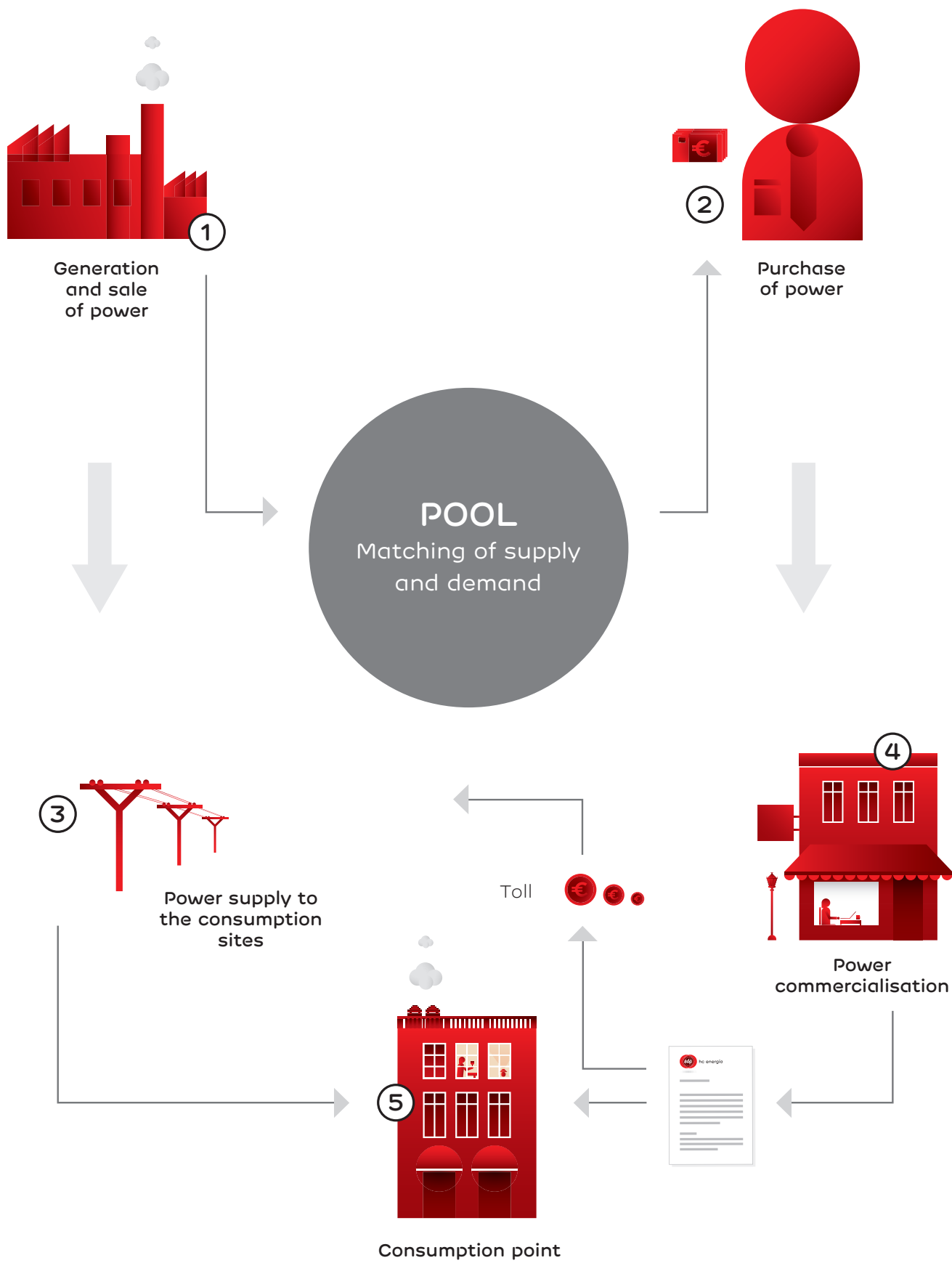
The companies responsible for **Generation** own the electric power plants under the Ordinary Regime and the Special Regime. The difference between them is that the latter's plants installed power is less than 50 kWe and that electrical power is generated through high-efficiency cogeneration, or the use of a renewable energy or wastes as the main source of energy, allowing them to be temporarily competitive in a free market. All generating facilities freely sell their electrical power production on the market.

HC ENERGÍA's facilities, operating under the **Ordinary Regime**, are the conventional Thermal Power Plants and the Combined-Cycle Thermal Power Plants, where coal and natural gas are used as the main fuel, respectively. This also includes Hydraulic Power Plants. The facilities operating under the **Special Regime** not only produce electricity, but they also generate steam or heat, for which they need a partner (cogeneration), such as Arcelor-Mittal, Tudela Veguín or the Oviedo and Valle del Nalón hospitals. This scheme also regulates waste treatment plants (olives and pig mature wastes); where heat is used to dry the waste in order to produce fuel pellets or fertilisers. Any unused electric power produced in these types of facilities, is then fed into the grid.

The electrical energy produced in our power plants is taken to consumption sites through the network. Companies dealing with the **Supply area** are in charge of the operation and maintenance of these lines to ensure that the supply is not interrupted. Moreover, they design and construct new grids to deal with new supply requests from our customers.

As a result of the reforms and the de-regulation in the electricity sector, customers can decide which electric power supplier they want and, therefore, select the best value provider, even if they are physically connected to the supply grid of another company. In HC ENERGÍA, management of the customer portfolio as well as the development of all activities involved in the commercial cycle is performed by **Commercialisation** companies. As compensation for the use of electric grids, the commercialiser's invoice to the customer includes an access toll to pay for the regulated supply.

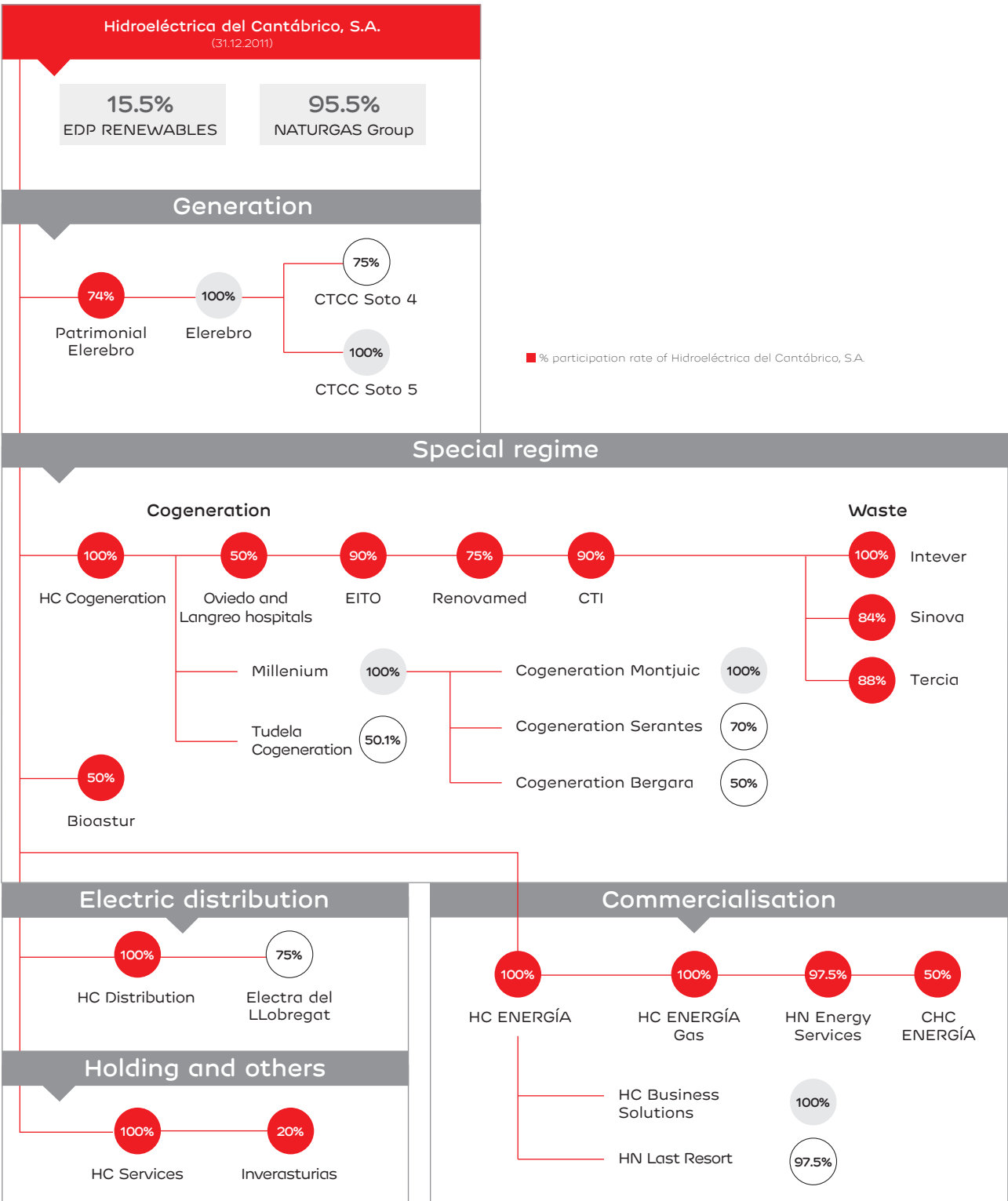






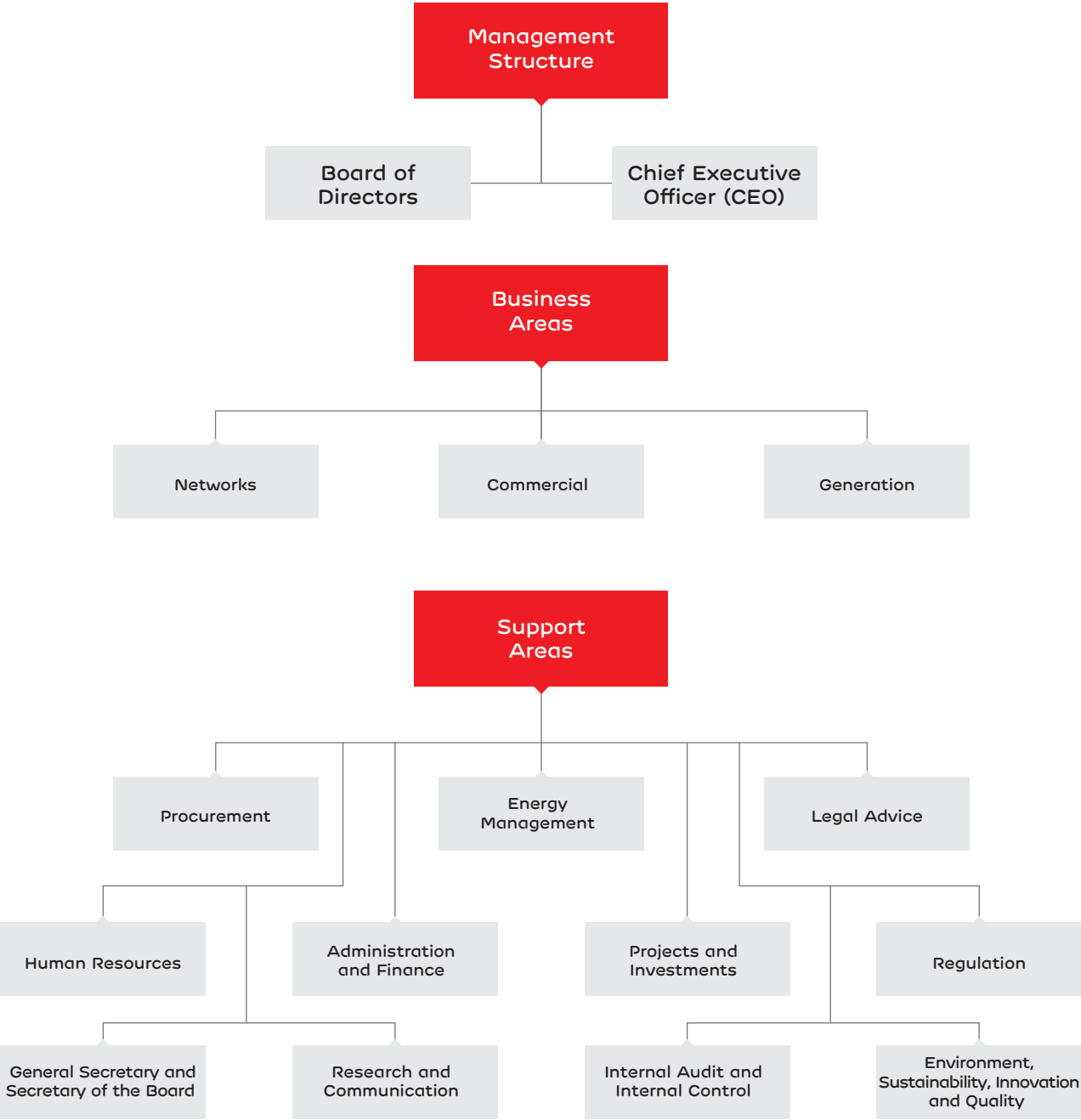
# Organizational Structure

HC ENERGÍA is composed of the following companies:



# Management Structure

HC ENERGÍA Group carries out both regulated (Electric Transmission and Distribution) and non-regulated activities (Production and Commercialisation of electricity). For these purposes, it has three independent business areas that receive multidisciplinary support from their staff.



# Strategy

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<b>35</b>	<b>Current Challenges and Opportunities</b>
<b>38</b>	<b>Stages of the Strategy</b>



Our company's **vision** demonstrates what we want to achieve. Our **values** reflect our shareholders' principles and beliefs, and help us develop a group identity.



• Joaquín Vaquero Palacios.  
Structure and design of the main entrance.  
ABOÑO'S THERMAL POWER PLANT.

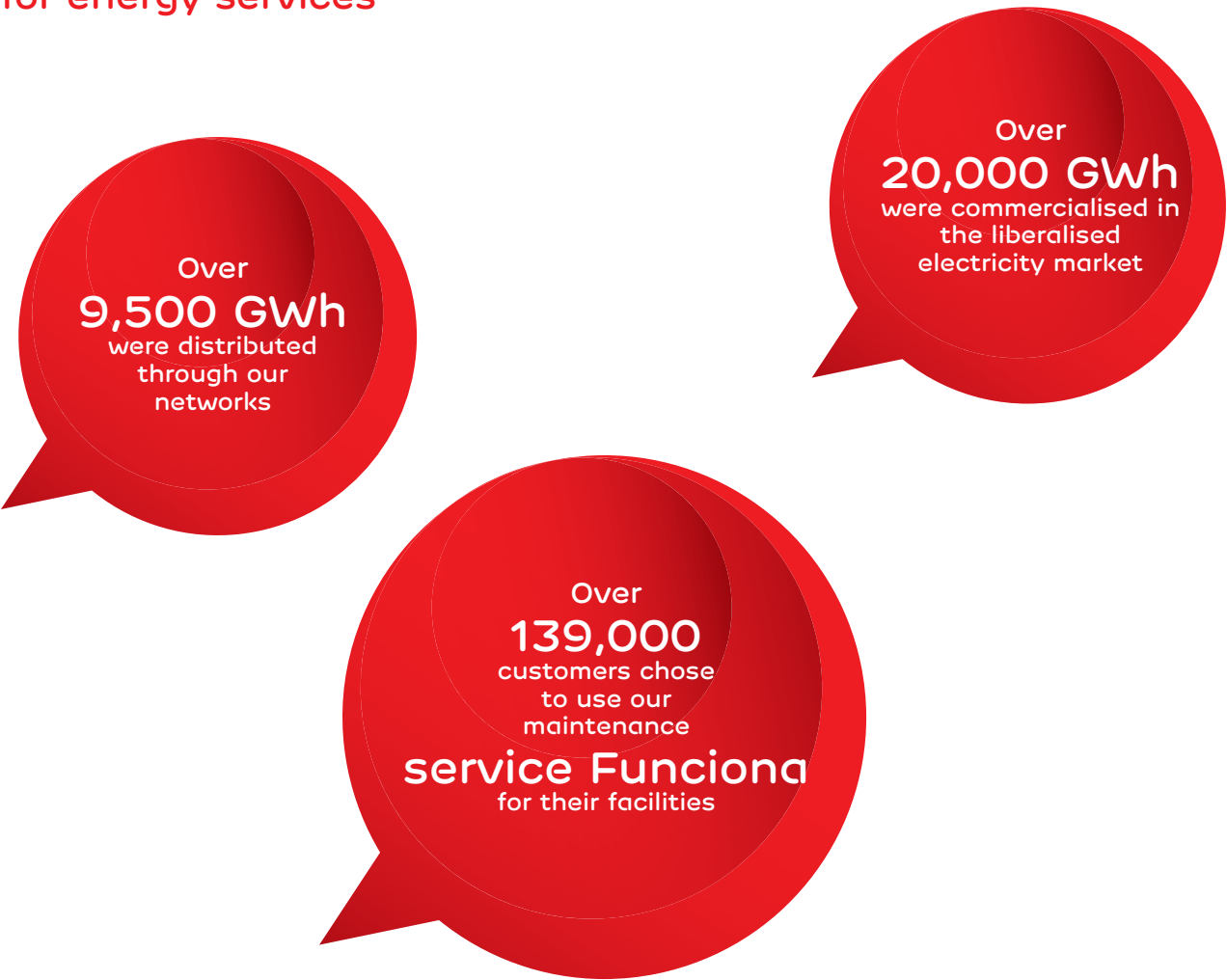
Vision

To become a global energy company and a leader in creating value, innovation and sustainability.

A company's vision projects what it wants to achieve. HC ENERGÍA has very clearly established ambitions.

2011 has meant a step forward in achieving these objectives:

Developing a global offer for energy services



## Creating value

- **Over 1.3 million electricity supply points.** This means that we are reaching more than 3.5 million people.
- **Over 200 million Euros in net profits**, which increases EDP shareholder dividends.
- **Increasingly clean electrical generation.**
- **Total staff members: 1,250 at the end of the year.** Employees report increasing levels of satisfaction with the company.
- **Nearly 12,000 school children participated in the “Viva Nuestra Energía” (Long Live our Energy) programme**, which aims to familiarise children with different energy sources whilst simultaneously promoting a sustainable use of them.

## Innovating

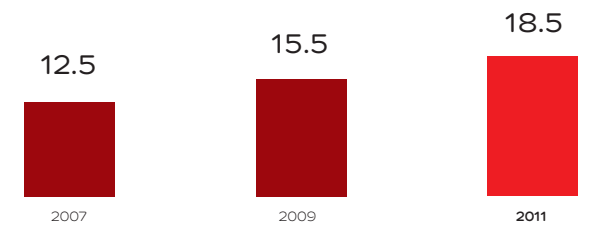
Through four strategic priorities, the development of electric vehicles being one of the most significant initiatives:

- **Fully flexible** and widely available generation.
- **Power efficiency** and microgeneration.
- **Networks** and power storage.
- **Electric vehicles.**

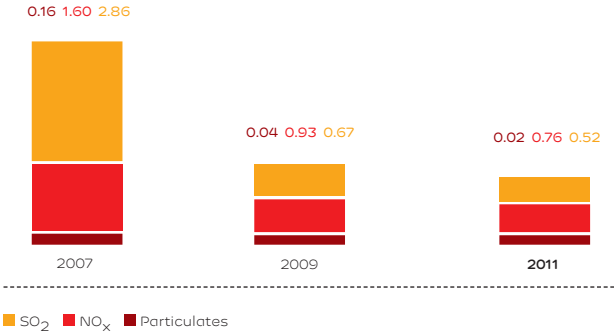
## Working in a sustainably way:

- **Participating in several projects** and activities described on our website [www.sostenibilidad.hcenergia.com](http://www.sostenibilidad.hcenergia.com)

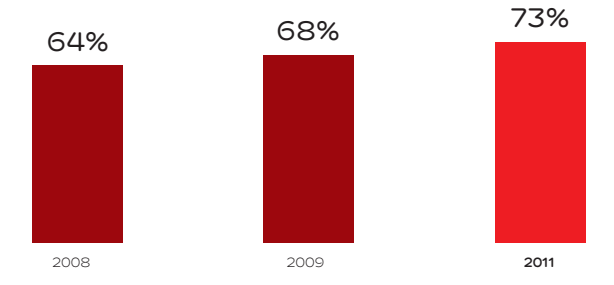
2007-2011 DIVIDEND EVOLUTION  
(Euro cents/share)



EVOLUTION OF SO<sub>2</sub>, NO<sub>x</sub> AND PARTICULATES EMISSIONS.  
2007, 2009 AND 2011  
(kg/MWh)



EVOLUTION OF SATISFACTION WITH HC ENERGÍA



Values

Our values reflect our shareholders' principles and beliefs, and help us develop a group identity



For the third year running, HC ENERGÍA has been rated spanish consumers' favourite company for electrical supply.



HC ENERGÍA's 200,000 customers make it possible to cut down CO2 emissions by 8 tons, thanks to e-invoicing.



HC ENERGÍA is included in the Reputation Institute's Top 100 most reputable companies in Spain.



LEAN methodology (continuously striving to improve our activities thanks to the participation of all our collaborators) is fully integrated into the Group's identity. Nearly 2,000 initiatives have been reported, with more than 400 participants.



In October 2011, HC ENERGÍA organised the convention "Con ciencia en la energía" (play on words in Spanish that could be reproduced in English as "Conscientious about Energy"), a symposium about R&D challenges in the electricity sector.

# Current Challenges and Opportunities

## International context

The current international context of the electricity sector affirms the sector's enormous potential:

- **World demand continues to grow** thanks to economic development and better standards of living in the countries that until now were considered "peripheral".
- **Substantial investments are required** in order to respond to this growing demand and to remodel existing power plants, which are subject to fossil fuels price fluctuations, climate change pressure and increasingly demanding environmental regulations (SO<sub>2</sub> and NO<sub>x</sub> emissions cause acid rain).

Furthermore, the international trend to adapt to this context reveals that HC ENERGÍA's strategy, as part of EDP Group, has proven to be appropriate:

- **Renewable energies** will progressively replace traditional sources of energy.

Gas power plants provide a satisfactory complement to renewable energy sources:

- **Regulated assets** for gas and electricity distribution are becoming increasingly scarce and appreciated with substantial demand from Investment Funds.

## Iberian context

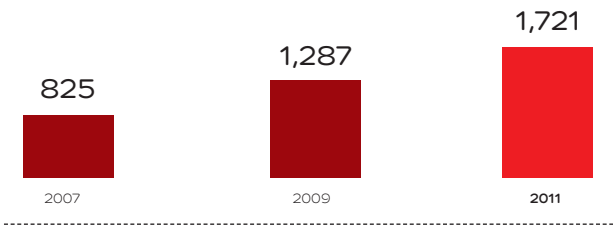
If international circumstances are relatively favourable, why are Iberian conditions so adverse?

Mainly for three reasons: one of them is related to current circumstances and the other two are structural causes.

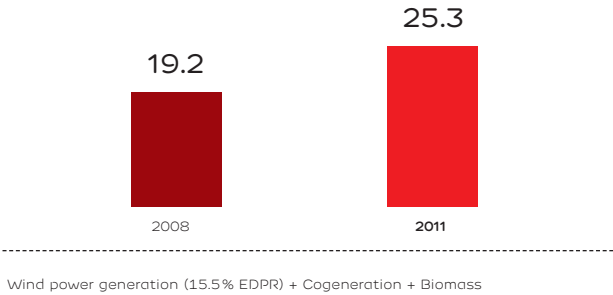
### Current circumstances:

- **An existing surplus of gas** in the market has caused retail prices to be below cost. This situation may improve as global demand increases.

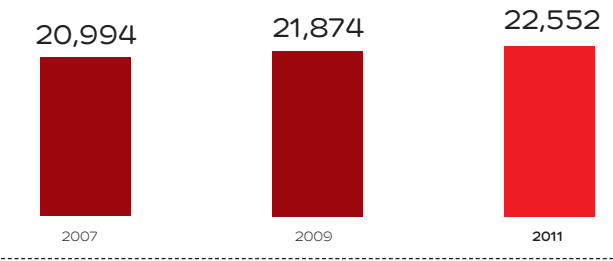
EVOLUTION IN GROSS MW OF HC ENERGÍA COMBINED-CYCLE CAPACITY



EVOLUTION IN % OF HC ENERGÍA'S GROSS INSTALLED CAPACITY OF RENEWABLE ENERGY



EVOLUTION IN KM OF HC ENERGÍA'S DISTRIBUTION NETWORK



### Structural reasons:

- **An existing surplus of installed capacity**, so that the regulator does not need to pay for "unused" installed power, even though it contributes to support the national electric power transmission network (thermal power plants).
- **The financial crisis** makes it difficult for the regulator to duly pay economic agents, through charging customers additional costs. This economic situation complicates financing, preventing Spanish companies from diversifying and expanding their portfolio, making investments in the most favourable markets.



Despite HC ENERGÍA's positive results in 2011, in the medium term, unfavourable conditions in Iberia are set to last, creating new challenges for electricity companies, particularly for those operating in the thermal business, where opportunities for growth will need to be created.

## Challenges

### An uncertain regulatory framework in the electricity sector

- A lack of reward for traditional thermal power plants for their critical support to the national electric power transmission network (they guarantee power distribution when renewable energies –the sun, water and wind– are not available). This poses a risk to these types of facilities of closing-down.
- Environmental requirements for thermal power plants are becoming increasingly stringent: they require significant investments, and recovery is not guaranteed due to minimal operation of the plants.
- There is a risk that new taxes might be implemented (regional taxes, windfall profits, etc.).\*

### Unpredictable profit from coal power plants

- This is due to existing unpredictable variables, such as CO<sub>2</sub> prices, national coal subsidies and the iron and steel industry situation –which determines the transmission of waste gases to Aboño's thermal power plant, where they are burnt together with the coal.

### Fierce competition for commercialisation

- Strengthening the pricing policy in commercialisation is essential, whilst rigorously managing risks, as we cannot be kept out of the market.

### Deficit in combined cycles

- The rise in the use of renewable energies and the surplus of installed capacity, have resulted in a reduction of combined cycle operations to 2,000/3,000 h/year, making investment recovery very difficult.

\* Windfall profits are supernormal and significant gains over a long period of time that occur as a result of extraordinary, unexpected circumstances which are not controlled by the company, or due to substantial changes in the legislation regulating the activities the company carries out. They are sometimes used to justify the regulator's intervention in the market to reduce the supernormal profits obtained by a company.



# Opportunities

## Regulated earnings optimisation

- Extending the installed capacity guarantee (or the use of equivalent mechanisms to remunerate power plant availability) to allow for the recognition of the critical role played by thermal power plants in the national electric power transmission network.
- Establishing a remuneration for electrical distribution, so that not only new investments are paid for, but returns are also generated for existing facilities.
- Completing the process of securitising the tariff deficit.\*

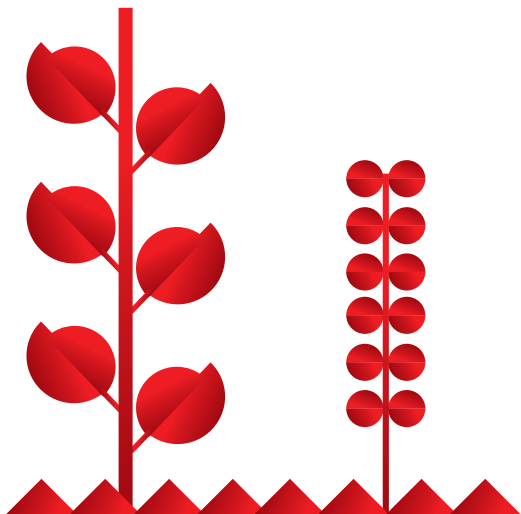
## Energy management optimisation

- Benefitting from the great flexibility and availability of our power plants (in 2011, 70 start-ups in coal facilities and 306 in combined cycles).
- Jointly managed gas and electricity, diverting available gas to combined-cycle power plants or selling it to customers, depending on the market conditions.

## Maximisation of commercialisation profits

- Optimising customer portfolios and prioritising dual customers (gas + electricity) and the added value services supply.

\* Tariff deficit occurs when returns arising from tariffs regulated by the Administration and paid for by customers for distribution services are not sufficient to cover the real costs of the service. Spanish legislation states that this deficit shall be temporarily financed by five traditional utilities: Endesa, Iberdrola, Gas Natural-Fenosa, HC ENERGIA –contributing 6%– and EOn.



## Stages of the Strategy

In 2005, HC ENERGÍA developed a long-term strategy resting on three main principles: orientated growth, maximum efficiency and controlled risk. This Strategy had three clear stages.

### Stage I (2006-2008)

Implementation of new growth opportunities through heavy investments in both generation and electrical distribution:

**Generation:**

- Building new electrical plants, based on the Best Available Technologies (Combined-Cycle and Electricity Cogeneration Power Plants). Three new plants were added to the existing Castejón 1 cycle from 2005 to 2010: Castejón 3, Soto 4 and Soto 5, and an electricity cogeneration plant (Tudela de Veguín Cogeneration Plant).
- Adapting existing coal power plants through investments aimed at reducing the emissions of pollutant gases to meet the requirements of environmental regulations, which are increasingly stringent.

**Distribution:**

- Consolidating our network expansion outside of Asturias, developing new plants and taking over some small distribution operators, which explains our current representation in Barcelona, the Community of Valencia, Huesca, Madrid and Zaragoza.

### Stage II (2009-2012)

Operation and optimisation of these investments; 2011 figures provide evidence of this (EBITDA of 676 million Euros, 20% higher than that of 2010 and mirroring levels recorded in 2009). **The most significant goals and the guidelines scheduled for 2012, according to Strategy principles are explained in Challenges 2009/2012 (pages 40-41).**

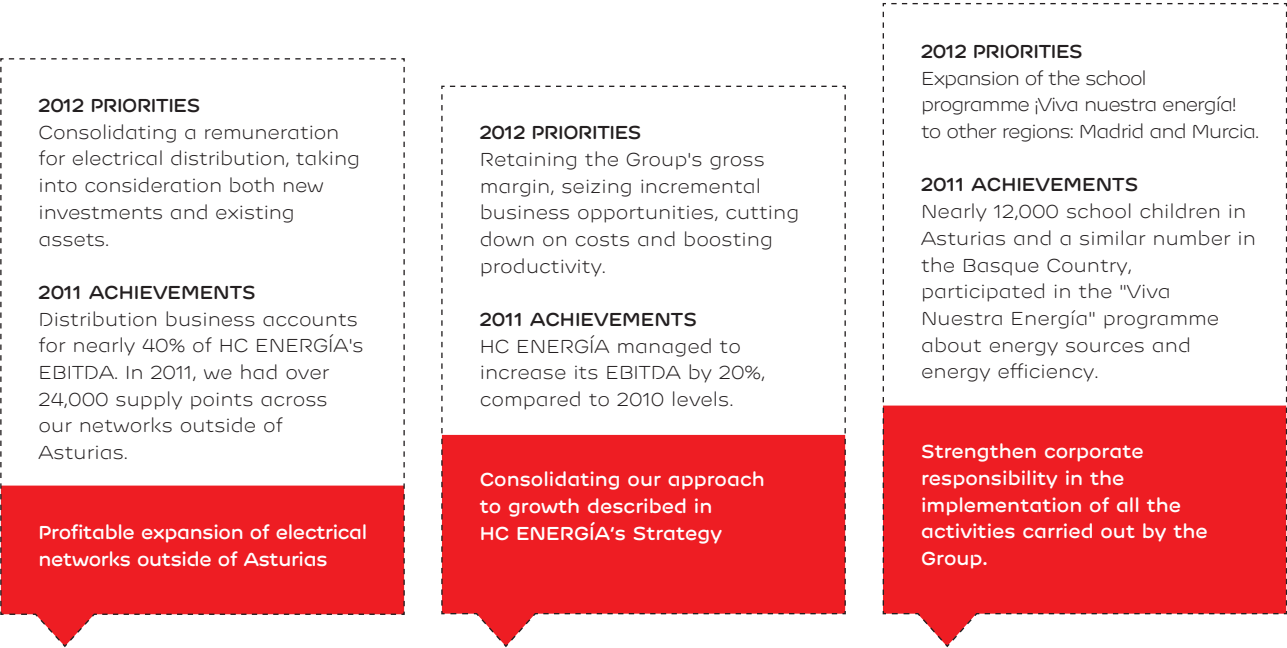
### Stage III (2013-2017)

The objective is to maximise shareholder profitability within an increasingly difficult and demanding financial context. This is why HC ENERGÍA's medium-term Business Plan is revised every year. The following forecast is in force for 2012-2015:

ELECTRICITY BUSINESS PLAN (million Euros)	2012	2013	2014	2015
Gross margin	639	632	651	648
EBITDA	381	383	372	363
Net investment	96	100	85	113

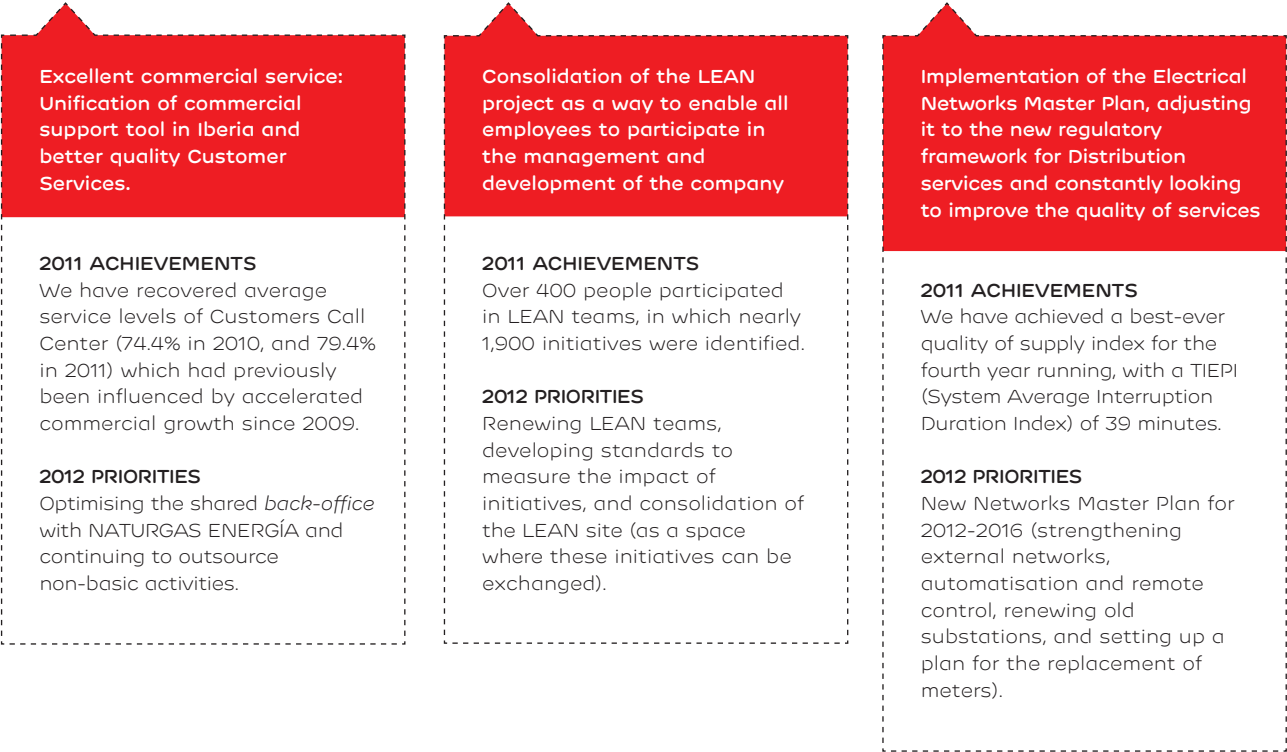


## Challenges 2009/2012



## Orientated growth

## Maximum efficiency



**2012 PRIORITIES**

Keeping the environmental variable in all areas, which involves renewing environmental management system certifications for generation (97% of the installed capacity) and distribution areas (100%).

**2011 ACHIEVEMENTS**

UNE-EN-ISO 14001  
Environmental Certification was obtained for Electrical Distribution. 97% of generating capacity is also certified.

Keeping environmental awareness at the core of HC ENERGÍA's business model

**2012 PRIORITIES**

OHSAS 18001:2007  
Occupational Health and Safety Management System certification, for Networks O&M and Hydraulic Power Plants.

**2011 ACHIEVEMENTS**

OHSAS 18001:2007  
Occupational Health and Safety Management System certification was obtained by Soto 4 and Soto 5 combined-cycle plants.

Improving Health and Safety as part of HC ENERGÍA's business model

Controlled risk

An increase in staff flexibility and mobility

**2011 ACHIEVEMENTS**

We have outsourced commercial activities for homes and businesses once integration has been achieved at a national level.

**2012 PRIORITIES**

Updating the collective bargaining agreement, highlighting the staff functional mobility policy to adapt to the new economic context and the changeable nature of the business.

Actions aimed at improving the staff satisfaction index

**2011 ACHIEVEMENTS**

HC ENERGÍA's global staff satisfaction index (76.6%), with 70% participation of the staff members in the survey.

**2012 PRIORITIES**

Developing and taking actions to improve weaknesses (promotion, communication, leadership) to allow us to achieve a global level of satisfaction of 80% in 2013.

An increase in generating capacity and Iberian dual offer

**2011 ACHIEVEMENTS**

Over 18,000 GWh sold in B2B –which resulted in an efficient hedging policy for generation– and over 3,000 GWh sold to B2C, with a dual customer-orientated strategy (gas + electricity).

**2012 PRIORITIES**

Maximising portfolio profitability: Strengthening pricing policies, increasing the dual contracts, and rigorously managing credit risk.

# Customers

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46	Communication channels
48	Quality of service
50	Domestic customer invoicing
52	Electricity Guarantee of origin and labelling



In 2011, for the third year running, HC ENERGÍA was rated Spanish consumers' favourite company for electrical supply.



\* Joaquín Vaquero Palacios.  
*Busbars on windows on main entrance.*  
COMPANY HEADQUARTERS AT PLAZA DE LA GESTA, OVIEDO.

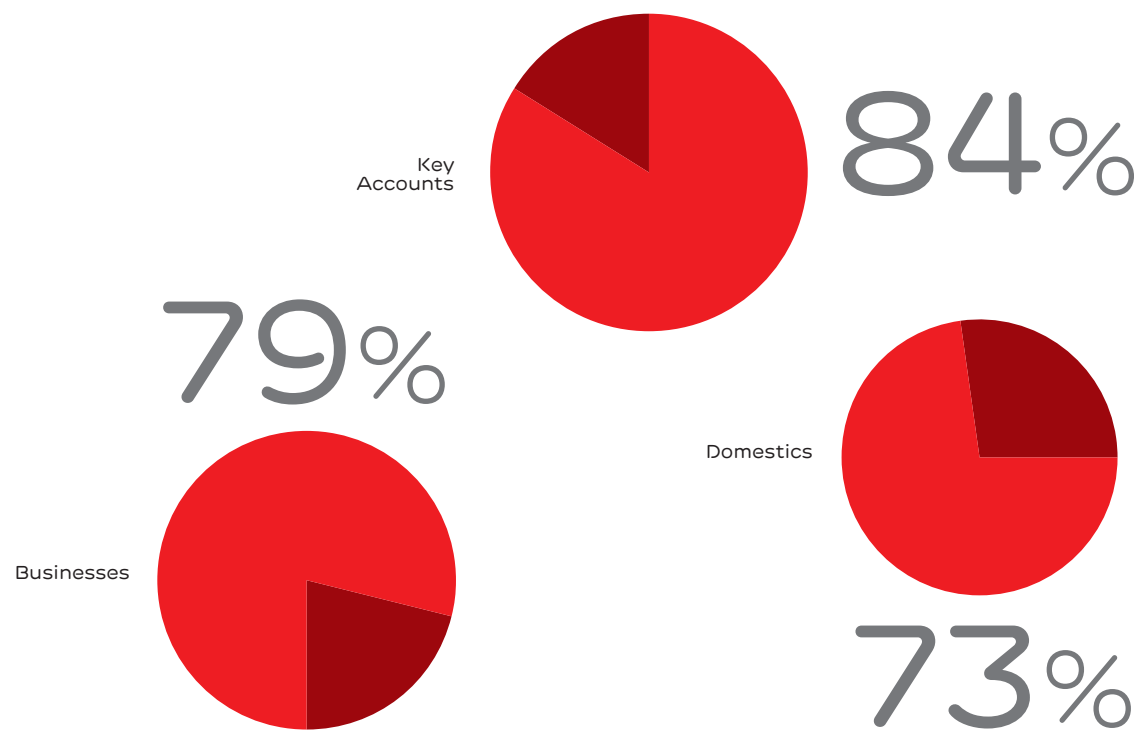


## Introduction

HC ENERGÍA has over 1,370,000 electrical supply points. Of them, more than 650,000 are connected to our supply grid (which distributes over 9,500 GWh), and the remaining customers use any of the Group's services suppliers (HC ENERGÍA, NATURGAS ENERGIA or CHC ENERGÍA), which manage over 20,500 GWh in the energy market. This commercialised energy is responsible for a market share of 12% in the liberalised market, hence, comfortably exceeding the natural market share.

It is also worth mentioning the Group's added value services for customers. Over 139,000 customers have chosen to use our maintenance service "Funciona" (this figure increases to 305,000 if NATURGAS ENERGIA's contracts are included) and 123,000 customers have benefitted from our e-invoicing service (210,000 if we include NATURGAS ENERGIA). In 2011, for the third year running, HC ENERGÍA was rated Spanish consumers' favourite company for electrical supply. This recognition is also endorsed by results achieved in annual customer satisfaction surveys used to gather customer opinions regarding our services.

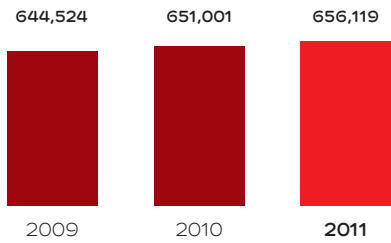
2011 PERCENTAGE SATISFIED / VERY SATISFIED CUSTOMERS



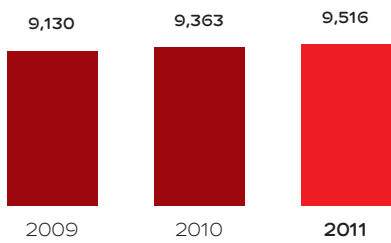
■ Satisfied/Very satisfied ■ Others

ELECTRICAL DISTRIBUTION

SUPPLY POINTS	
2011	656,119
2010	651,001
2009	644,524

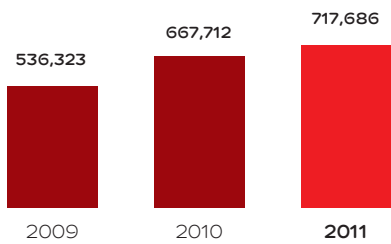


SUPPLIED ENERGY (GWh)	
2011	9,516
2010	9,363
2009	9,130

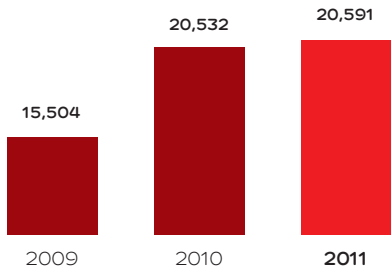


COMMERCIALISATION OF ELECTRICITY

SUPPLY POINTS	
2011	717,686
2010	667,712
2009	536,323



COMMERCIALISED ENERGY (GWh)	
2011	20,591
2010	20,532
2009	15,504



OVERALL DISTRIBUTION AND COMMERCIALISATION	2011	2010	2009
Overall electrical supply points	1,373,805	1,318,713	1,180,847
Overall supplied energy (GWh)	9,516	9,363	9,130
Overall commercialised energy (GWh)	20,591	20,532	15,504

## Communication channels

HC ENERGÍA has developed different communication channels to suit our many varied customers in order to maximise efficiency and to enable us to respond more effectively to their requirements.

### Commercial Offices

Our Commercial Offices in Asturias (Oviedo, Gijón and Avilés), offer face to face assistance to our B2C customers (domestic and small businesses), who can visit our office to deal with pre-contractual Issues, payments and claims, set or change new contracts and services. Moreover, since 2009 our offices are home to touch-screen kiosks, which allow customers to access the HC loyalty programme, settle and print invoices, and register complaints (HC ENERGÍA area).

In the light of the success brought by these machines, in 2010 another kiosk was installed at Los Fresnos Shopping Centre in Gijón.

Over **172,000 visits** and more than **49,000 operations** performed in kiosks



Oviedo's office.

### Regional Offices

Our Regional Offices all over Spain provide support to our B2B customers (B2B: key accounts and businesses, customers with an annual consumption of over 200 MWh).



**76 agents**  
in regional offices

### Customer Service Centre

Which operates 24 hours a day, 7 days a week, and has two separate lines –one for key accounts and business customers and another one for domestic and small business customers. Assistance is offered in Spanish, Catalan and Basque, to overcome language barriers.

Over **100,000 phone calls** are received on average every month

línea  hc energía **900 907 000**  
[www.hcenergia.com](http://www.hcenergia.com)

línea  hc energía **empresas**  
**900 907 005**



## Website

### HC ENERGÍA

[www.hcenergia.com](http://www.hcenergia.com), features personalised access through its private customer area. The website complies with accessibility regulations, as it ensures access to information for all, whatever their disability, and renders it correctly on any device.



### Sustainability

In 2010, a new website was created to specifically deal with HC ENERGÍA issues related to sustainability: [www.sostenibilidad.hcenergia.com](http://www.sostenibilidad.hcenergia.com), where any issues regarding the environment (water, waste, climate change and nature) are published, together with information on developed innovation projects (Fully Flexible and Widely Available Generation, Energy Efficiency and Microgeneration, Networks and Power Storage and Electrical Vehicles).

## FIDMA

HC ENERGÍA joins the Asturian International Trade Exhibition (FIDMA) every year. The motto used in 2011 was “La Ruta de la Energía” (The Energy Route). Participants were offered the chance to receive further information about energy saving and efficiency, take a test drive in an electric car, and get to know the CAR-e recharging solution.

Over **100,000 visits**  
to the pavilion

Entertainment was organised in the kids’ area with Viva Nuestra Energía’s main characters. Viva Nuestra Energía (Long Live our Energy) is the programme which has been developed by HC ENERGÍA since 2010 in schools all over Asturias to teach children the different sources of renewable energy, and to raise awareness about the benefits of the efficient and safe use of electricity.

**6,500 children**  
participated in the workshops

## Quality of service

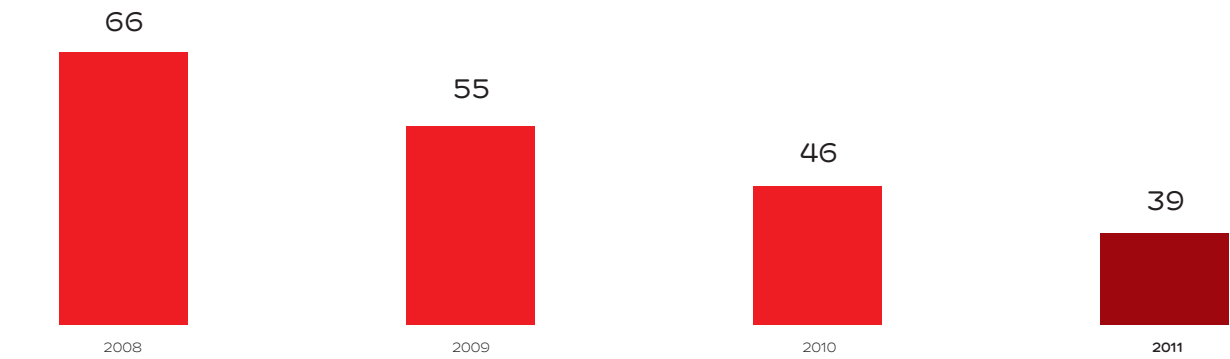
The quality of the electrical distribution can be measured using two parameters: Service continuity (interruptions and its duration) and the quality of customer care and services. There are legally binding target values for these indicators. Should utilities not achieve them, they are obliged to compensate customers.

## Continuity

**Continuity can be measured through the TIEPI indicator** (System Average Interruption Duration Index). In 2011, HC ENERGÍA achieved its best-ever index of quality supply for the fourth year running, with a TIEPI of 39 minutes (0.65 hours). However, 9,000 supply points reported values exceeding the legal threshold as a result of the duration or quantity of interruptions.

The TIEPI evolution reflects investment efforts injected to improve distribution facilities. In 2011, investments increased to nearly 95 million euros. The most significant were made in the construction of new substations (Gijón Harbour and Romio in Asturias, and Rojales in Alicante), the performing works on other existing substations, and the remote control system installed on over 100 transformation centers. All these works will allow us to respond to new demand whilst simultaneously improving the supply quality of the existing one.

(2008-2011) TOTAL HCDE TIEPI



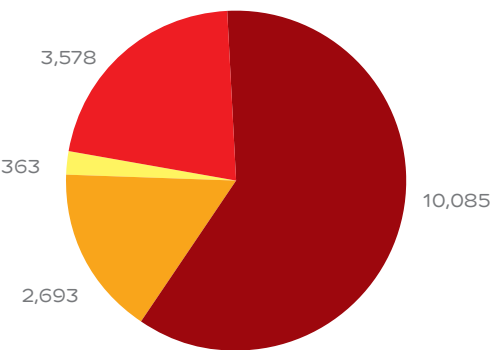
Interruption duration in minutes

## Customer Service Quality

**Customer Service Quality** is measured by the time spent by the utility performing operations such as connection to the supply grid and equipment installation, reconnecting supply service following a cut-off due to a non payment, submitting budgets and carrying out electrical installations. In 2011, HC ENERGÍA registered 452 instances of non-compliance to connection and non payments reconnections. The compensation fee for each of them is €30, or 10% of the first full invoice (whichever amount is higher).

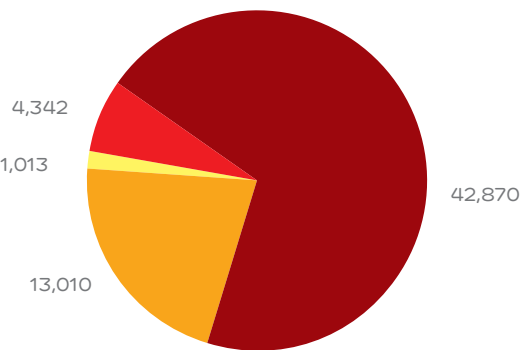
Complaints received by HC ENERGÍA regarding the quality of service are duly considered to decide upon the best way to resolve them and the actions to be taken in order to improve the quality of our services.

2010 HC ENERGÍA COMPLAINTS



Quality of supply Commercial cycle Added Value Services (AVS) Others

2011 HC ENERGÍA COMPLAINTS



Quality of supply Commercial cycle Added Value Services (AVS) Others

## Domestic customer invoicing

Up until 2009, domestic customer electricity invoices were issued every two months, based on the real use of electricity over the previous two months, as detailed in the physical meter readings.

### When was monthly invoicing introduced?

In September 2008, the Government asked utilities to replace bi-monthly utility invoices with monthly ones, so that both homes and businesses could acquire more information about their consumption, and, therefore, take action to reduce consumption.

### What problems arose from this kind of invoicing?

The change to monthly invoicing did not involve any alterations to meter reading regularity. Rather, legislation established that utilities issued an invoice with the estimated consumption (based on the previous year's consumption for that period) and subsequently, the following month, real meter readings were taken to correct any inaccuracies. In this system, none of the utility bills shows the real quantities consumed by customers, which results in an enormous number of complaints due to the extremely difficult regularisation process.

### What kind of domestic customers are facing these problems?

In 2009, the regulated electricity market vanished altogether, as well as its all-inclusive tariffs.

Customers were then allowed to search the free market for the provider with whom they could best negotiate conditions. Otherwise, customers were allocated a particular Last Resort Supplier (CUR, as per its acronym in Spanish) which would charge a Last Resort Tariff (TUR, as per its acronym in Spanish) that would be regularly revised by the Ministry of Industry, Energy and Consumption. Therefore, customers charged last resort tariff are the only affected by this monthly invoicing system.

### How do invoices reflect real and estimated meter readings?

Invoices detail the period for which settlement is required, indicating whether calculations are worked out based on real or estimated readings. In real meter readings, a table is included with the detailed consolidation, that is, the difference between the figures estimated in the previous month, and those obtained from the real meter readings in the current one, working out payable or refundable amounts depending on whether the discrepancies are positive or negative.

#### ESTIMATED INVOICE FOR MONTH 1

CONSUMPTION		10.08.2011 / 07.09.2011
		kWh
Previous reading	10.08.2011	1,520
Current reading**	07.09.2011	1,670
Estimated consumption		150
ELECTRICITY		
Consumption		
	+150kWh x 0.142319 € / kWh	21.35 €
Power		
	15kW x 0.056529 € / kW day x 28 days	2.37 €
Electricity tax		
	4.864% (23.72 € x 1.05113)	1.21 €
Equipment rental		0.53 €
Total amount payable for electricity		25.46 €
**Estimated readings according to Resolution from 14.05.2009		



REAL INVOICE FOR MONTH 2

150 kWh of consumption is charged in month 1. In the following month, month 2, real meter readings are carried out for the previous two months. These readings are included in the invoice of month 2.

From this real consumption, a daily consumption, which is the same for the whole period, is worked out in order to calculate the invoice for month 1 (once again) and that of month 2. In this case, we have information regarding the real consumption for 60 days, so that we can allocate 5 kWh to each day (300/60).

This means that 140 kWh (5 kWh/day multiplied by 28 days) should have been charged for month 1, instead of 150 kWh. This difference is detailed on the invoice for month 2, including both the consumption charges and the electricity taxes. The power item and the equipment rental do not require correction, as they are not dependant upon consumption.

CONSUMPTION 10.08.2011 / 09.10.2011	
	kwh
Previous reading 10.08.2011	1,520
Current reading 07.10.2011	1,820
Real consupction	300

	Estimated	Real	Difference
Consumption	150	140	-10
Settlement of items			kwh
Consumption	21.35 €	19.92 €	-1.42 €
E.T.	1.21 €	1.14 €	-0.07 €
Regularisation payment			-1.50 €

Additionally, this invoice includes the amounts payable for month 2, in this case, from 08/09/2011 to 07/10/2011. 5 kWh are allocated to each day, and the remaining items will be invoiced as usual:

ELECTRICITY	
Consumption	
+160kWh x 0.142319 € / kWh	22.77 €
Power	
15kW x 0.056529 € / kW day x 32 days	2.71 €
Electricity tax	
4.864% (25.48 € x 1.05113)	1.30 €
Equipment rental	0.53 €
Regularisation period	
10.08.2011 to 07.09.2011	-1.50 €
Total amount payable for electricity	25.82 €

# Electricity Guarantee of origin and labelling

## What is the Guarantee of Origin?

In 2008, the National Energy Commission, the regulator for energy systems in Spain, implemented **a new information system for electricity consumers regarding the origin of the electricity they are supplied**, which also aimed at promoting a green and efficient commercialisation of electricity: **The Electricity Guarantee of Origin and Labelling System**.

## How is a Guarantee of Origin issued?

Electric power plants owners, whose energy is generated from renewable sources (hydraulic, wind, solar, biomass, etc.) or through high-efficiency cogeneration, can request the National Energy Commission to issue a Guarantee of Origin for the electric power generated over a period of time. Upon reviewing the information provided in the application, the National Energy Commission will decide whether to issue this guarantee.

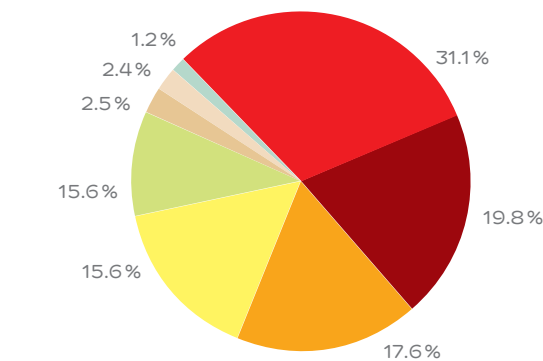
## What is the production mix?

Electrical power, regardless of its energy source, is transmitted through the national grid and supplies our homes with energy, making it impossible for the consumer to differentiate its source. However, from the overall energy transmitted in a year, we can deduce the proportion of it that has been originated from a coal thermal, gas combined-cycle, nuclear power and co-generation plants or in renewable energy facilities. This percentage mirrors the combination used by the overall national electricity system (**production mix**) to meet the country's annual electricity demand.

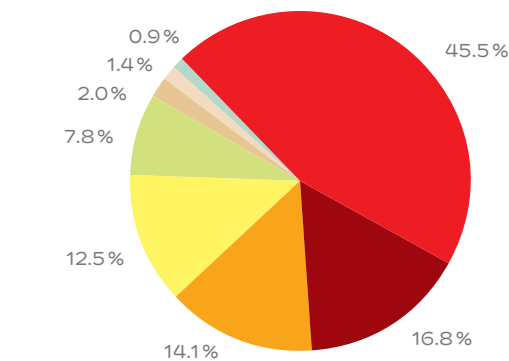
## How and why does an energy supplier obtain a Guarantee of Origin?

An energy supplier may wish to offer its customers cleaner electricity (through a higher annual proportion of renewable energy or high-efficiency cogeneration) compared to the national production mix; or even reach 100% of renewable energy. For these purposes, the energy supplier can obtain the Guarantee of Origin issued to electric power plants owners and, therefore, improve its commercial mix compared to the average national mix. This will allow the supplier to offer its users "green energy" and/or higher energy and environmental efficiency.

2011 SPANISH ELECTRIC SYSTEM'S PRODUCTION MIX



2011 HC ENERGÍA'S PRODUCTION MIX



■ Renewable ■ Nuclear ■ Natural Gas ■ Coal ■ Cogeneration ■ Fuel Gas ■ High Efficiency Cogeneration ■ Others

## How are Guarantees of Origin granted to final users?

The Guarantees of Origin obtained by the energy supplier can be utilised by specific users, so that they can prove to third parties that their annual consumption has been originated from renewable energy sources and/or high-efficiency cogeneration.

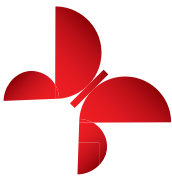
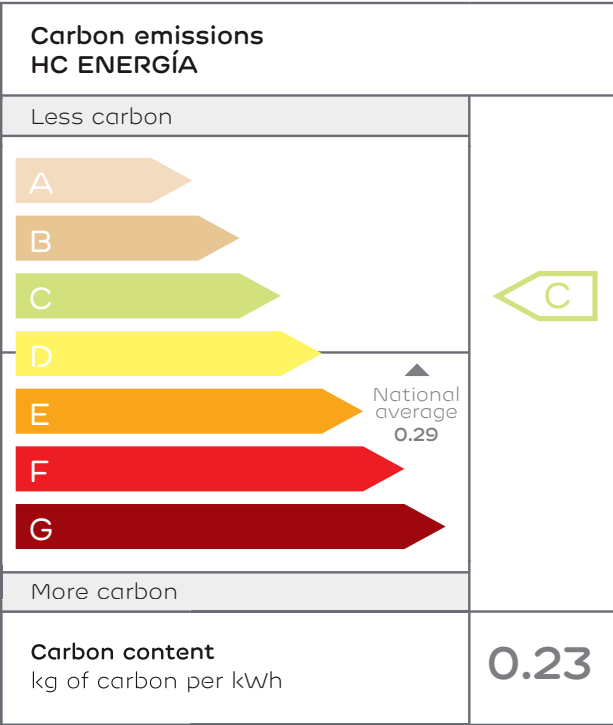
## What is the Electricity Label?

As a result of the Electricity Guarantee of Origin and Labelling System, every year the National Energy Commission publishes an electricity label on its website for each energy supplier, detailing the commercialisation mix, CO<sub>2</sub> emissions and radioactive waste production. The label refers to the energy that has been commercialised over the previous year. All electric power suppliers must include this information in invoices sent to consumers.

## Electricity Label for 2011 HC ENERGÍA's energy suppliers

As a result of its participation in this system, Hidroantábrico Energía S.A. obtained 4,440 GWh as Guarantees of Origin, and Naturgas Comercializadora S.A., 602 GWh.

Consequently, they have both achieved a class C for their energy, exceeding the national average, whilst a power supplier with no guarantees is rated as type E.



# Employees

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<b>64</b>	<b>LEAN</b>



HC ENERGÍA was awarded the Family-Friendly Company certificate in 2011.

This is the greatest recognition possible for the company's efforts in creating a new work identity that allows for efficient harmony between work, the family, and private life.



• Joaquín Vaquero Palacios.  
*Stained-glass and concrete windows at the main entrance.*  
COMPANY HEADQUARTERS AT PLAZA DE LA GESTA, OVIEDO.

## Introduction

HC ENERGÍA Group’s staff members amount to 1,250 people. Of them, 19% are women, which mirrors the gradual entry of women into the company.

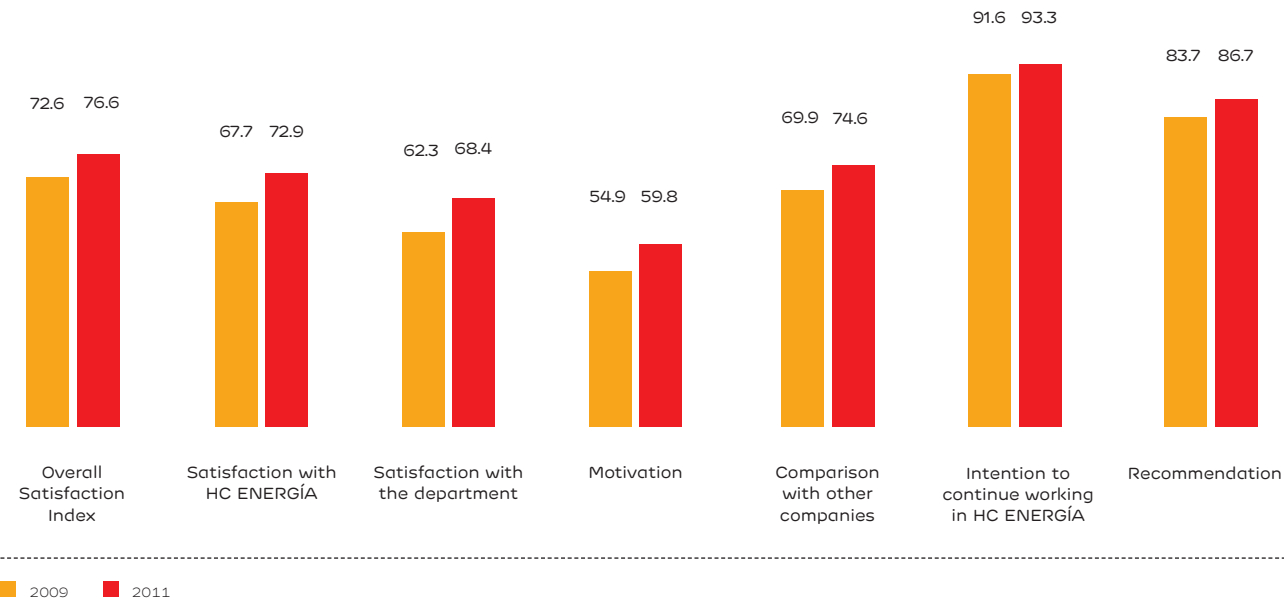
Additionally, the outsourced personnel was 1,659 providing services across the various Group companies, which reflects the economic impact of HC ENERGÍA on its context.

By sharing their expectations when participating in the biennial Work Environment Survey, and utilising the suggestion box on the company intranet, HC ENERGÍA employees perform a crucial role in managing the company’s work environment.

A new version of the Survey was conducted in 2011, with participation figures of 70.3%, which comfortably exceeds levels recorded in previous years (47.3% in 2009 and 31.5% in 2008), and confirms employees’ commitment to improve their work environment.

### WORK ENVIRONMENT SURVEY RESULTS

Average values (on a 0 to 100 scale)



# Employee Profile

## TOTAL STAFF MEMBERS

1,261	Men Women	83% 17%	1,251	Men Women	82% 18% ↑	1,250	Men Women	81% 19% ↑
2009			2010			2011		

## AVERAGE AGE OF STAFF MEMBERS

 45 years old	 44 years old	 45 years old
2009	2010	2011

## OUTSOURCED MEMBERS OF STAFF

1,170 Employees	1,458 Employees	1,659 Employees
2009	2010	2011

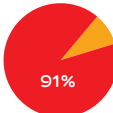
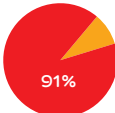


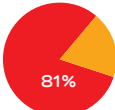

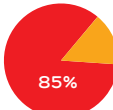
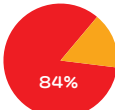
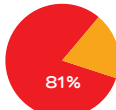
## BY AGE

< 30	<div><div>33%</div><div>67%</div></div>	79	<div><div>40%</div><div>60%</div></div>	67	<div><div>37%</div><div>63%</div></div>	54
30 39	<div><div>30%</div><div>70%</div></div>	375	<div><div>31%</div><div>69%</div></div>	366	<div><div>33%</div><div>67%</div></div>	363
40 49	<div><div>12%</div><div>88%</div></div>	394	<div><div>15%</div><div>85%</div></div>	371	<div><div>18%</div><div>82%</div></div>	377
≥ 50	<div><div>6%</div><div>94%</div></div>	413	<div><div>6%</div><div>94%</div></div>	447	<div><div>6%</div><div>94%</div></div>	456
2009		2010		2011		

Women

Men

## BY PROFESSIONAL CATEGORY

Top Management	 91% 9%	65	 91% 9%	64	 92% 8%	65
Middle Management	 82% 18%	935	 81% 19%	944	 81% 19%	939
Professionals	 85% 15%	261	 84% 16%	243	 81% 19%	246
2009		2010		2011		

Women

Men

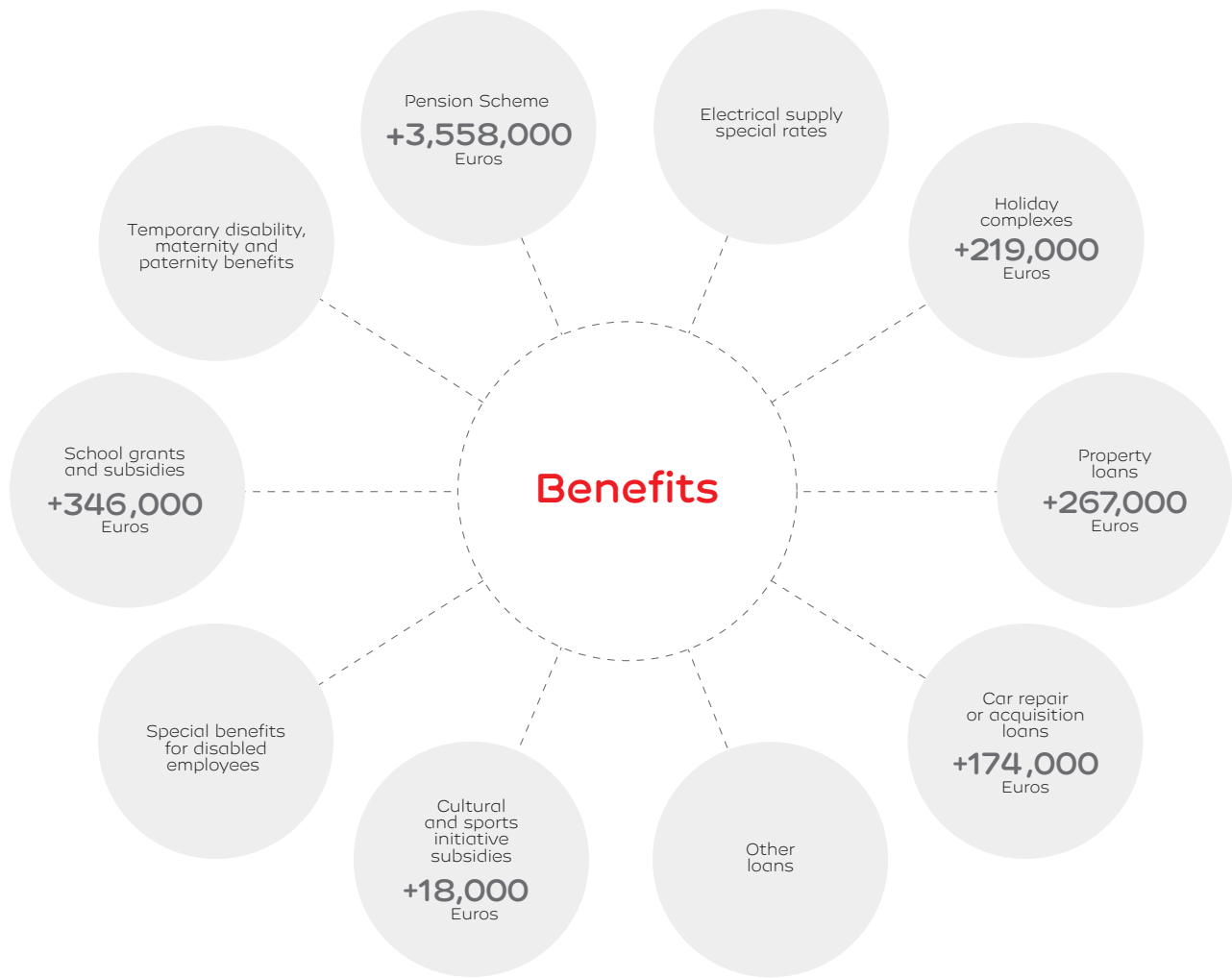
## Employment Framework

HC ENERGÍA'S first Collective Bargaining Agreement, signed in December 2007 for the period 2007-2012, is still applicable, with 98% of staff members adhered to it.

This Agreement meant reducing differences in employment and working conditions among the various Group companies following de-regulation in the electricity sector. The Agreement content is accessible via the online version on the company intranet.

Section VIII of the Collective Bargaining Agreement protects and regulates the employee's right to trade union representation, participation and industrial action. Additionally, a web section is available on the company intranet for the main unions to publish information and make it accessible to every intranet user.

A vast number of benefits are provided for in this Agreement, and they are divided into 10 categories:





# Gender Equality and Reconciliation Policies

The principles of gender equality and reconciliation are fully incorporated into HC ENERGÍA Group's policies and strategies.

Thus, Principle of Gender Equality and Non-Discrimination is reflected in its legal basis, through the inclusion of all legal provisions of Act 3/2007 on effective equality between men and women in the Collective Bargaining Agreement. Some aspects have even been improved.

Furthermore, some programmes and projects have been implemented, relating to health and wellbeing, education, private life and the community, which aim to enable reconciliation between the family and work. Access to all these initiatives is possible both through the company intranet and extranet.

## Health and Wellbeing

- **Employee offers** for wellness centres and physiotherapy clinics.

## Family and Education

- **Nursery school offers.**

## Work and Private Life

- **Offers for sports centres**, holiday and leisure products (hotels, car rentals), consumer products.

## Community

- **Offers on banking products.**

All these initiatives are accessible both through the company intranet and extranet, allowing for remote access and the online management of most operations.

In 2011, these initiatives resulted in HC ENERGÍA being awarded the **Family-friendly Company Certificate** by Fundación Másfamilia in co-operation with the Spanish Department for Health and Social Policies. This is the highest possible recognition for the company's efforts in creating a new work identity that leads to efficient harmony between work, the family, and private life.

Additionally, in 2011, **Equality Schemes** for the nine Group companies (drafted by the Joint Committee for Gender Equality, the regulatory body provided for in the Agreement and created in 2008) were published on the Spanish Official Gazette.

These schemes aim at strengthening the company's current gender equality policies in all aspects related to human resources management, consolidating equal opportunities for men and women, and correcting the traditional and social tendency to masculinise its personnel.

Along the same lines, and taking into consideration the results obtained in the Diagnosis of the Situation regarding gender equality carried out in the past, the Equality Schemes objectives are as follows:

- **To reaffirm the Company's Executive Management commitment** with effective equal opportunities between men and women, through direct involvement in the project.
- **To consolidate the cultural shift** towards gender equality, eliminating stereotypes.
- **To promote a balanced incorporation and representation** of women in every field within the company.
- **To take action and measures** with the guidance and supervision of HC ENERGÍA's Joint Committee for Gender Equality, as the Group believes that dialogue with employee representatives provides the solid and unquestionable cornerstones for the success of our business undertaking.

# Occupational Health and Safety

**“Occupational Health and Safety is an essential part of the company management and constitutes a duty and responsibility for all”**

This principle has guided the development of HC ENERGÍA's Integrated Occupational Health and Safety System, which rests on the following main pillars:

## Workplace hazards can be prevented

With the strong commitment from Top Management, efforts are being made to obtain an OHSAS 18001:2007 certification in the business units which require special attention, due to the nature of the work they do.

OHSAS international standard 18001:2007 allows companies to identify the hazards derived from their activities and determine the control measures required to prevent them. This is performed in a structured and certifiable way, with the aim of Constantly Improving the company's own system through better results in Workplace Health and Safety.

## Prevention is everyone's responsibility

**YOU are responsible for your own safety and the safety of others around you...**

With the intention of protecting this principle, the prevention organisation at HC ENERGÍA is supported by internal participation mechanisms, which have been approved by the Top Management to favour departmental interaction.

## Training and continuous development are essential

Employee training in occupational health and safety is a core part of HC ENERGÍA's Annual Training Scheme. In 2011, a total of 9,637 training hours in this field were recorded, with the participation of over 2,400 people.

Furthermore, occupational health and safety training needs for employees working in the Generation and Network business have been identified, and training courses have been scheduled according to the priorities of each position and the re-training needs identified.

### Castejón combined-cycle thermal power plant

The first to obtain the **OSHAS 18001** certificate in 2009.

### Soto de Ribera combined-cycle thermal power plant (Groups 4 and 5)

**OSHAS 18001** certification in 2011.

### Hydraulic Power plants

The process of implantation for **OSHAS 18001** has started with the intention of obtaining the certification.

### Aboño and Soto de Ribera thermal power plants

The process of implantation for **OSHAS 18001** has also started with the intention of obtaining the certification.

### Distribution O&M

Awaiting certification for 2012 (O&M Asturias).



Everyone must comply with the prevention regulations and instructions

A specific tool has been developed to assess compliance with Prevention regulations. This tool has been gradually integrated into all HC ENERGÍA Business Units.

Moreover, just as in Aboño Thermal Power Plant, a 24/7 Safety Programme (Critical Safety Behaviour) is being implemented in Soto de Ribera Thermal Power Plant.

Safety preventive observations shall be systematically carried out

A considerable increase has been achieved in the degree of compliance with the Safety Preventive Observations (OPS), which amounts to 107%, compared to targets set up for the various Business Areas.

Any deficiencies shall be assessed and rectified as soon as possible

Any accidents, incidents, and potentially harmful actions have to be analysed and rectified.

The number of accidents recorded in the HC ENERGÍA Group's personnel decreased by 40% in 2011.

Investing in prevention is cost-effective

A company that achieves a high degree of prevention is a well-organised, efficient, and quality company, that is, a profitable company with good prospects.

This explains why one of HC ENERGÍA's strategic priorities is to achieve the "zero accident" goal, and to integrate Prevention and Safety into HC ENERGÍA's business model.

	2011	2010	2009
OWN STAFF MEMBERS			
Accidents incurring leave	3	5	2
Accidents not incurring leave	6	5	6
Lost working days	141	183	459
Hours of work	2,097,473	2,193,157	2,151,800
Absenteeism (% of lost hours vs. hours of work)	3.4%	3.1%	3.5%
Hazard index (accidents Incurring leave / people exposed x 1,000)	2.42	3.97	1.57
Regularity index (accidents Incurring leave / hours of work x 1,000)	1.43	2.28	0.93
Severity Index (lost working days / hours of work x 1,000)	0.07	0.08	0.21

## Training and Continuing Professional Development

The commitments included in HC ENERGÍA's training policy are put into practice every year through the development and implementation of our **Training Scheme**.

This document contains the training needs which have been identified and approved by the company, and are the result of individual requests from employees, performance assessment conclusions, and managerial suggestions.


Furthermore, cross-cutting and corporate areas requests are also integrated (training in occupational health and safety, environment and quality), together with those received from Trade Unions (by virtue of the Group's collective bargaining agreement, there is a Joint Committee for Training that monitors the Scheme and helps develop the training policy of all the Group companies).

The **potential and performance assessment process** for collaborators is the Group's key tool for human resource management.

This process considers two different aspects:

- The **assessment of strategic skills** ("potential"), which focuses on both the present and the future, and looks at the collaborator's development.
- The **assessment of objectives** ("performance"), which focuses on the past and the present, and looks at results and the capacity to create value.

With the intention of developing the potential and professional capacities of employees, as well as the Annual Training Scheme, a specific programme targeting small groups has also been developed:

<div>Coaching</div> <p>This project, which was initiated in 2006, <b>is a process by which a collaborator (coachee) receives assistance to develop his/her professional capacities, with the support of a Manager (acting as a guide).</b></p> <p>This project was jointly developed by NATURGAS and HC ENERGÍA in 2011, which made it possible to exchange guides and coachees.</p> <p>With an average annual participation of 30 people, a new call for participants was opened in 2011, to develop new coaching projects in 2012.</p> 	<div>EDP University</div> <p><b>In 2009, EDP University was created –an initiative intended to share knowledge acquired by the Group over the years,</b> as a result of individual and collective working experiences and employees' intrinsic competencies.</p> <p>The university features:</p> <ul style="list-style-type: none"><li>• <b>Two cross-cutting schools:</b> EDP School, designed to develop general knowledge and skills, and the <b>School for Management Development</b> (development of managerial and leadership skills, as well as behavioural competencies).</li><li>• <b>Five functional schools to develop particular skills for each one of the company businesses:</b> Generation, Distribution, Gas, Renewable Energies, and Marketing.</li></ul>	<div>Postgraduate student support plan</div> <p>In 2011, the third "Postgraduate student support plan" was launched.</p> <p><b>The plan was conceived to support HC ENERGÍA graduate employees who wish to complete a PhD. Their doctoral thesis has to be part of an R&amp;D&amp;I project of the Group</b> which is in line with their innovation priorities, or with other HC ENERGÍA's innovative projects.</p> <p>Help is offered to employees in the following ways:</p> <ul style="list-style-type: none"><li>• <b>Remunerated leave</b> for a specific number of days.</li><li>• <b>Economic compensation</b> for registration fees.</li><li>• <b>Economic compensation</b> of up to 3,000 Euros for further training.</li></ul>
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# Employees Solidarity Initiatives

A number of solidarity actions have been developed in 2011, with the efforts and support of HC ENERGÍA employees:

## Company Volunteering Project

The Company Volunteering Project was created in 2011, as an EDP Group initiative, and aims to promote employee participation in volunteering activities.

The implementation of this project in HC ENERGÍA was made possible thanks to the creation of several working groups which participated in several initiatives:

- The **Energy Development Team**, with the participation of 20 people from different areas and profiles, united by a common objective: conducting studies and technical and economic projects which provide water and energy supply in several areas of underdeveloped countries and, subsequently, develop and implement them.  
  
Currently, the project that is being designed is for Togo (Africa), and it intends to facilitate supply to 1,100 people in the "Koka area".
- **The Food Team**, with the participation of 6 people and the support of the Food Bank, takes part in a number of activities regarding the management and collection of surplus food to distribute to several partner charities. The group also participates in Kilo operations, as well as in communication and awareness campaigns in schools. The number of charities which benefit from the distribution of the Food Bank is 130, reaching 15,120 people and distributing over 1,504 tons of food a year.
- **The Childhood team**, made up of several volunteers who work with children from various Child Shelters, controlled by the Principality of Asturias (Government of Asturias), and carry out school support and tutoring activities.

## 2011 Christmas Campaign

HC ENERGÍA's Christmas Campaign is in line with the EDP Group Volunteering Project, aimed at assisting the most vulnerable people at such a special time of the year.

Three initiatives have been undertaken:

- **Food Collection Campaign.**
- **Toy Collection Campaign.**
- **Celebration day with foster children from the San José Shelter.**

The collected food was donated to the Asturian Food Bank –a non-profit organisation aimed at distributing food to various charities in need, one of them being the Cocina Económica, amongst other shelters.

Toys were donated to Avilés Red Cross, where they were distributed to kids from families in need.

The celebration day with children from the San José shelter took place on the 15<sup>th</sup> of December with the participation of 50 children. One of the volunteers, an HC ENERGÍA's employee, took part in the event as a magician.

## End of the technical implementation of the solidarity day project

In 2010, HC ENERGÍA started the "Día Solidario" (Solidarity Day) Pilot Project, with the objective of developing a project to improve the prospects and standards of living of some of the world's most vulnerable people, through the participation and the support of both, employees and the company, the former could donate a day's work salary, whilst the latter, through HC ENERGÍA FOUNDATION, doubled the amount contributed by its employees.

The project was intended to supply water and electricity to a health care centre located in the little village of Bongowerou, in Benin, through installing a general electrification system with photovoltaic panels which enabled to reduce costs.

The results exceeded our expectations, since the amount contributed was higher than needed for the project. Therefore, the remaining funds were allocated to the acquisition of vaccines and drugs for the Bongowerou health care centre.

Thanks to the co-operation of HC ENERGÍA's employees and HC ENERGÍA's FOUNDATION hard work, the dreams of the Bongowerou health care centre in Benin became a reality.



LEAN

LEAN is a work methodology intended to continuously improve activities through the participation of all the Organization’s collaborators in identifying opportunities, designing solutions, and eliminating useless, inefficient or ineffective tasks.

Waiting times, unnecessary consumption (auxiliary equipment), inappropriate processing, unnecessary transporting (tools and materials being stored far from where they are utilised), over-processing, unnecessary activities (overlapping tasks), etc.

HC ENERGÍA also considers occupational health and safety, a cleaner environment and a favourable working atmosphere, to be priorities for the improvement of its performance.

**LEAN is one of the five multidisciplinary projects of the EDP Group’s EDP Way Office Programme, developed in the 2009-2012 strategic plan to promote the consolidation of business, the creation of value and the increase in implementation capacity.**

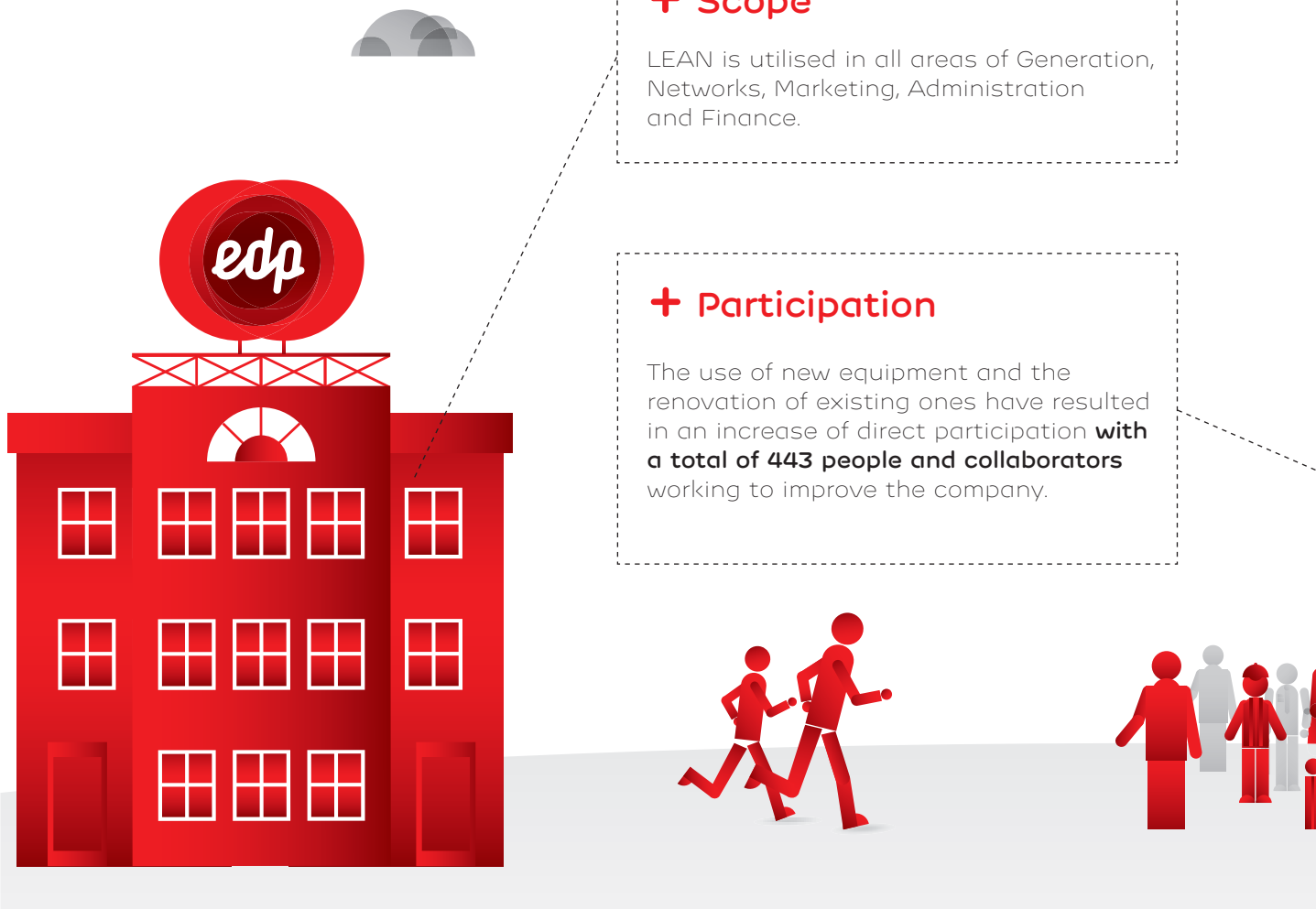
Five years have gone by since HC ENERGÍA first started putting the LEAN methodology into practice. It is worth mentioning some important facts regarding the systematisation and consolidation of LEAN into the Company’s identity:

+ Scope

LEAN is utilised in all areas of Generation, Networks, Marketing, Administration and Finance.

+ Participation

The use of new equipment and the renovation of existing ones have resulted in an increase of direct participation **with a total of 443 people and collaborators** working to improve the company.



## + Initiatives

396 new initiatives were identified, **1,892 since the programme started. Of them, 1,373 have already been completed**, and some of them have been implemented in various departments (synergies).

## + Communication

14 team presentations took place to share the initiatives with colleagues. Some of them were given in different places at the same time to promote the sharing of ideas. Ideas have also been gradually introduced in corporate media's articles and news. Constant support from Management is demonstrated by their participation in presentations, among other initiatives, as well as the rewards offered for outstanding initiatives.

**The LEAN site was created in 2011 to provide relevant information about initiatives from all Group EDP companies.**

Every employee can access the website at all times and remain informed of initiatives, presentations, reports, training courses, scheduled presentations, relevant initiatives, etc., both from their own unit, and from other EDP Group company units.



# Suppliers

68	Introduction
69	Communication channels
70	Internal quality assessment
71	Suppliers Health and Safety





HC ENERGÍA territorial distribution is strongly linked with the Principality of Asturias, which explains why this stakeholder is compiled of a considerable number of regional companies.

Our expansion into other areas has led to an increase in the number of suppliers and outsourced personnel.



\* Joaquín Vaquero Palacios.  
*Decorative wall painting showing the construction of electricity power lines at the headquarters.*  
ABOÑO'S THERMAL POWER PLANT.

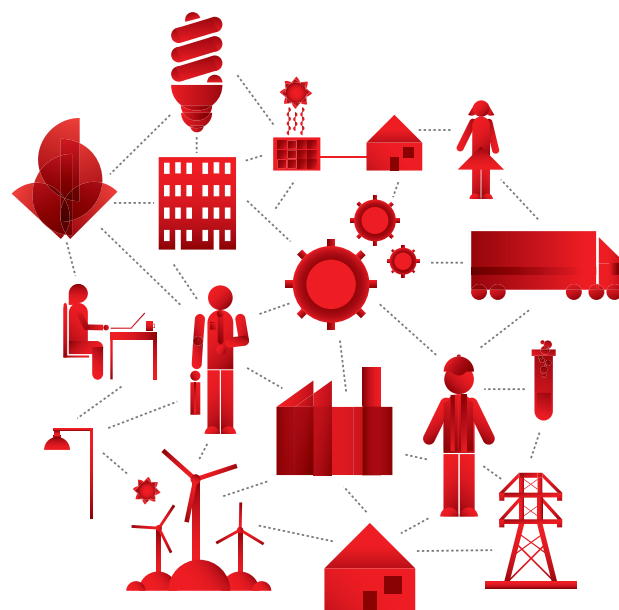
# Introduction

HC ENERGÍA collaborates with numerous Partner Companies, with whom it constitutes a sort of network structure, in which the Group companies operate as parent companies, developing **core businesses**, while the partner companies, as branches of that network, carry out support and auxiliary activities, enabling, amongst other things, the optimisation of resources.

This relationship has resulted in Contractors becoming stakeholders identified by HC ENERGÍA, thus forging communication and management ties between the company and its suppliers.

HC ENERGÍA territorial distribution shares strong connections with the Principality of Asturias, explaining the presence of numerous regional companies in the make-up of this stakeholder. Its expansion into other areas in Spain and the outsourcing requirements for some services, as a result of internal human resource optimisation and the coordination of activities within EDP Group, have led to a significant increase in the number of suppliers and outsourced personnel.

	2011
<b>SUPPLIERS DATA</b>	
<b>Volume of supply and services</b> (million Euros)	157.7
<b>Suppliers with sales revenues exceeding 60,000 Euros</b>	286
<b>Suppliers registered in Re-Pro</b> (as on 31.12.2011)	819
<b>Suppliers internally audited by HC ENERGÍA</b>	72
<b>External audits performed</b>	22
<b>Outsourced personnel</b>	1,659



# Communication channels

The REPRO database is utilised to manage documents, and to follow up and control the economic, social and environmental performance of suppliers.

This database provides detailed and updated information about the following areas:

- Technical Resources.
- Human Resources.
- Occupational Health and Safety.
- Quality Management.
- Environmental Management.
- Economical and Financial Situation.

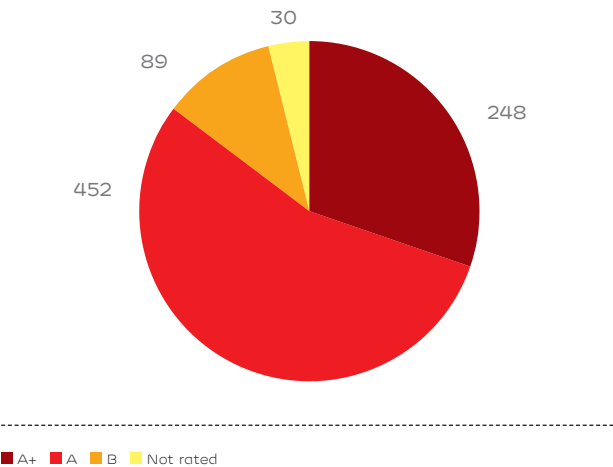
Suppliers considered critical –because of their impact on the quality of the final product– and registered with REPRO, are subject to external audits to verify that the documents provided are still valid. The results of this audit are stored in the REPRO database. In 2011, 22 companies were audited achieving positive results.

Since 2010, REPRO has included an optional ratings module to measure supplier sustainability –Scoring RSC– which provides relevant information regarding the company's Corporate Social Responsibility. This module analyses and audits the following aspects:

- **Leadership:** The commitment made by the company with regards to Corporate Social Responsibility (CSR) and corporate government.
- **Dialogue:** Willingness to negotiate with stakeholders.
- **Management systems:** Systematisation of CSR Management.
- **Communication and transparency:** Feedback from stakeholders.

The assessment of this data allows us to compare the sustainable performance of suppliers and rate them accordingly. An A+ rating is assigned to suppliers with an above average performance, an A is given for an average performance, and a B is allocated to suppliers whose performance is considered to be below average.

HC ENERGÍA SUPPLIERS RATED WITH THE SCORING RSC



Additionally, it is worth mentioning that symposiums and forums are held regularly, within the framework of existing communication lines between HC ENERGÍA and its Partner Companies. These meetings are designed to enable parties to exchange experiences, assess performed activities and review applicable legal requirements in order to identify opportunities for improvement and the optimisation of resources.

Along the same lines, it is also noteworthy to mention the Environment and Occupational Health and Safety Continuous Improvement Day, organised every six months by the Department of Networks. The majority of Contractor Companies within this business take part in this symposium, in which analyses are carried out measuring the main indicators of occupational hazards, as well as in other environmental aspects arising from activities performed. Moreover, good practices in prevention are identified.

In 2011, a similar symposium was held with the participation of Contractor Companies from the business of Hydraulic Power Plants. Emphasis was given to the need to co-operate on environmental issues, due to the location of the plants in Environmental Protected Areas.

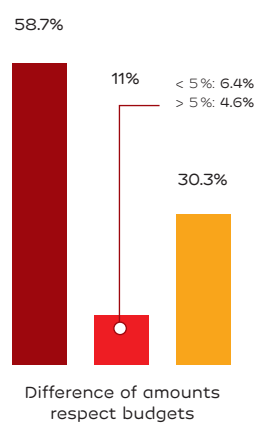
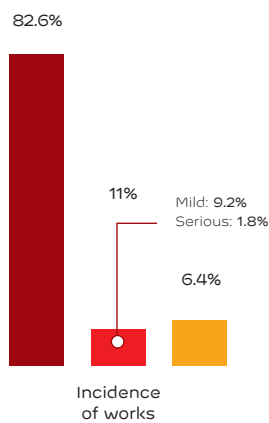
## Internal Quality Assessment

### Internal Surveys

An internal assessment of the Contractor Companies working for HC ENERGÍA is carried out as part of the Quality Management System. This assessment is compiled of surveys completed by project supervisors (from the Contractor Companies) and the Internal Department of Purchasing.

Regarding assessment surveys conducted in 2011, the quantitative data demonstrates the positive performance of our suppliers in every aspect of the work they do.

- 112 surveys received.
- 72 suppliers assessed.
- 994.4 % of suppliers obtained positive results, that is, a score equal to or higher than 2/3 of the best possible score –10.



■ No ■ Yes ■ Unknown



■ Very good ■ Good ■ Normal ■ Bad ■ Very bad ■ Not apply

## Risk analysis in the supply chain

In 2011, HC ENERGÍA took part in the EDP Group project: "Analysing the supply chain risks from a sustainable point of view".

A working group was set up in order to:

- **Establish the risk profile associated with the supply chain** and risks linked with the Group's commitment to sustainable development, mainly relating to human and work rights, environmental management, integrity, and ethics.
- **Classify the various risks according to their importance**, considering their potential impact or damage to the Company's reputation, and their repeatability or regularity.
- **Identify existing control/follow up initiatives** for risks in the value chain and assess their effectiveness.
- **Identify/study new opportunities for EDP to influence** its supply chain.

# Suppliers Health and Safety

Just as HC ENERGÍA works to improve Occupational Health and Safety amongst its employees, we also strive to improve the occupational health and safety of our contractors.

Subsequently, specific action plans have been designed in order to broaden the knowledge of employees, apply HC ENERGÍA's own work procedures and, in short, integrate HC ENERGÍA's prevention culture into the way our contractors operate.

As a result of the Benchmarking study regarding occupational health and safety conducted in 2008, and the improvement plan for 2009-2011 that stemmed from it, changes have been introduced into the contractor's management model, so as to consider the performance of companies in the area of prevention both in tender processes and in the supervision of ongoing projects.

Consequently, in 2011, the "Assessment of the Preventive Performance of Contractors" process was implemented in the Supplier Management Module of the PROSAFETY tool.

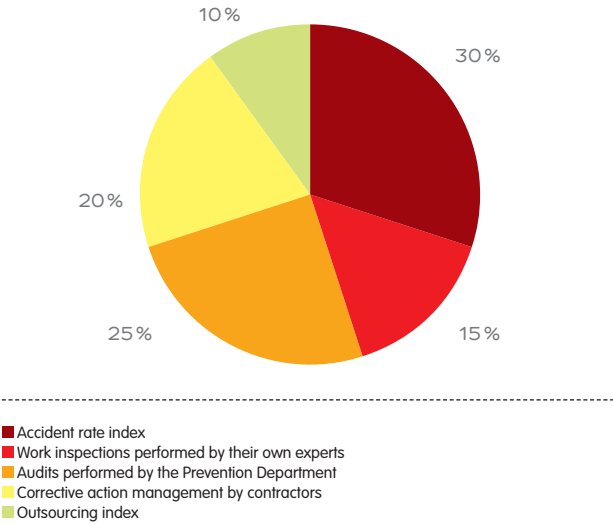
This process aimed to set down the necessary parameters to enable the Department of Prevention and Procurement to assess the preventive performance of any contractor, so that the scores achieved could be considered for future tenders.

This analysis can be performed thanks to the information stored in the Intranet supplier area. The score is obtained on the basis of the following aspects:

Given the 0 to 10 rating scale, according to the rating achieved by each contractor, the **Prosafety Module Supplier Management** designates a representative colour to indicate the preventive performance and the need to establish Action Plans in the event of deficiency.

$\geq 6.5$	No action required.
$\leq 6.5$ $\geq 5.0$	The second consecutive year in this category supposes to elaborate an actuation plan.
$\leq 5.0$ $\geq 2.5$	The company will elaborate an actuation plan. If it is not given in three months, the definitive suspension will be proposed.
$< 2.5$	The company will elaborate an actuation plan. If it is not given in a month, the definitive suspension will be proposed.

VARIED DEGREE OF IMPORTANCE ACCORDING TO THE CATEGORY:



# Society

74	Introduction
74	Solidarity Projects
75	Educational initiatives
76	“Viva Nuestra Energía” school programme
78	Green Activities
78	Cultural Initiatives
79	Sports Sponsorship



HC ENERGÍA FOUNDATION works together with the Department of Human Resources to channel different corporate volunteering initiatives into the work of numerous NGOs, involving the participation of 41 employees.



\* Joaquín Vaquero Palacios.  
*Stained-glass and concrete windows at the main entrance.*  
COMPANY HEADQUARTERS AT PLAZA DE LA GESTA, OVIEDO.

# Introduction

Training, environmental awareness, promoting culture and supporting sportive initiatives, are just some of HC ENERGÍA FOUNDATION hallmarks that have been present in its undertakings since it first began. All these projects and many more, fall within the wide range of sustainable development of the context where the company carries out its activity.

This report includes the main initiatives in which the Foundation has participated over the course of 2011.

## Solidarity Projects

### Solidarity

HC ENERGÍA FOUNDATION works alongside numerous associations and charities:

- **Cocina Económica (Affordable Food):** An institution run by the Sisters of Charity, which serves thousands of meals to homeless people.
- **Nuevo Futuro (New Future):** An association dedicated to providing and maintaining foster homes for homeless children who, for various reasons (orphan-hood, abandonment, lack of economic resources, etc.), do not enjoy the benefits of living in a family environment.
- **Cruz Roja (Red Cross):** An organisation operating nationally and internationally, that approaches vulnerable people through initiatives related to prevention, assistance, rehabilitation, and development. These activities are mainly performed by volunteers.
- **Energía sin Fronteras (Energy without Borders):** An independent organisation whose mission is to spread and enable the use of energy and drinking water in places where access is not available or where the service quality or supply conditions are very poor.

### Volunteering Programme

The “EDP Volunteering Programme”, implemented within the framework of the European Year of Volunteering, operates within all Group companies. This programme reflects the strategic objectives of the Group, where sustainability and thus social responsibility, represents one of its main principles.

Projects are developed through partnership agreements with NGOs, and company employees can sign up to volunteer. Registration with the Programme is accessible via the corporate Intranet, where the different NGOs and available projects are listed.

HC ENERGÍA FOUNDATION works with the Department of Human Resources to enable employees to volunteer in a variety of NGOs initiatives. So far, 41 employees have been involved in different projects.

### Responsible Points

“HC points” is a free programme rewarding HC ENERGÍA customers for their loyalty. Points can be accumulated in the following ways: 1 HC point is awarded for every kWh of gas or electricity consumed, for registering new contracts with us, for every year customers are adhered to the HC Points programme, for participating in HC ENERGÍA initiatives, etc. Points can be exchanged for gifts, or donated to charity projects run by the various participating NGOs. We call them **responsible points**.

In 2011, nearly 2,200 customers donated a total of 8,705,000 points, with an economic equivalence. The HC ENERGÍA FOUNDATION, deeply grateful to its customers, donated an equal sum of money –raised from this initiative.



fundación  
hc energía



## Educational initiatives

### 150 trainees were recruited by HC ENERGÍA to complete work placements

A partnership agreement was signed between HC ENERGÍA FOUNDATION and the University of Oviedo, whereby over a hundred and fifty students undertook a paid work placement in 2011. Trainees were selected on the basis of their academic record and, after a period of six months, many of them were offered the opportunity to extend their contract for a further six-month period. Before students join the company, a welcome course is organised to teach them the basics of the Electricity Business, as well as company policies regarding Quality, the Environment, Occupational Health and Safety, and the company's communication tools (mainly the Intranet).

Once they successfully complete their first semester with us, trainees are given a diploma certifying their work placement. To this end, a ceremony is organised with representatives from both HC ENERGÍA and the University of Oviedo.

### School Visits to HC ENERGÍA

HC ENERGÍA FOUNDATION's commitment to education is also reflected in its comprehensive programme of visits from schools to the HC ENERGÍA facilities. Students from over 3,100 primary and secondary schools visited our thermal and hydraulic power plants in 2011, with the intention to familiarise them with the electric power generation process.

### Universidad Itinerante del Mar (UIM)

HC ENERGÍA FOUNDATION co-operated with the UIM (Travelling University of the Sea), a platform for cooperation within the framework of university student training and projects regarding the sea, which was created by the universities of Oviedo and Porto.

Entitled "The Mediterranean Sea: A link between three worlds. A bi-centenary and many challenges in common", the 2011 campaign hosted a course for 54 Portuguese and Spanish students, who followed the route through Avilés-Porto-Lisbon-Ceuta-Mahón-Cartagena-Cádiz.

### Educating for Sustainability: "¡Viva Nuestra Energía!" School Programme

HC ENERGÍA FOUNDATION's most innovative programme has been an educational initiative which teaches little ones how to be aware of the environment and act responsibly. The "¡Viva Nuestra Energía!" programme ("Long Live our Energy!") aims at raising children's awareness about the benefits of the efficient and safe use of energy, whilst simultaneously teaching them the origins of electricity.

Five main cartoons are used to teach little ones what energy is and how it is produced, as well as renewable and non-renewable sources of energy, and how to use electricity efficiently and safely.

In 2011, over 20,000 school children from Asturias and the Basque Country took part in this programme, which was expanded to Madrid and Murcia towards the end of the year.

# "Viva Nuestra Energía" School Programme

HC ENERGÍA has implemented a school programme called "Viva Nuestra Energía" (Long Live our Energy) to teach children the basics of electric power generation and production, distinguishing between renewable and non-renewable sources. This programme explains the need for both sources to coexist in order to guarantee power distribution, and lays the foundations for us to understand the impact our energy consumption has on the environment.

The initiative develops a teaching unit (approximately one hour long), adapted to students from the phases 1<sup>st</sup> and 2<sup>nd</sup> of Primary Education, that is, children aged 6 to 9 years.

Each session is hosted by expert instructors who use an interactive screen to introduce a series of cartoon characters who lead the journey to "the worlds of renewable energies".

Each of them invites us into their worlds: Lolo Eolo (wind power world), Nano Solano (solar power world), Vera Ribera (hydraulic world), Juan Volcán (geothermal world), and Tomás Biomás (biomass world).

These attractive and innovative videos help instructors and the cartoon characters introduce all renewable sources of energy, and explain how electricity is generated from them. To go on this journey, children are provided with a "passport" which contains information, games, and puzzles.

The Programme includes a section offering advice on energy efficiency and the safe use of electricity. The project is, therefore, designed to raise awareness among children about sustainability, and more specifically, about the benefits of the efficient and safe use of electricity.

Student groups are provided with a sign and additional materials to come up with recommendations about energy safety and efficiency, in such a way that one of their school activities is to create their own "Code of Good Practice", to which they must abide both at school and at home.

The training sessions end with a group edition activity "Commitment to the Earth": "The Planet Earth is in your hands. Help save the Planet. I promise to help". Teaching children these subjects is definitely a guarantee for success. A series of door hangers with eco-efficiency recommendations help children put into practice some good habits to reduce water consumption, and to encourage recycling and energy efficiency at home.

These are just some of the achievements and figures that demonstrate the success of the Programme:

- **The programme originates from the findings of the People's Perception of Sustainability Survey**, which is conducted bi-annually by HC ENERGÍA: The Society requires a higher level of involvement in teaching children about sustainability.
- **The programme was adapted from its successful Portuguese counterpart**, launched by EDP in 2008: "Dá a volta ao mundo con A TUA ENERGÍA" (Around the World with your Energy).



What is the opinion of the teachers from the schools we have visited?

"It's difficult to find such high-quality programmes".

"A surprising staging with varied and quality materials".

"I think it was very interesting, innovative, and motivating for children".

"It was amazing, very amusing, and original. We loved it!".

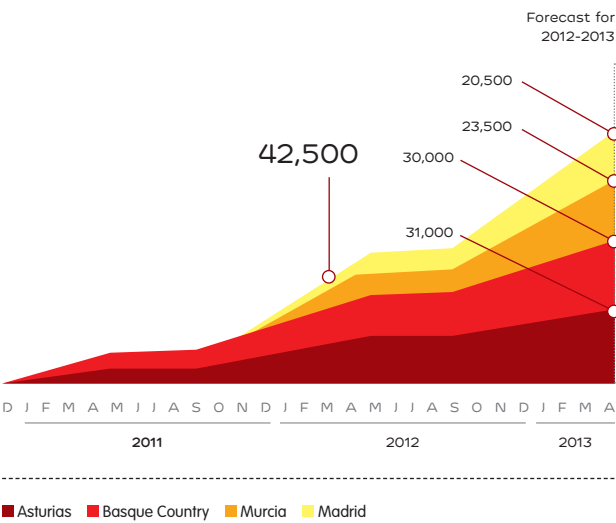
What did we do?

- We adapted the material.
- We networked with the relevant educational authorities to incorporate the programme into the children's curriculum.
- We took on a team of expert instructors who moved around the different schools.

Achievements

- In December 2010, we conducted a pilot project with the participation of our employees' children and the programme was launched in the La Ería Museum, in co-operation with the Town Hall of Oviedo.
- 2011: the project was launched in Asturias and the Basque Country.
- 2012: the programme travelled to Madrid and Murcia.
- 2013: Asturias, the Basque Country, Madrid, Murcia, and perhaps even further afield!

"VIVA NUESTRA ENERGÍA" PROGRAMME:  
2011 PARTICIPATION FIGURES AND FORECAST FOR 2012-2013



## Green Activities

### “Un cliente, un árbol” (“A Customer, a tree”)

With every new customer and every new e-invoice, the Asturian company’s commitment to the environment also grows.

HC ENERGÍA FOUNDATION signed a series of partnership agreements with city halls for the plantation of native trees.

These agreements require that city halls designate some of their areas to sustainable use, while the FOUNDATION is charged with the task of planting and maintaining the trees.

The programme includes the participation of a reputed green organisation FAPAS (Trust for the Protection of Wild Animals), given that the plantation of trees has a double purpose: on the one hand, to increase the tree population in a way which is sustainable and conserves biodiversity, and, on the other, to produce fruits to provide a food source for the local wildlife.

In 2011, 20,000 trees were planted in the towns of Oviedo, Sobrescobio and Siero. If these are added to the existing trees, a total of 50,000 trees have been planted since the beginning of the project.

On the occasion of the third anniversary of the plantation project and with the intention of communicating this initiative, a Nature Party was celebrated on the 18<sup>th</sup> of June at La Acebera Forest (Lugones), where workshops were organised for little ones and 400 trees were planted, involving 5,000 visitors.

### Co-operation with Fundación Oso Asturias

HC ENERGÍA FOUNDATION collaborates with the Fundación Oso de Asturias (Asturian Bear Foundation), a cultural and non-profit private institution created for the promotion and development of activities aimed at protecting Cantabrian brown bears and their habitat.

Its main fields of activity are as follows: raising social awareness about the current situation of the cantabrian brown bear, enhancing environmental education, promoting socio-cultural values related to the bear and the areas it inhabits, and conducting scientific research about the cantabrian brown bear and its habitat.

### Restocking Rivers

The HC ENERGÍA FOUNDATION, in co-operation with the Asociación de Pescadores Amigos del Nalón (Friends of the Nalón River Fishermen Association), works to replace fish stocks in the river Nalón.

In 2011, this activity relied upon the participation of students from the state school Elena Sánchez Tamargo, in Pola de Laviana. The project aimed at raising environmental awareness among children, whilst simultaneously teaching them to respect, encourage and protect biodiversity.

The school children were assigned the task of releasing 12,000 young brown trout, which were raised on the Association’s facilities. The restocking activity was performed in an area where fishing is not allowed. The area did not pose a risk to students, as it is located in the city centre.

The HC ENERGÍA FOUNDATION has been involved in this restocking initiative for several years, with the aim of achieving sustainable development in all areas of company operation.

Not only does it work alongside the Asociación de Pescadores y Amigos del Nalón, but it also participates in various projects organised by other associations, such as the Real Asociación Asturiana de Pesca Fluvial (Royal Asturian Association for River Fishing).

## Cultural Initiatives

### Summer Activities at the Botanical Gardens

For the eighth year running, HC ENERGÍA FOUNDATION and the Cajastur Bank, sponsored the summer activities that took place within the framework of the Summer Evenings at the Botanical Gardens of Gijón.

Asturian mythological characters were hidden behind trees, in the lakes, on paths, and in all the nooks and crannies of the Botanical Gardens, surprising visitors and sharing an hour-and-a-half long walk with those who wished to enjoy a magical light and sound show.

The Gijon Botanical Gardens Magical Evenings started on the 25<sup>th</sup> of July at 22:30 and continued on the 26<sup>th</sup> of June, 2<sup>nd</sup>, 3<sup>rd</sup>, 9<sup>th</sup>, 10<sup>th</sup>, 16<sup>th</sup>, 17<sup>th</sup>, 23<sup>rd</sup>, 24<sup>th</sup>, 30<sup>th</sup> and 31<sup>st</sup> of July, and the 12<sup>th</sup>, 13<sup>th</sup>, 20<sup>th</sup>, 21<sup>st</sup>, 27<sup>th</sup> and 28<sup>th</sup> of August.

The Magical Evenings, a reference to the Gijón summer and the activities at the Botanical Gardens, were designed to once again captivate visitors.

## "The end of the viceroyalties and the process of independence in Latin America"

In 2011, the series of annual conferences organised by HC ENERGÍA FOUNDATION were given the title: "The end of the viceroyalties and the process of independence in Latin America", highlighting the Foundation's interest in discussing relevant historical facts.

Four conferences were delivered by important cultural figures from Spain: Latin America independence projects planned in Spain; a constitutional solution for the Spanish and Portuguese America; Costs and results of the emancipation processes: The Latin American republics and an independent Brazil; and peripheral nationalisms in Spain.

## Partnerships with Other Institutions

### Camerata Revillagigedo's Concerts

The HC ENERGÍA FOUNDATION sponsored a series of Christmas concerts by the Camerata Revillagigedo, starting on Friday the 19<sup>th</sup> of December in St. Martin Parish Church, in Sotrondio.

The choir programme, which was accompanied by the pianist Rosario Álvarez, teacher at the Music Conservatory of the West of Asturias, travelled to four towns in Asturias, giving a typical Christmas programme.

The Camerata Revillagigedo, a project created as part of the Palacio Revillagigedo's International Contemporary Arts Centre of Gijón, performs mainly a repertoire of 20<sup>th</sup> Century polyphonies which, on this occasion, were combined with Christmas music.

The Choir was founded in 1993 by initiative of José Fernández Avello, who has been its director ever since.

### Festival de Ópera de Oviedo

Oviedo Opera Festival is an institution which organises concerts and activities linked with the Opera, including an annual opera season.

### Fundación Príncipe de Asturias

Prince of Asturias Foundation is an institution which initiated the Prince of Asturias Awards in 1981; a series of annual prizes awarded to individuals, entities or organisations from around the world for notable achievements made in the following eight fields: Communication and Humanities, Social Sciences, Arts, Literature, Technical and Scientific Research, International Cooperation, Peace, and Sports.

The ceremony is presided by H.R.H. Prince Felipe de Borbón y Grecia.

### Antón Scholarships

For yet another year running, the HC ENERGÍA FOUNDATION sponsored the Antón Scholarships for sculptors.

Pelayo Varela, an artist from Oviedo, was selected from among 21 candidates to be awarded the scholarship. His proposal is a reflection about the body and memory, and their limits as sculptural materials.

This scholarship, first awarded in 1990, seeks to support, encourage and promote creative activities in the field of sculpture.

## Sports Sponsorship

### Running Races

As is the tradition, in 2011, the HC ENERGÍA FOUNDATION sponsored numerous running races, such as the Ruta de la Reconquista Half Marathon in Cangas de Onís. These running races have become very popular.

### The Asturian Sailing Week

For 13 years now, the HC ENERGÍA FOUNDATION and the Cajastur Bank have been sponsoring the Asturian Sailing Week, which takes place in Avilés, Gijón, Carreño and Gozón.

The 13<sup>th</sup> Asturian Sailing Week set sail on the 19<sup>th</sup> of July and finished on the 24<sup>th</sup>.

# Administrative and Regulatory Bodies

- 82 Regulated activities**
- 82 Electricity tariff deficit**
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a solution to guarantee power supply**



The HC ENERGÍA administrative organisation is composed of a Department of Regulation, which manages and coordinates corporate strategy, representing the company, and mediating with Regulatory System agents.



\* Joaquín Vaquero Palacios.  
*Motifs of Prometheus –the symbol of light and heat– and Atlas –the symbol of strength and movement– at the main entrance.*  
MIRANDA HYDRAULIC POWER PLANT.

### Regulated activities

The HC ENERGÍA Group's core activities consist of the production, distribution, transmission, and commercialisation of electricity, where transmission and distribution are regulated activities.

Regulated activities are subject to the provisions of the Public Administrative Body: given the reliance upon a single network for the transmission and distribution of power supply, a natural monopole has occurred, whose main features are as follows:

- It deals with **capital-intensive activities**.
- **Direct connection** with consumers **is required**.
- **The demand for electric supply frequently varies** in very short periods of time and indeed electricity cannot be stored.

Therefore, remuneration for both transmission and distribution activities is regulated, in order to prevent abuses from the power positions that arise from the existence of a single distribution network. Moreover, the legal distinction between regulated and non-regulated activities guarantees the transparency of this remuneration.

Along with this legal separation, HC ENERGÍA has adjusted its administrative organisation to include a Department of Regulation, which coordinates the company's corporate strategy and gets involved in sector regulations, representing the company and mediating with Regulatory System agents.

### Electricity tariff deficit

In 2011, the tariff deficit continues to be the greatest regulatory problem faced by the current electricity sector.

#### What is tariff deficit?

Tariff deficit occurs because the tariffs paid for by consumers for distribution services are not sufficient to cover the real costs of those services. Spanish utility companies (Endesa, Iberdrola, Gas Natural-Fenosa, HC ENERGÍA, and Eon) are temporarily financing this deficit.

In 2011, the accumulative value of this deficit amounted to 22,500 million Euros across the whole sector. This situation, in addition to the international economic crisis, not only poses a risk to the financial situation of utilities, but also represents a threat to the sustainability of the national electricity system.

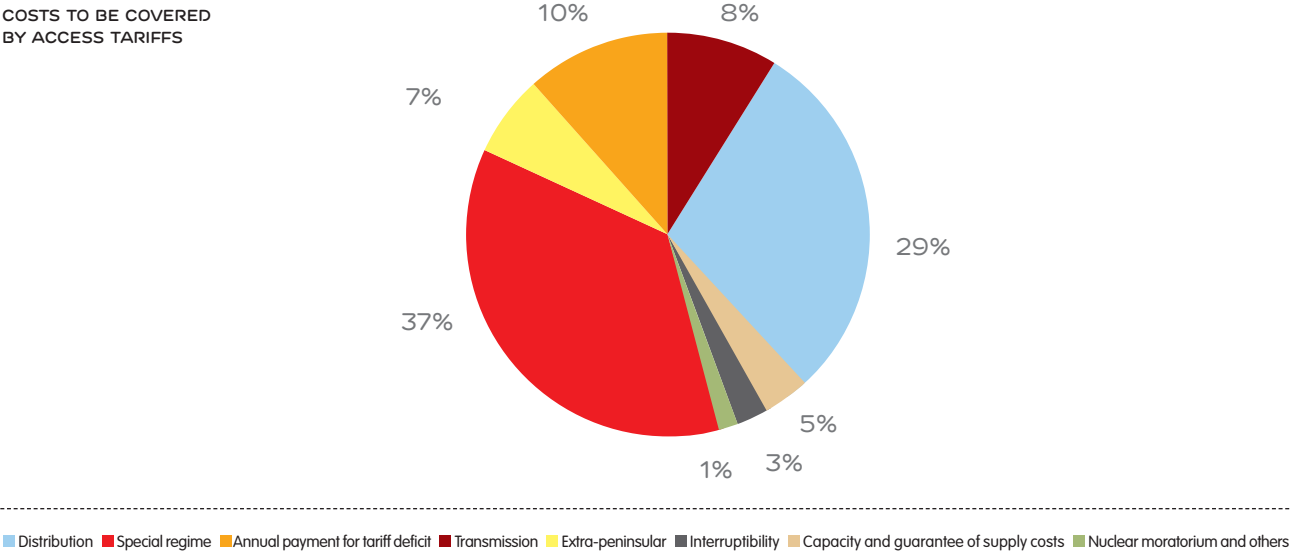
#### What are the real costs of distribution services that should be covered by tariffs?

In 2011, the costs to be covered by tariffs amounted to 18,800 million Euros and can be broken down as follows:

- **8% for transmission**, to finance facilities enabling the transmission of electricity (220 kV voltage or higher).
- **29% in distribution**, to finance electric distribution facilities (voltage below 22 kV).
- **3% for interruptibility**, to offer economic compensation to customers, allowing us to manage national demand by interrupting part or all their power supply.
- **1% for nuclear moratorium and other aspects**, a sum designed to compensate utilities for their substantial investment in the construction of new nuclear power plants that were not completed due to the Spanish Government's unilateral decision to halt construction works; and to pay for the second part of the nuclear fuel cycle (the costs of managing radioactive waste products, and used fuel in operating nuclear power).
- **37% for Special Regime**, an amount required to cover premiums for special regime generation (wind, solar, photovoltaic, etc.), with the aim of promoting and developing these types of facilities.
- **7% for extra-peninsular generation**, that is, to remunerate the costs overrun of generating electricity in the Spanish islands and other extra-peninsular territories (Canary Islands, Balears, Ceuta and Melilla).
- **10% for the annual tariff deficit payment**, to finance the deficit that has accumulated over the last years.
- **5% for the capacity and guarantee of supply costs**; an incentive that, added to the returns yielded in the electricity market, encourages the entry of new facilities into the market and prevents those which guarantee the electricity supply from closure.



COSTS TO BE COVERED  
BY ACCESS TARIFFS



How are these costs collected?

Utilities act as collectors for regulated activities by charging access tariffs. These fees are transferred to the National Energy Commission, which manages their distribution to the various agents performing regulated activities (transmission, distribution, nuclear moratorium, special regime, extra-peninsular services, etc.).

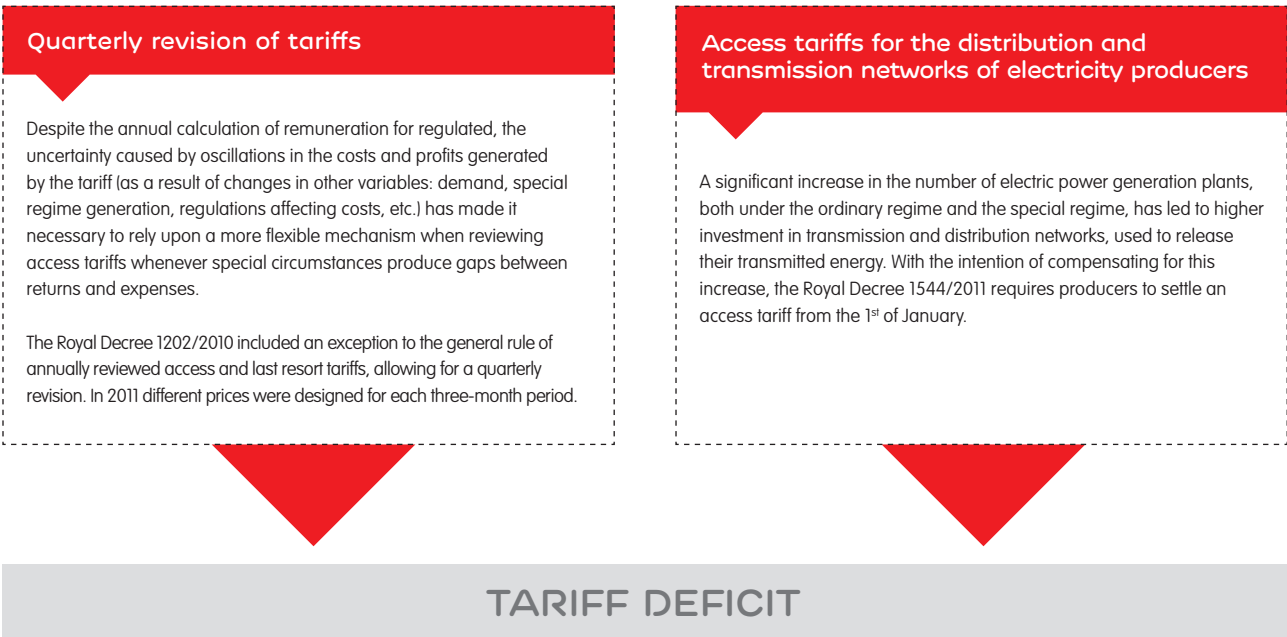
Why are these tariffs not sufficient to cover the real costs of the service?

The reason behind this insufficiency could lie in the liberalisation process. The Ministry of Industry is responsible for setting annual access tariffs. Generally, we can say that these tariffs have historically been very low, so that energy suppliers do not have to carry very high costs when moving utility customers to the free market to encourage the liberalisation of the market.



# Regulations to tackle tariff deficit

In 2011, the most significant regulations adopted were linked to the electricity tariff deficit.



## Availability of installed capacity

This regulatory framework (ITC Order 3127/2011) aims to provide an incentive to encourage the entry of new power plants into the market, thus preventing existing facilities from closure, guaranteeing power supply.

The idea of remunerating the availability of installed capacity involves two services:

- **An incentive rewarding long-term capacity investments**, which has already been implemented.
- **A medium-term availability service**, which is provided for in this Order. This incentive scheme encourages the availability of power plants within a maximum period of one year. Otherwise, these facilities would not be available, threatening power supply in the short and medium term. This involves the participation of major power plants for the electricity system, since they are able to cover peaks of demand and manage reductions. Nevertheless, as a result of the financial crisis (which has led to a sharp decrease in demand) and the promotion of renewable energies, these plants have suffered a decline in their income, entailing a risk to their availability. Therefore, this provides economic incentives for power plants to remain operational and guarantee power supply, and applies to fuel oil, coal and combined-cycle power plants, as well as hydraulic plants (with the exception of run-of-river hydro power stations).

# Capacity payments to power plants: a solution to guarantee power supply

Conventional coal and natural gas power plants are vital for guaranteeing power supply in the Iberian Peninsula.

These conventional coal and natural gas power plants, together with nuclear power stations, are unique in offering firm capacity, that is, a capacity which is not dependant upon external factors (mainly fuel supply), as is the case of renewable energies.

For example, in Spain, there are currently over 20,000 MW of wind power installed capacity. However, exceptional factors may reduce the quantity of wind, leading to minimal plant operation (below 1,000 MW), where conventional coal and natural gas power plants are essential to contribute 20,000 more MW to guarantee power supply. We can therefore conclude that renewable energy power plants cannot offer a reliable guarantee of power supply.

Coal and natural gas power plants are the only ones with a flexible capacity, which are able to instantly respond to peaks and troughs in demand and the variability of renewable energy production, so as to ensure that the generation meets the demand at all times. This function can also be fulfilled by reservoir hydroelectric power plants, but it is subject to reservoir capacity limitations.

Despite the significant contribution made by conventional power plants to the electrical system, returns yielded over the past couple of years are not sufficient to recover costs, given that a significant part of them are fixed (investment and maintenance).

The decline in the electric demand, which is also due to current circumstances, can partly be explained by the infiltration of renewable energies. The increasing use of this type of energy has led to a decline in the part of the demand that was traditionally covered by conventional power plants, whilst simultaneously affecting their income, for they are dependant upon operation. Yet, **renewable energy and cogeneration facilities are offered premiums to add to their production profits, guaranteeing a minimum level of income.**

More specifically, the process of profit generation in a power plant is as follows:

- **Every power plant offers a price** in the auction market on a daily basis. The production mix arising from this auction, called matching programme, decides which plants are going to operate the following day. Profits generated by power plants vary with their production, which is subsequently multiplied by the auction market price. Obviously, if a power plant is not operating, it will not generate any profits.
- **Renewable energy**, cogeneration and nuclear power plants, unable to manage their fuel consumption, always bid at zero to secure a place in the production mix and to remain in operation. The increasing presence of renewable energies in the Spanish production mix has resulted in lower market prices.

- **Additionally, renewable energy** and cogeneration power plants are provided with premiums to add to profits generated in the production market. The initiative behind these incentives is that these kinds of power plants would not be able to compete in the market otherwise, due to their high costs. This is why Governments have decided to introduce them into the market as part of their energy policy. These premiums provide a minimum level of income, allowing these plants to remain unaffected by the price oscillations of the production market. Moreover, premiums are paid for with access tariffs, which are regulated by the Government. Since these tariffs are not sufficient to cover the costs of the system, a tariff deficit or regulated activities deficit is accumulated.

This explains the need for establishing a **capacity incentive**, rewarded to some conventional power plants according to their installed capacity and regardless of their operation.

These payments were **initially introduced to encourage investment in generating capacity or the adaptation of old power plants**, along with a Government promise to keep the incentive for the duration of their lifespan. At that particular time, due to the rapid growth of demand, it was found necessary to invest heavily in conventional power plants to guarantee a firm and flexible capacity.

This incentive, which hardly covered 20% of the fixed costs incurred by the new combined-cycle power plants, was sufficient, since the estimated operation of these plants represented more than 50% of their installed capacity, allowing them to cover another 80% of their fixed costs in the production market.

However, as stated above, the operational levels of these plants have decreased considerably, reaching levels of 20%, which prevent them from recovering their fixed costs on the production market, in spite of the capacity payments. This situation is worsening as market prices continue to drop. This is why **it becomes increasingly necessary to develop new capacity payments that do not only depend upon investments, but also take into consideration the cost of ensuring power plant operation in case renewable energy is not available.**

**The situation started to change in 2011, with the establishment of a new availability service, which recognises the right of conventional and flexible power plants to receive a fixed fee for their availability.** This fee is still far from cover the fixed costs of these power plants, but it obviously makes an important contribution in encouraging operators to keep them fully operational.

# Environment

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All activities performed by HC ENERGÍA have a significant impact on the environment. Let's look at how the company manages these risks so as to minimise any environmental impact caused by its facilities.



• Joaquín Vaquero Palacios.  
*Engine room.*  
MIRANDA HYDRAULIC POWER PLANT.

## EDP Group's commitments

HC ENERÍA, as an utility performing activities related to the production, transmission and transformation, distribution and commercialisation of electrical power, holds the following values and principles which guide its actions, found within its Environmental Policy and in line with EDP Group's commitments.

### Environmental Commitments

**Prevention.** To incorporate respect for the environment and the management of environmental issues into all areas of the value chain, ensuring that all parties involved in our activities adopt a pollution-prevention approach.

**Compliance.** To comply with the applicable legislation and environmental regulations, making sure that our suppliers meet the necessary environmental requirements established by HC ENERÍA.

**Improvement.** To continuously improve our environmental performance by setting targets.

**Awareness.** To raise awareness, educate and communicate to employees the potential impact of their activities on the environment.

**Optimisation.** To promote energy efficiency as a core component of a sustainable use of resources.

**Comprehension.** To listen to the expectations of our stakeholder throughout environmental processes, and act ethically, following principles of transparency, honesty and integrity when dealing with the relevant authorities and other stakeholders.

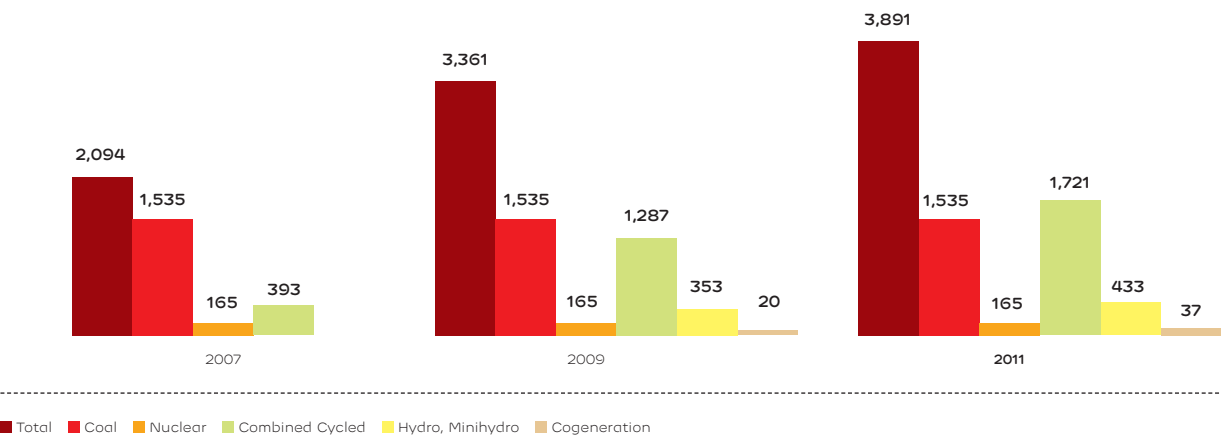
This Policy and our environmental commitments are supported by HC ENERÍA's Department of Environment, Sustainability, Innovation and Quality Assurance, which facilitates the incorporation of environmental and sustainable variables across the business units, in accordance with the objectives stated in the strategic plan:

- **To organise awareness campaigns and training courses** (1,092 hours of environmental training were delivered to 108 participants in 2011).
- **To coordinate and encourage** improvement actions.
- **To ensure full compliance** with applicable environmental legislation and regulations, and control their potential impact.

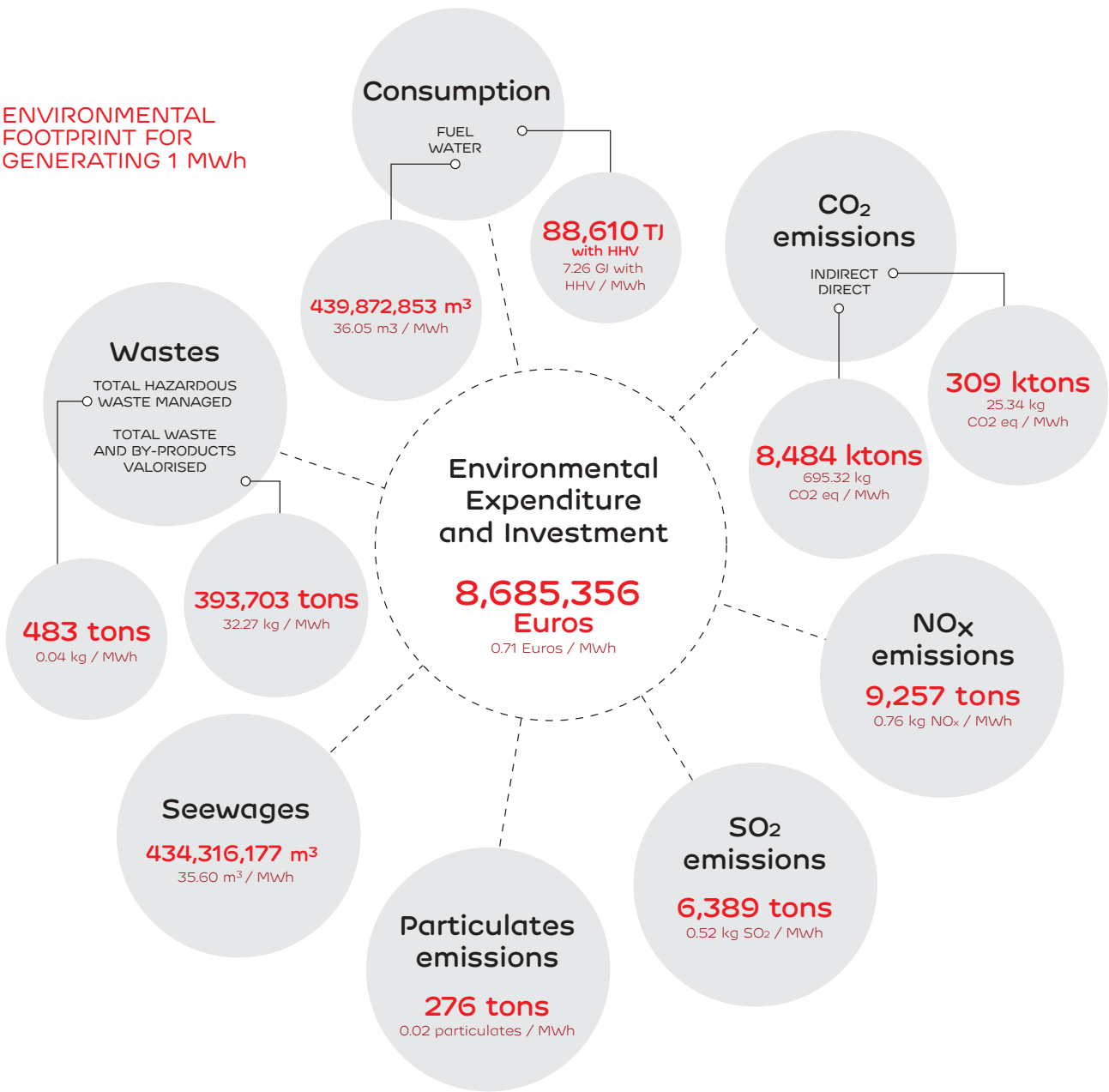
With the aim of ensuring that these objectives are achieved, HC ENERÍA relies upon Certified Management Systems in accordance with ISO 14,001, which guarantees an optimal environmental performance. 97% of our overall installed capacity and 100% of our electrical distribution activities are certified.

Additionally, HC ENERÍA power plants are progressively adhering to the EMAS European Regulation (Eco-Management and Audit Scheme), an voluntary system allowing organisations to assess and improve their environmental performance, as well as to make relevant information accessible to the public and other stakeholders.

ISO 14,001 CERTIFIED INSTALLED CAPACITY (MW)



ENVIRONMENTAL  
FOOTPRINT FOR  
GENERATING 1 MWh






■ Total figures ■ Figures for net generated MWh

97% of the installed capacity and 100% of the distribution activity is certified by **UNE-EN ISO 14,001** Voluntary Standard

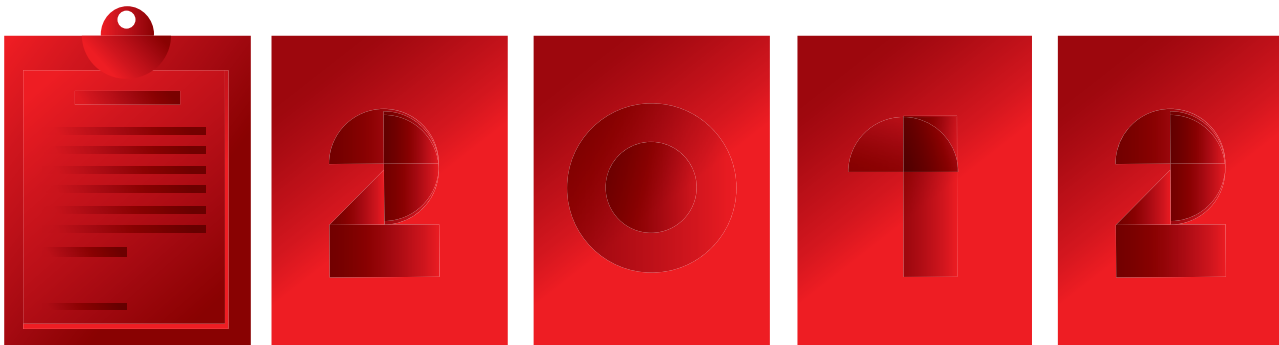
Of all activities performed by HC ENERGÍA, the generation and distribution areas have the most severe impact on the environment. This is why investments are continuously being made to minimise these effects. In 2011, despite the economic situation, these investments amounted to 8 million Euros.

## Priorities for 2012

HC ENERGÍA promotes stakeholder participation in the development of its strategy regarding sustainability. A new survey about this issue was conducted in 2011 and the following priorities were established:

EDUCATION IN SCHOOLS	RESEARCH	EMPLOYMENT AND ENTREPRENEURS
		
<p>The importance attributed to education in schools is one of the most reoccurring features of all surveys conducted to date, constituting an obvious demand:</p> <ul style="list-style-type: none"><li>• <b>To continue undertaking the “Viva nuestra energía” school programme</b>, developing new communication initiatives to increase the presence of programme and its characters.</li></ul>	<p>Research constitutes our second priority, when it comes to making decisions regarding actions to be taken:</p> <ul style="list-style-type: none"><li>• <b>Due to the success brought about by the Innovation event held in 2011</b>, one of our objectives is to <b>frequently host</b> these types of events and circulate relevant information about the sector.</li></ul>	<p>There is a growing concern over employment and entrepreneurs, while interest in scholarship programmes is maintained:</p> <ul style="list-style-type: none"><li>• <b>To reaffirm HC ENERGÍA’s commitment to the Work Placement Programme</b> and other related events, such as the Diploma Award Ceremony, organised in co-operation with the University of Oviedo.</li></ul>





## NATURAL RESOURCES PROTECTION



There is an increasing concern surrounding the protection of natural resources, which is linked to the idea of Sustainable Development:

- **To continue undertaking the Tree Plantation programme** and extend its scope to target groups (volunteers, customers, disabled people, etc.); to draft and distribute a Biodiversity Report, including specific initiatives such as protecting bears, restocking rivers, restoring plots, rescuing birds, etc.

## ENERGY SAVING AND EFFICIENCY



The financial crisis has had an impact on the value of investments made in saving energy and improving its efficiency. Free of charge actions were regarded highly by our survey respondents:

- **To continue adhering to our guidelines:** communication campaigns, security advices in Gas and Electricity domestic facilities, Energy Saving and Efficiency advices, FIDMA (Powerhome, Car-e, Sustainability Area, etc.), subsidies for the replacement of Funciona customer's equipments; Launch R&D&I project, Ecofamilias II with the European Centre for Soft Computing, etc.

## COMMUNICATION CHANNELS AND STAKEHOLDERS



Our actions targeting the general public have a limited impact on strengthening our position on sustainability. Despite our actions having a significant impact in the media, we fail to communicate our specific initiatives regarding Sustainability:

- **To remodel student visits to HC ENERGIA facilities** to best communicate the operational processes of our power plants, as well as our commitment to sustainability. To conduct specific communication campaigns targeting specific groups: vocational training institutions, consumers, firemen and civil defendants, the media, city halls, etc.

## Electricity production and the environment

All activities performed by HC ENERGÍA have a significant impact on the environment. Let's look at how electrical power is generated, the stages at which the environment is affected, and how the company manages these risks to minimise the environmental impact produced in our facilities.

### Understanding how a thermal power plant works

Within the electricity sector, **the highest levels of material consumption occur in thermal power plants, due to the extensive use of fuels:** coal, natural gas, fuel oil, and diesel. Given that all these materials are linked to the technical features of the power plants, they are irreplaceable. Notwithstanding these limitations, the ultimate objective of our operational practices and improvements in process efficiency is to reduce the use of these products, thus minimising their impact.

Along with these traditional fuels, **HC ENERGÍA is unique in the Spanish sector for reusing waste gases** (blast-furnace gas, coke-oven gas and other siderurgical waste gases) from Arcelor Mittal.

These gases are therefore used to produce electricity in both Aboño Thermal Plant and Sidergás Cogeneration Power Plant. The alternative would be to burn these gases in a torch, thus losing any beneficial value.

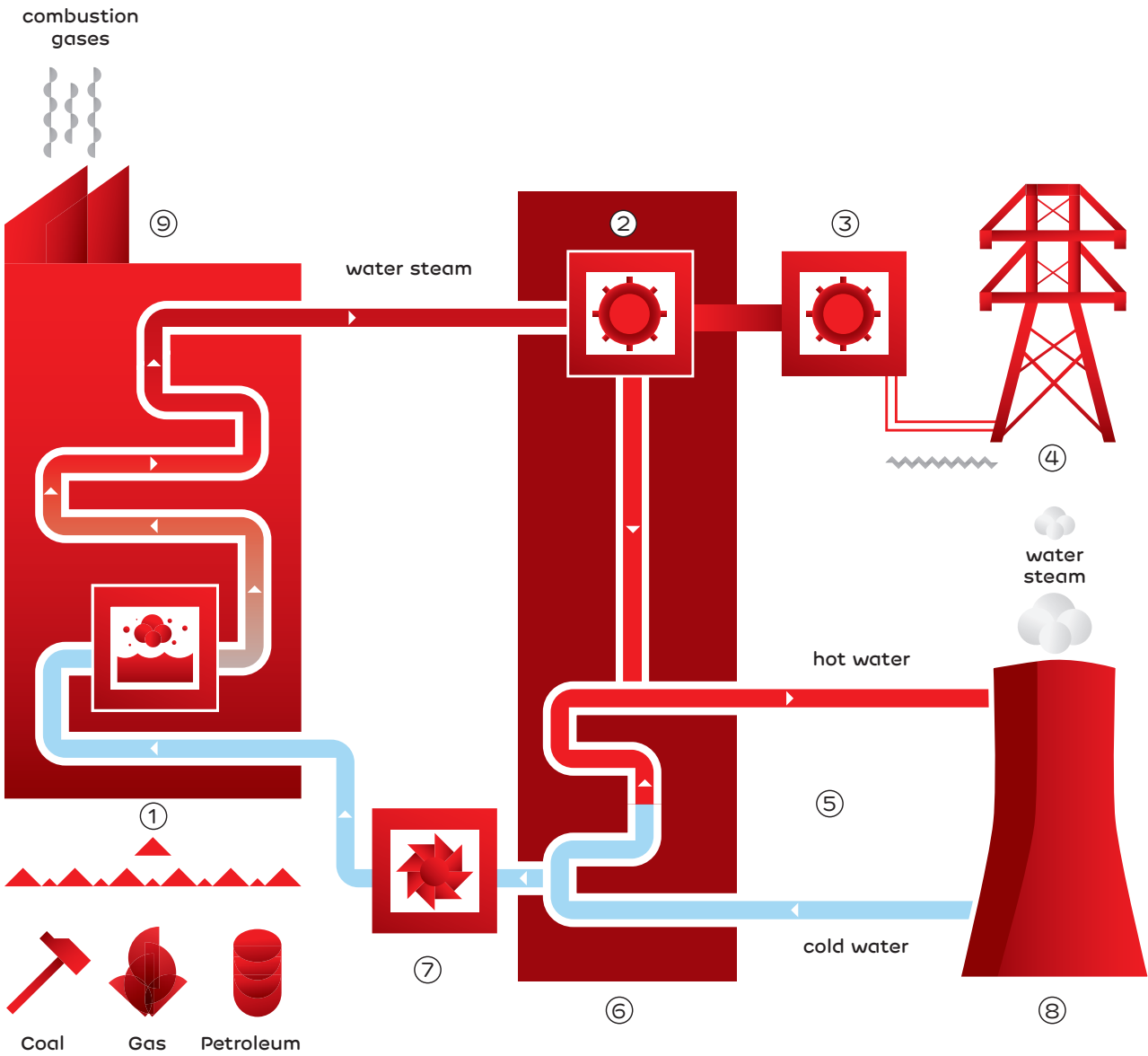
The heat generated when burning these raw materials is used to produce steam which propels the movement of a turbine, thus generating mechanical energy, which is subsequently transformed into electrical power by the alternator.

Steam cools down, releasing condensation heat into the atmosphere, forming a striking column of water steam.

At the same time, combustion gases are released into the atmosphere through the stack, and the wastes generated when burning coal, flying and bottom ashes are collected to be commercialised.

2011 FUEL CONSUMPTION	
Total figures	Tonnes
Coal	2,073,296
Fuel oil	3,849
Diesel	2,738
Total figures	Ndam³
Natural gas	643,756
Blast-furnace gas	2,852,033
Coke-oven gas	74,074
Basic oxygen furnace gas	185,562

Thermal power plant operation scheme



- ① BOILER ② TURBINE ③ ALTERNATOR ④ HIGH TENSION POWER LINE ⑤ WATER CIRCUIT ⑥ WATER-COOLED CONDENSER ⑦ PUMP ⑧ COOLING TOWER ⑨ STACK

## Atmospheric Emissions Control

The most significant environmental concern of a thermal power plant is that of emissions released into the atmosphere, mainly particulates, SO<sub>2</sub> and NO<sub>x</sub>, which react in the atmosphere and deposit on soil and water like acids (Acidification

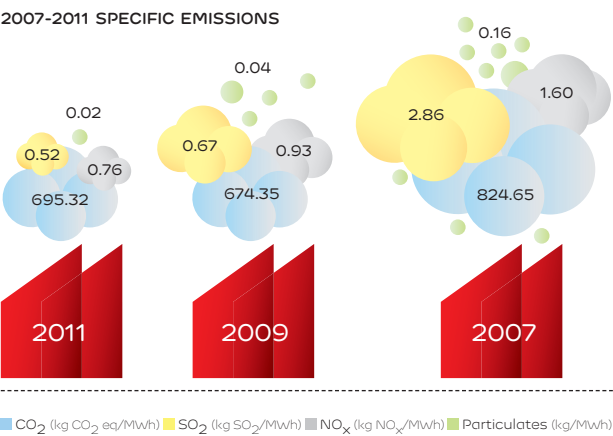
or Acid Rain), as well as CO<sub>2</sub>. Even though the latter is not a real pollutant, its accumulation increases the Earth temperature (Climate Change).

### What is HC ENERGÍA's strategy on cutting down atmospheric emissions?

Our commitment to wind energy through EDP Renewables (company to whom HC ENERGÍA participates 15.5% and which, by the end of 2011, owned over 2,200 MW of the installed wind energy capacity in Spain), **and the investments made in combined-cycles over the years** (which have allowed us to balance the participation of gas and coal in the electrical generation business), have led to the consolidation of the Group's current production mix, enabling a considerable reduction in specific emissions:

#### Combined-cycles

The **advantage of combined-cycles over conventional thermal power plants lies in their greater performance** (55% compared to 30%, on average), due to the utilisation of exhaust gases from the gas turbine to produce steam which is reused in a steam turbine. Additionally, the use of natural gas instead of coal (as fuel) allows for **considerably lower emission levels**, almost eliminating all SO<sub>2</sub> emissions and particulates, and reducing CO<sub>2</sub> emissions by nearly two thirds.



In 2011, CO<sub>2</sub> emissions raised due to National Coal Royal Decree which promotes the consumption of national coal in Soto de Ribera Power Plant as part of Spanish Mining Supporting Plan.

#### Flue Gas Desulfurization Plants

This evolution presented in the specific emissions would not have been possible without the improvements and adaptations made to the existing power plants over the past few years. It is worth mentioning the construction of a **flue gas desulfurization plant**, with performance levels exceeding 90%, in the coal thermal power plants of Soto 3 and Aboño 2, and the installation of new burners which reduce nitrogen oxide (NO<sub>x</sub>) emissions in Aboño 1, Aboño 2, and Soto 3. As for the combined-cycle plants, additional chromatographs have been installed in Soto 4, enabling the regulation of air flow into the gas turbine, thus reducing the combustion temperature, and consequentially NO<sub>x</sub> emissions.

Overall investments in the reduction of NO<sub>x</sub> and SO<sub>2</sub> emissions made by HC ENERGÍA, in accordance with the National Emissions Reduction Plan, amounted to **150 million Euros**

#### Desulfurization

Desulfurization in coal power plants is a process by which exhaust gases are washed with limestone slurry, which reacts and captures sulphur oxides, with a success rate of more than 90%, to produce gypsum. This gypsum is produced in large quantities (65,000 tons a year in Aboño and Soto), and almost its entire quantity is commercialised for use in the construction industry.

## Maximisation of synergies with other industries

HC ENERGÍA works closely with other industries to achieve a global reduction of emissions. It is worth mentioning its co-operation with the iron steel industry, which is represented in Asturias by the ArcelorMittal steel plant, and with the cement industry, through Tudela Veguín.

### Gases from steel and iron production

Gases generated during the steel production process cannot be automatically released into the atmosphere due to their high levels of carbon monoxide (CO). This is why they need to be burnt before they can be released in the form of CO<sub>2</sub>. They can combustion in a torch, or we can find a way to reutilise the gases.

Since 1973, HC ENERGÍA and ArcelorMittal have signed various agreements to ensure that the surplus gases produced in the steel plant during its processes, are transferred to the utility company to be used as fuel in combustion boilers. This activity constitutes a successful exploitation of a pollutant by-product, which helps minimise the global environmental impact.

Furthermore, in Spain, it constitutes a unique case of a partnership between two companies to considerably reduce the environmental impact of their activities.

### Electricity co-generation plants

Co-generation plants are production systems both of electricity and heat from a single fuel. Natural gas is the most extensively used source of energy, but it is not the only one; renewable sources of energy, biomass, etc. can also be used. In a traditional power plant, smoke is directly released from the stack, whereas in a co-generation plant, exhaust gases are cooled down, transmitting their energy to a hot water/steam circuit, to be subsequently released by the stack.

The advantages of the co-generation process are, amongst other things, energy saving, a more reliable guarantee of supply, and the reduction of losses in the electric grid (this is mainly due to the location of co-generation plants close to consumption points).

HC ENERGÍA promotes agreements with other industries to develop co-generation plants. It is worth mentioning the implementation in 2011 of new facilities for the cement company Tudela Veguín, with the aim of optimising energy consumption in the steel and iron slag milling and drying facilities, utilised in the production of highly resistant cement. This enabled the replacement of fuel oil boilers, leading to a reduction in their environmental impact.

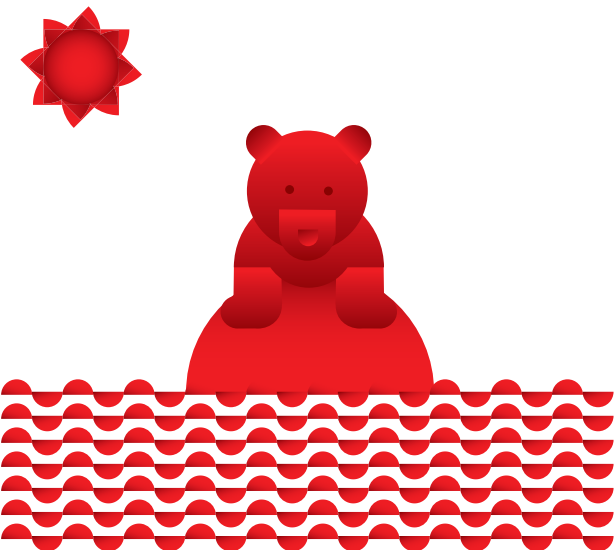
## How can CO<sub>2</sub> emission be reduced?

Currently, there is no technology available to reduce or eliminate carbon dioxide emissions. However, some branches of research are being developed to analyse the feasibility of the capture, sequestration and storage of CO<sub>2</sub>.

This is why HC ENERGÍA has chosen to take part in the Clean Development Mechanism (CDM) projects, seizing the opportunity to fight climate change, whilst simultaneously obtaining emission allowances, as a complement to the operation of its thermal plants.

It is in this spirit that HC ENERGÍA participates in two carbon funds which, in turn, invest in these types of projects across the world:

- **The Spanish Carbon Fund (SCF)**, where the Spanish Government and some private companies participate and whose value amounts to 4 million euros. This fund was created in 2005 and includes projects and activity programmes from around the world, touching on a wide range of issues, such as HFC-23 destruction, waste management, wind and hydroelectric energy, transmission and energy efficiency. The so-called Section 1 (public/private) includes 20 projects at different stages of development, representing a reduction of emissions by 21.91 million tons of equivalent CO<sub>2</sub>.
- **The Community Development Carbon Fund (CDCF)** is valued at 2.5 million dollars. This fund aims at increasing the scope of the carbon market and extending its financing benefits to countries and communities which are struggling in this area due to financial and country risks. The priority is therefore given to small-scale projects in less developed and developing countries. The Fund started operating in 2003, thanks to contributions made by various Governments and private companies which have resulted in 29 projects, at different stages of development, whose generation potential could reach 7.2 million tons of equivalent CO<sub>2</sub>.



# Fighting climate change in the short-term future

Climate Change is a particularly severe problem, as it threatens the whole planet. The international response to this challenge rests upon two legal instruments: The United Nations Framework Convention on Climate Change (adopted in 1992) and the Kyoto Protocol.

## What was the Durban Summit?

The Durban Summit was held from the 28<sup>th</sup> of November to the 11<sup>th</sup> of December. It was the seventeenth conference of the parties within the United Nations Framework Convention on Climate Change (CdP17), and the seventh conference of the parties regarding the Kyoto Protocol (CdP/RdP 7).

## Which were its goals?

On the one hand, the Summit aimed:

- **to solve the problem of the Kyoto Protocol continuity** (it only deals with countries that have ratified the protocol).

And, on the other hand:

- **to clarify the future of the long-term partnership agreement within the framework of the United Nations** (it considers all the UN Countries which adhere to the Convention: over 190).
- **moreover, there were intentions to channel the efforts of both trends** (the Protocol and the Framework Agreement) **into a common framework**.

## What was the European Union's position on the summit?

The European Union promised to approve the second commitment period of the Kyoto Protocol, provided that a "Road Map" was adopted with a **commitment from all countries**. The details of this Road Map would require definition within a period ending in 2015, and, by 2020, it would have to be legally binding.

The road map called for by the European Union, was one of four decisions approved in Durban, so-called **Durban Platform**.



# What is the Durban Package?

The package of measures adopted in the summit is called The Durban Package, and include the following decisions:

**Commitment within the framework of the Kyoto Protocol:**

To extend the current commitment period of the protocol (2008 to 2012). In Durban, Japan and Russian declared their intention to withdraw from the second commitment period; moreover, Canada ceased its participation in the Protocol, even before the expiry of the first commitment period in December 2012. The countries ratifying the second period starting in 2013 should have sent the details of their commitment during the first semester of 2012; the duration of the new period will also be agreed in 2013: either December 2017 or December 2020. The industrialised countries which intend to sign the second period are as follows: the European Union, Australia, New Zealand, Norway, Switzerland, Iceland, and transition countries, such as the Ukraine, Belarus, Kazakhstan and Croatia.

**Durban Platform:** This “road map”, called for by the European Union, is the reason behind the one-year extension of the work carried out by the Long-term Cooperative Action (LCA) group. The intention was to develop, within the framework of the United Nations, a protocol or another legally binding instrument, which would be applicable to all parties. The work must be completed by 2015, in preparation for approval at the Conference of the Parties that will take place that year (CoP 21), and, subsequently come into force in 2020.

**Green Climate Fund:** The commitment made in the Copenhagen Agreement to annually contribute 100,000 million dollars to developing countries in 2020 was reaffirmed. An intense debate was triggered among developing countries on the Fund, given that the sources of financing and the commitments to be made from 2013 were not established.

**Long-term Cooperative Action (LCA):** This aimed at establishing a long-term common objective in the fight against climate change (2050). However, no agreement was reached. Developed countries promised to be specific about their current reduction commitments in 2012, and it was agreed to periodically review the goals set out in the Framework Convention (the first review will start in 2013 and continue through to 2015).

Kioto

What is the action plan put forward by the European Union from 2013?

In parallel with these international negotiations, Europe continues to lead the fight against climate change and is working on the third trading period of the Emissions Trading Scheme (EU-ETS). Following a preparation phase (2005-2007) for the 2008-2012 period provided for by the Kyoto Protocol, the third emission trading period was approved in 2009, to take place from 2013 to 2020.

How is the European Emissions Trading Scheme going to work from 2013?

Common regulations are going to apply to all European Union Member States regarding the free allocation of emission allowances to industrial sectors (excluding the electricity sector), and auctions will become the main mechanism used to provide of allowances to the market. Moreover, aviation (flights from and to European countries) will be included in the current trading system in 2012.

This emissions trading scheme market will be combined with existing flexible mechanisms: Clean Development Mechanism (CDM), that is, projects to reduce emissions in non-developed countries or countries which have not committed themselves to reduce emissions (resulting in Certification of Emissions Reduction - CER); or Joint Implementation (JI), whereby a country invests in another country which has promised to reduce emissions, so that the first country can reduce its emissions at a lower cost than that of doing it internally, and the receiving country benefits from new investments and technology (resulting in Emission Reduction Units - ERU).

What amount of allowances is to be auctioned from 2013 to 2020?

From 2013, power plants will not be allocated any free allowances. Instead, they will have to resort to auctions in order to acquire them. 1,000 million tons of CO<sub>2</sub> are expected to be auctioned annually over the 2013-2020 period. Of them, approximately 84 million will be allocated to Spain.





## How are these auctions going to take place?

The Commission Regulation 1013/2010 includes the timing and all aspects related to the auctions. This document offers a procedure based upon a common space for auctions, including the possibility to develop individual platforms in countries which request it and meet certain conditions. Spain has chosen to participate in the common platform.

## What are the auction funds going to be used for?

A minimum of 50% of profits obtained in the auctions shall be allocated to measures contributing to the fight against climate change. Spain has agreed to invest them mainly in cutting emissions in the so-called "diffuse sectors" (transportation, residential, building, agricultural, and waste treatment) which constitute our main challenge in this field.

## What are the prospects of CO<sub>2</sub> capture and storage?

As a means to finance research into the Carbon Capture and Storage (CCS) and into innovative renewable energies, the European regulation establishes the allocation to these projects of the value obtained in the auction for 300 allowances from the new entrant reserve account. The deadline for applicants to present their projects expired in February 2011. Spain managed to include three projects, whose proposals were forwarded to the European Investment Bank, which will be responsible for the next stage in the selection process. All three projects deal with innovative renewable energies.

## Water management

### Water abstraction

In addition to fuels, large quantities of water are used for electrical power generation in thermal power plants.

- **A part of it** is transformed into steam which, in turn, propels the movement of the turbines and the alternator, producing electrical power. This operation takes place on a closed circuit: steam is produced in the boiler and, after driving the turbines, is condensed once again and returned to the boiler to repeat the cycle. However, small extractions take place during the process, requiring some extra water to compensate for them.
- **A considerably larger part**, is captured and utilised to cool down steam circuits, to be subsequently released into the environment, remaining almost unchanged; and thus enabling its utilisation by downstream users. The most significant alteration is to the water temperature. The Public Administrative body establishes the temperature rise (the difference between the upstream temperature and the discharge temperature) required for the discharge not to affect the receiving environment.

The consumption of water in the refrigeration process is extremely low, there are mainly some water losses due to evaporation (the white steam plumes that we can see coming out from thermal power plant cooling towers). If the circuit is closed, the water flows downwards to the bottom of the cooling tower, to subsequently return to the steam circuit to cool it down.

In reality, this is not a completely closed process. The reason behind it lies in the water lost during evaporation, but it is also due to some water being purged and replaced with fresh water, so as to reduce the concentration of salt.

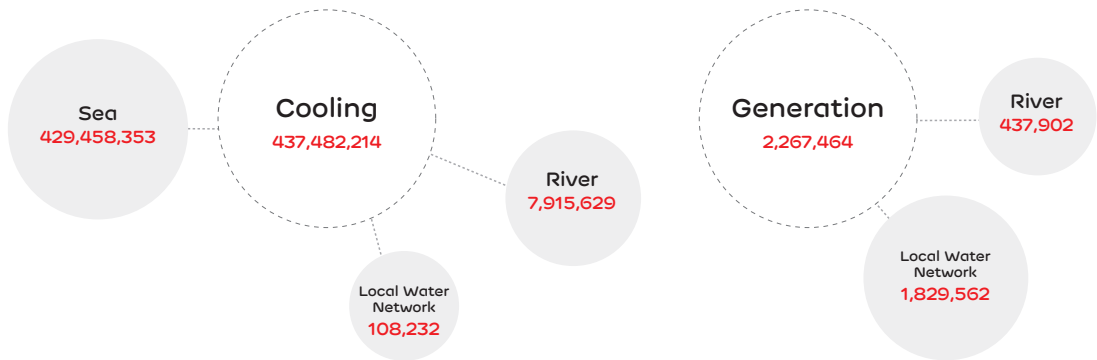
In HC ENERGÍA, the power plants which go through this process are Soto de Ribera (both the coal and the combined-cycle plants), which draw water from the Nalón River (classified as a CIA, Community Interest Area hence requiring special protection for natural habits, wildlife and vegetation); and the Castejón power plants (combined-cycles), which draw water from the Ebro River.

However, Aboño thermal power plant operates an open-circuit cooling system, drawing water from the sea, which is then released back into the sea at a higher temperature.

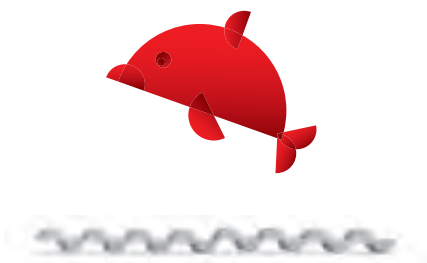
Water is also used to produce electricity in hydraulic power plants. In this case, the water drives the turbines directly, without the need for steam. Therefore, this represents a non-consumptive use of water that does not affect the quality of rivers, as stated in the various River Basin Management Plans.

99% of abstracted water is released back into the receiving environment in conditions which do not alter its quality

WATER ABSTRACTION IN THERMAL POWER PLANTS IN 2011 (m³/YEAR)



Water is the most important resource in hydraulic generation, representing a non-consumptive use of water which is compatible with the environment where it takes place.



- 1 LA FLORIDA  
(NARCEA RIVER CIA)
- 2 LA BARCA  
(NARCEA RIVER CIA)
- 3 MIRANDA  
(SELLA PIGÜENA CIA)
- 4 LA RIERA  
(SOMIEDO CIA)
- 5 LA MALVA  
(SOMIEDO CIA)
- 6 TANES  
(REDES CIA)
- 7 CAÑO  
(SELLA RIVER CIA)

Hydraulic power plants store and regulate water in reservoirs and use it in weir systems and channels (such is the case with run-of-river power plants). Once water has been utilised to drive the turbines which propel the movement of the alternator and produce electricity, it is released back to the environment. Strict quality controls ensure that the quality of the receiving water is maintained, given that this water is classified as a suitable habitat for salmonid fish. Moreover, most HC ENERGÍA plants are located in Community Interest Areas (CIAs).

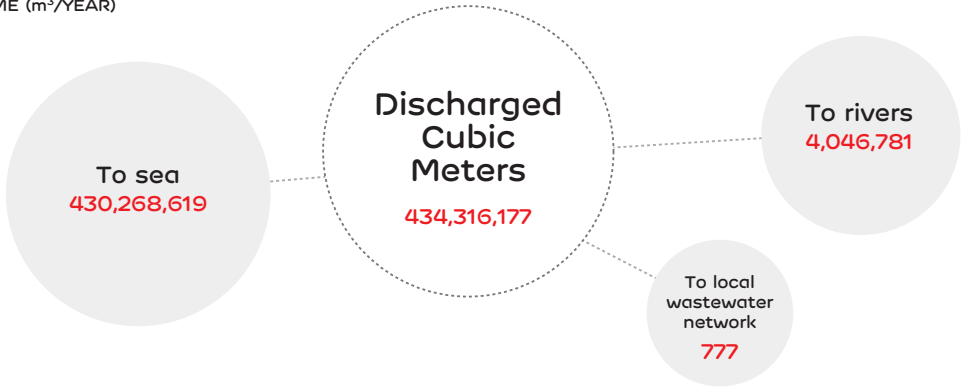
Additionally, with the intention of minimising the risk of adverse environmental effects to this water, hydraulic power plants have developed a substitution plan, by which 100% of mineral oil is replaced with vegetable oil. Completion of this plan is foreseen for 2012.

## Wastewater discharge

The most significant discharge in the electricity sector power plants is that originating from the cooling process in thermal power plants. This discharge leads to a minor modification of the physical-chemical properties of the abstracted water, as well as a rise in the temperature of the receiving environment; this latter effect is continuously monitored, so as to avoid any impacts on the environment.

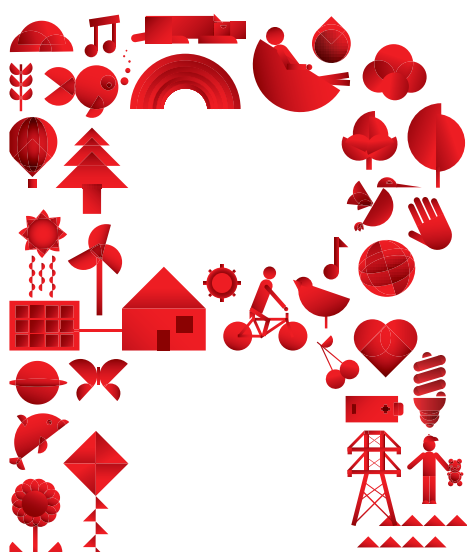
Industrial water (water arising from the various processes that take place in power plants) is properly treated before it is released back into the receiving environment. Pollution levels are permanently controlled to ensure compliance with the applicable legislation and to guarantee that the features of the receiving environment remain unchanged.

DISCHARGE VOLUME (m³/YEAR)



## HC ENERGÍA's participation in the European Week for Waste Reduction

Waste management is based upon the “the 3R’s strategy”: **R**educe, **R**e-use and **R**ecycle.



## Reduction

Try not to produce waste; minimise the use of raw materials; consume less water and less energy.

## Re-utilisation

Try to re-use products or materials to avoid the use of complex treatments or processes; do not throw usable items away; extend the product lifespan.

## Recycling

Utilise used materials in new processes; use waste to create new products.

Despite the existing management policies resting on this strategy, waste generation continues to increase at an annual rate of approximately 1-2%, which greatly complicates waste management, given the need for additional facilities (new solid waste landfills), heavy investment, and the dangerous environmental risks it entails.

With the aim of tackling this problem, the **new European Framework Directive** promotes the legal concepts of “waste reduction” and “preparation for re-use”.

- **Reducing waste generation** means exploring all possible actions before eliminating a product, so as to reduce the quantity and risk factor of the waste produced.
- **Preparation for re-use** includes control, cleaning or repairing operations to enable the re-utilisation of a product or a product component, which other ways would have been turned into waste, without having previously applied any additional treatment to it.

Taking this legal framework into consideration, HC ENERGÍA took part in the European Week for Waste Reduction (EWWR), which was held in 2011 in partnership with the European Commission LIFE+ programme, from the 19<sup>th</sup> to the 27<sup>th</sup> of November. In Asturias, this initiative was coordinated by COGERSA (Consortium for Solid Waste Management of Asturias), with whom we cooperate in various fields.

The Week's goals were as follows:

- **To communicate strategies and policies** regarding waste reduction designed by the European Union and its Member States.
- **To promote sustainable actions** to reduce waste all over Europe.
- **To make the initiatives taken** by the various actors accessible to the public through specific examples of waste reduction.
- **To attempt to change European habits**, in terms of consumption and production.

During the course of the EWWR, participants were offered the opportunity to conduct waste reduction actions and awareness campaigns. These initiatives required previous approval from COGERSA, the regional coordinator of the programme in Asturias, which selected the most outstanding activities for participation in the European Waste Reduction Awards.

Designed sign for the EWWR by HC ENERGÍA, whose motto was  
"Together, to reduce means to act"



SEMANA EUROPEA DE LA  
PREVENCIÓN DE RESIDUOS  
DEL 19 AL 27 DE NOVIEMBRE  
[www.ewwr.eu](http://www.ewwr.eu)



hc energía



Juntos, reducir es actuar

### ¡El mejor residuo es el que no se produce!

En nuestras manos está el consumo sostenible de los recursos y... ¿cómo se hace eso?

**SÉ RESPONSABLE Y SIGUE LA REGLA DE LAS 3 R: Reducir, Reutilizar Y Reciclar**

**Reducir** es fundamental, basta con cambiar algunos hábitos: elige productos que generen menos residuos, aprovecha los productos hasta agotarlos, ...

**Reutiliza** siempre que puedas: utiliza pilas recargables, bolsas reutilizables... y si ya no los necesitas, dona tus juguetes, ropa, móviles... y otras personas podrán reutilizarlos. Entra en nuestra web y descubre cómo hacerlo: [www.sostenibilidad.hcenergia.com](http://www.sostenibilidad.hcenergia.com)

Cuando no puedas reducir ni reutilizar, **Recicla**: utiliza los contenedores y puntos limpios cercanos a tu casa o a tu cole, para que se puedan reciclar.

¡Qué desperdicio!

Cada año, en Europa, se tiran 52 kg de residuos por habitante.

Cada persona deshecha una tercera parte de los alimentos que adquiere.

### Cómo prevenir los residuos día a día:

- Cuando estés preparando la vuelta al cole, **reutiliza todo el material que puedas** del año anterior.
- Opta por productos **recargables, reutilizables y sostenibles**.
- **Imprime sólo las copias que necesites** y, siempre que puedas, hazlo por las dos caras.
- **Utiliza lámparas de bajo consumo**: duran más y ahorrarás en tu factura.
- **Disminuye los residuos de embalaje** comprando productos a granel (agua, carnicería, frutería...).

Sabías que... ?

- Por cada tonelada de papel 100% reciclado se evita la tala de 15 árboles.
- Con la energía que se ahorra reciclando una botella, podrías encender una bombilla de 100 W durante 4 horas.
- Cambiando 5 bombillas por 5 lámparas de bajo consumo (28 W) puedes ahorrar 60€ al año en electricidad y reducir 340 kg la emisión de gases de efecto invernadero.

[www.sostenibilidad.hcenergia.com](http://www.sostenibilidad.hcenergia.com)

HC ENERGÍA participated with its initiative "HC ENERGÍA and its *stakeholders*: an integrated strategy for communication", which was recognised at a regional scale in the Business/Industry category, allowing us to qualify for the European Award, for which a winner will be selected in Paris in June 2012.

The project was compiled of 12 specific initiatives, each sharing a common objective: to raise awareness among all the company's stakeholders. The project highlighted existing initiatives regarding waste reduction and minimisation, whilst simultaneously developing new ones, which had been specifically designed for that Week. The success of all our actions reflected the good relationship we have built with our stakeholders.

Four actions were designed for the stakeholder group "Employees". It is worth mentioning the first report from CEO Joao Manso Neto, in which he supported the initiative and highlighted the numerous actions undertaken by HC ENERGÍA in this field, whilst calling for the participation of all employees.

Our **employees** also took part in various training and communication activities, and actively participated in a household collection campaign. This campaign collected textiles (clothing and home linen), books, CDs and home accessories, to be donated to the charity Fundación Social EMAÚS, which organises workshops and social programmes to distribute donations among vulnerable people, in an effort to improve their living conditions.

In that same week, our **customers** were informed of a major achievement: 200,000 new customers had signed up for the e-invoicing programme. This action enables us to considerably reduce the consumption of paper (by over 4 tonnes every year), which indirectly leads to a reduction in CO<sub>2</sub> emissions (by over 8 tonnes).

The Society targeted 6 actions.  
3 of them are remarkable for the considerable impact they made:

- A new section was created on our sustainability website, [www.sostenibilidad.hcenergia.com](http://www.sostenibilidad.hcenergia.com), which focuses particularly on waste. The intention of this section is to raise people's awareness about the problems linked to waste generation and, at the same time, communicate good practice in waste reduction and/or waste preparation for recycling.

The screenshot shows the 'sostenibilidad' (sustainability) section of the HC ENERGÍA website. It features a circular diagram with a red flower-like center, surrounded by ten icons representing different waste management and resource conservation topics: 'agua' (water), 'energía' (energy), 'residuos' (waste), 'productos químicos' (chemical products), 'transporte' (transport), 'compra' (purchase), 'uso de recursos' (use of resources), 'reciclaje' (recycling), 'energías renovables' (renewable energy), and 'eficiencia energética' (energy efficiency). The text '¿Cómo gestiono los residuos?' (How do I manage waste?) is prominently displayed, along with a sub-header '¿Cómo gestiono mis recursos?' (How do I manage my resources?). A sidebar on the left lists various sustainability topics.



- During the course of that week, the “Viva nuestra energía” programme (“Long live our energy”), which runs throughout the year, included specific activities regarding waste reduction. More specifically, instructors developed a student workshop to identify waste reduction actions that could be taken in their own schools and homes. From the actions suggested by school children, a contract was drafted for all children to sign, in which they undertook to “take care of the Earth and prevent waste production”.



- The first “Recycling Workshop” took place with **high levels of participation**. The workshop targeted employees’ children, who created crafts from recycled materials; coffee capsule necklaces and Christmas-tree decoration, cardboard photo frames, little cork and felt warriors, and bracelets and key-rings made with pull-tabs.



Lastly, one day was dedicated to the “Suppliers” stakeholder group. A workshop was organised under the title of “Continuous enhancement in Environment and Prevention”. One of the items on the agenda was waste reduction. Several plans and initiatives

conducted by HC ENERGÍA were presented in an attempt to communicate good practice to our Partner Companies, which could then be integrated into the activities they perform in our facilities.

# Waste management and recovery

HC ENERGÍA's waste management policy is based upon "the 3R's strategy" and the concepts of "waste reduction" and "preparation for re-use".

## What do we do with every bit of waste and by-product?

The main non-hazardous waste and by-products generated by HC ENERGÍA are flying and bottom ashes from the combustion of coal, and the gypsum produced in the desulfurization plants.

As for hazardous waste, the most significant ones (due to their high volume) are oils with high levels of PCB that can be found in some transformers. This oil was traditionally used as an electrical insulating material, until it was discovered that it was a potential source of pollution for the environment.

### Non-hazardous waste

#### Flying and bottom ashes

If we take volume into account, the most relevant waste products generated by HC ENERGÍA are the flying and bottom ashes produced during the coal combustion process. These products are classed as non-hazardous waste.

The useful properties of this type of waste make them usable in the construction industry and other ancillary sectors, both for the production of cement (as filler material for clinker) and mortar, and as fillers in the construction of linear infrastructures, due to its geotechnical features.

Soto de Ribera and Aboño thermal power plants ensure the storage of every batch of waste, which due to its nature, cannot be re-used. Materials are stored under strict security conditions in specially-designed dumps.

#### Gypsum

The gypsum produced in the Desulfurization plants located in Aboño 2 and Soto de Ribera 3 is no longer classified as non-hazardous waste, but as a by-product, which facilitates its commercialisation.

This way, HC ENERGÍA is able to commercialise the entire quantity of gypsum generated in these plants, which are bought by building material manufacturers (plasterboard panels and other similar products). Off-specification and surplus gypsum is kept in special designated and equipped areas in the plants.

### Construction and Demolition Waste (CDW)

Construction and demolition waste (CDW) is generated in civil engineering projects, mainly in Network Expansion works.

The legal framework establishes that every project shall include a Waste Management Study, and the Contractor Companies which are allocated the construction works have to submit a Plan specifying how waste is going to be managed throughout the project, prioritising recycling over landfilling, establishing waste segregation criteria according to the nature of the work, and specifying in advance the amount of waste that will be generated.

The final destination for all waste is an Authorised Management Company. Some guarantee recycling through the production of graded aggregate, which meets the technical requirements for re-use in gas and line undergrounding works.

### Separate collection waste: Similar to household waste

The waste collected through the separate waste collection systems in our facilities (blue, yellow and green bins) is recycled.

This is when "preparation for recycling" becomes extremely important for the subsequent re-use of waste, which is why we constantly highlight the need for separating waste properly, and discourage the disposal of other materials in these bins (particularly hazardous products).

The paper from the blue bin and the plastic from the yellow one, are collected by COGERSA, which then transfers them to an ECOEMBES treatment plant (the Integrated Management System which recycles this type of waste).

Similarly, the glass collected by COGERSA is taken to ECOVIDRIO, the Integrated Management System for this type of waste.

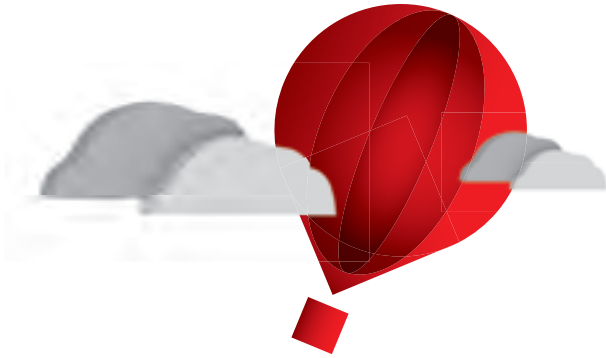
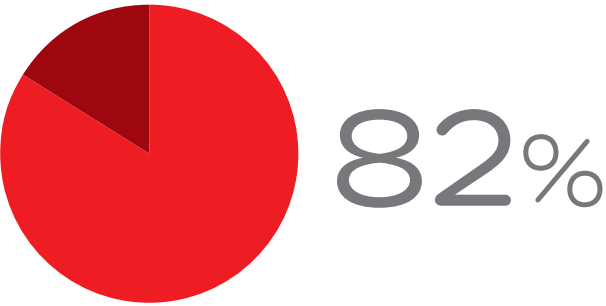
Non-separated rubbish is taken to the Central Dumping Site of Asturias, at La Zoreda, which is managed by COGERSA. This solid waste landfill enables the biogas generated throughout the decomposition process of organic material to be recovered. The energy recovery of this product is linked to its utilisation as the main fuel by the Bioastur plant, where electricity is produced for the dumping site's systems and processes (auto-supply). The surplus electricity is delivered back to the grid. 50% of the plant is owned by HC ENERGÍA.

### Other non hazardous waste: scrap

Scrap is collected for recycling by management companies, duly licensed by the relevant authority (Consejería de Medio Ambiente - Regional Environment Authority). Given the geographic spread of the plants and the volume of their waste, a unified procedure is followed for waste collection.



PROPORTION OF WASTE VALORISED



Hazardous waste

PCB

**Hazardous Waste** is produced in larger quantities by HC ENERGÍA Group while performing activities related to electrical distribution: polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT) are persistent chemicals traditionally used in electrical transformers and capacitors for insulating purposes. Due to their severe impact on the environment (ecotoxicity and bioaccumulation), they have been banned from use and are being progressively replaced by other products.

The legal time limit for the complete disposal of these PCB-contaminated (containing over 500 ppm) transformers expired in 2010.

Contaminated equipment containing lower levels, which under the applicable legislation can be held until the end of its lifespan (quantities ranging from 50 to 500 ppm), have continued to be voluntarily withdrawn from “sensitive” areas so as to minimise the potential impact on the environment.

Moreover, HC ENERGÍA promotes the **Valorisation of hazardous waste**. In this spirit, the licensed management company collecting the waste removes the PCB from the oil of transformers in order to recover the remaining materials, namely copper.

The contaminated oil is incinerated at a special plant.

Waste Electrical and Electronic Equipment (WEEE)

Waste electrical and electronic equipment, due to its nature, relies upon an Integrated Management System (IMS), requiring the collection and treatment of products at the end of its lifespan. These products are treated at no expense to the user given the fact that the market price of every product already includes the cost of this service (eco wee or eco-tax).

HC ENERGÍA has signed a partnership agreement with Ambilamp, an IMS for the collection and treatment of WEEE lamps. A similar agreement is expected to be reached in 2012 for the collection and management of meters and other measurement equipment which are to be withdrawn as a result of the integration of Smart-grids, and related Meter Replacement Plans.

Other hazardous waste

The following waste products are considered hazardous: used oils, fats, lubricants and coolants; impregnated cloths and cotton, contaminated containers (plastic and metallic), aerosols, paint waste, solvents, etc.; and are generated in the course of the maintenance activities performed in our facilities.

All HC ENERGÍA facilities dispose of recycling centres with clearly-marked bins to facilitate the safe segregation of the various types of waste for recycling. This enables the subsequent collection of waste by Licensed Management Companies, which then perform several recovery and destruction processes, such as the energy recovery of oil in specific thermal power plants.

## Biodiversity

The construction of new facilities raises several environmental concerns. Amongst them, it is worth mentioning changes in land cover and land use, the potential hydro-geological risk, the cutting and clearing of vegetation, the threat to wildlife (destruction of habitats and displacement), and the transformation of natural landscapes.

HC ENERGÍA identifies and assesses these impacts at the project stage, in such a way so as to include the necessary preventive and corrective measures required to ensure that the project is compatible with the environment.

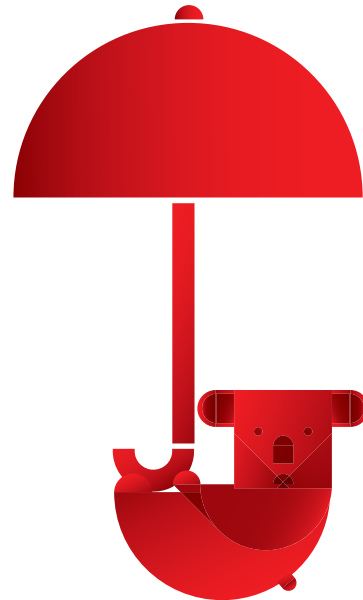
These measures are analysed both through mandatory Environmental Impact Assessments, and in other compulsory or optional studies, which may also include modelling processes and other specific assessments which analyse the effects on a particular habitat or species, if necessary.

At the construction phase, potential impacts are followed up with specific Monitoring Plans, which are subsequently adapted to the Operation Phase, to guarantee a continuous monitoring of the facilities whilst taking into consideration all environmental aspects.

## Electrical distribution

The most significant projects carried out in 2011 came from the Networks Department, which simultaneously completed the implantation process and certification of the Environmental Management System (EMS), extending its scope to all activities and newly-constructed facilities. This EMS ensures the identification and control of all environmental impacts.

It is worth mentioning the construction of Romió Substation and the extension of Salas Substation, in which the environmental monitoring process has been undertaken by the contracting company. Moreover, building works for both the Substation at the Gijón Harbour and the Carriño-Musel Underground HV line have been monitored in coordination with the Port Authorities. Furthermore, the San Claudio Substation project has already been initiated. The acoustic impact had to be modelled in order to optimise the construction of the final project.



Along the same lines of protecting Biodiversity, it is worth highlighting the drafting of a **“Comprehensive manual for felling, pruning and clearing in HC ENERGÍA easement areas”**, which allows us to combine the maintenance and cleaning of aerial power lines (in accordance with the applicable legislation) with the protection of the habitats and species included in Red Natura 2000.

The manual describes the procedures to be followed in order to control the vegetation that grows under the lines, regarding the felling of fast-growing tree species, the manual felling of supporting structures and the pruning of tree branches that grow on the side lines (in the direction of the cables). In 2011, the lines crossing areas listed in Red Natura 2000 and priority habitats were outlined in the Distribution Area's Geographical Information System, so that sensitive areas could easily be identified and taken care of at every stage of the process.

There are other relevant biodiversity management measures in the Networks Area:

- **The installation of bird-protection devices**, both structural (support structures and insulation), anti-collision and bird scarers.
- **Power lines lying with helicopters** to avoid causing an impact on habitats as a result of the use of machinery.
- **Eliminating the risk of a PCB oil spill from outdoor transformers in protected areas located less than 50m from a river**: The solution has been to replace these transformers (9 in total) with biodegradable-oil ones, which were ordered in 2011 to be installed over 2012.

# Electrical power generation

The main biodiversity management actions taken in the HC ENERGÍA power generation facilities comply with the Environmental Responsibility Act.

Therefore, we are working on identifying and listing nature protection areas, habitats and representative wildlife species. Moreover, aquatic environment research studies are being conducted in the areas where we operate, with the intention of determining the original conditions of these areas and establishing necessary practices to minimise the risk of an effect.

## Environmental Risk Analysis

An Environmental Risk Analysis (ERA) was conducted in La Barca Hydraulic Power Plant in 2011. The environmental characterisation process (original conditions) was performed adhering to the guidelines of the methodology utilised in Soto de Ribera Combined-Cycle Thermal Power Plant ERA in 2010. The research study has been combined with field work to confirm the current environmental conditions. Moreover, a list of characterisation indicators was included to identify ecosystem services (based on the Millennium Ecosystem Assessment).

In Tanes Hydraulic Power Plant a similar ERA was conducted, also including some fieldwork. This project was performed in line with an agreement with the Environmental Regional Authority of Asturias, which selected our facility due to its unique nature (it is the main drinking water supply point in Asturias). Results will be communicated to the Environmental Administration of Asturias, and may inspire future projects. This particular study includes a list of indicators which identify the ecosystem services to enable their follow up in the future.

Environmental Risk Analyses have also been initiated in cogeneration power plants, more specifically, in the Sinova pig manure waste plant, including the characterisation of original conditions.

## Aquatic environment research studies

The ecological characterisation of the Nalón River was conducted in 2011, in the surrounding area of Soto de Ribera thermal power plant, in accordance with the Water Framework Directive. Biological indicators are of great importance in these kinds of studies, as opposed to more conventional indicators, such as physical-chemical ones. This process had two different stages: the first included a sampling procedure to establish the current ecological status; the second will take place in spring 2012.

Additionally, in 2011, we started planning the monitoring works for the trophic status and environmental potential of HC ENERGÍA's reservoirs. These works will be initiated in 2012 in accordance with the objectives of the Water Framework Directive, and will include the establishment of the physical-chemical and biological variable to be taken into account in order to establish the trophic status and ecological potential of water bodies, sediments analyses, the upstream and downstream ecological status and bathymetry, amongst other considerations.



# R&D&I

- 113 Flexible and widely available generation
- 113 Power efficiency and microgeneration
- 114 Grids and power storage
- 115 Smart-grids: replacing meters
- 116 Electric vehicles



HC ENERGÍA Group has established four R&D&I strategic objectives that will allow us to focus on the technologies which will respond to possible challenges and environmental issues that the company's business units will have to face in the future.



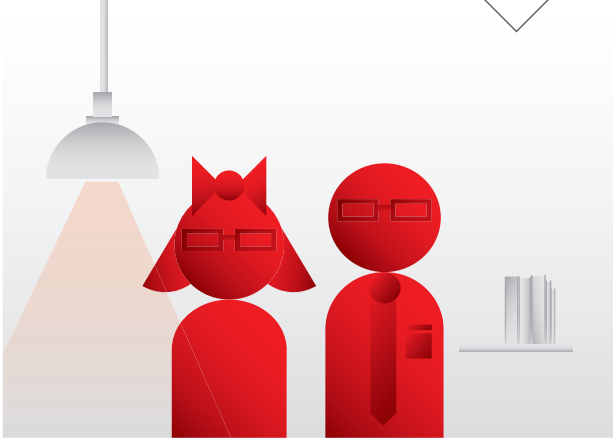
• Joaquín Vaquero Palacios.  
*Wall painting with magnetic fields in engines room.*  
PROAZA'S HYDROELECTRIC POWER PLANT.

HC ENERGÍA's R&D&I  
sustainability strategy

① **Flexible** and widely  
available **generation**



② **Power efficiency**  
and micro-generation



③ **Networks and**  
power **storage**



④ **Electric vehicle**



## Flexible and widely available generation

With the intention of optimising the Group's energy management and maximising participation within the electricity market, several projects aimed at increasing the availability of our power plants have been established.

### "Enhancing alternator availability in cogeneration power plants"

The objective is to broaden our knowledge by analysing alternator currents, as an efficient tool to define problems that cannot be identified by other means.

To this end, the necessary components will be incorporated so as to permanently monitor alternators in all three HC ENERGÍA combined heat and power plants (CHP) in Asturias (Sidergas, Tudela and Sebares). In 2011, the University of Oviedo developed a data collection system for application in this project.

### "PETROFUTURE Project"

This aims at implementing an inspection strategy for heat-recovery steam generator in combined-cycle gas turbine plants (CCGT), based on the existing risk of damage to the boilers. The necessary information for risk assessment will be obtained from several measurements taken under different operational conditions, as well as from start-up and shut-down cycles.

The first step on this project was for HC ENERGÍA to conduct a technical feasibility study of its facilities through 2010 and 2011.

### Spanish Technology Platform for CO<sub>2</sub>

This Platform, created in 2006, aims to contribute to the improvement of energy efficiency in large industrial facilities, as well as to develop and introduce CO<sub>2</sub> capture, transmission, storage and utilisation technologies, in an attempt to facilitate Spain's compliance with its commitment to reduce emissions. HC ENERGÍA is a member of its Governing Board.

## Power efficiency and micro-generation

This strategic line includes projects concerning demand management, the development of micro-generation, and loss-reduction in conductors and transformation centres.

### Spanish Technology Platform for Energy Efficiency ([www.ptee-ee.org](http://www.ptee-ee.org))

The Spanish Technology Platform for Energy Efficiency was created in 2008 with the aim of innovating the use of product and service technology in an attempt to promote a more intelligent and sustainable consumption of all types of energy.

This platform brings associations, research centres and Spanish companies together. HC ENERGÍA, one of its members, is represented in the Platform's Governing Board and co-leads one of the six working groups within which all the activities are performed. 3 seminars were hosted by the Platform in 2011, in Barcelona, Vigo, and Madrid.

### ENRIMA Project: Energy Efficiency and Risk Management in Public Buildings

As part of the Seventh Framework Programme of the European Community for Research and Technological Development (FP7), HC ENERGÍA participates in the EnRiMa project. The main objective of this project is to develop an integrated management system which enables energy efficiency in building and special infrastructures, minimising costs, managing risks, and meeting the requirements of improved energy performance, efficiency and reduction of emissions.

In 2011, HC ENERGÍA led the projects which gave rise to the document "Requirement Assessment: EnRiMa Validation Test Sites Report". The data collected in the micro-CHP unit, installed by the Group in the Fundación FASAD's facilities in 2010, was used for these purposes.

# Grids and power storage

Within this strategic context, HC ENERGÍA carries out R&D and technological innovative projects and activities focusing on the predictive maintenance of networks and energy storage.

## REDES 2025: A Singular and Strategic Project ([www.redes2025.com](http://www.redes2025.com))

The first R&D&I initiative promoted by the Spanish Technology Platform for Electrical Grid is REDES 2025: A Unique and Strategic Project. This project is composed of six sub-projects, of which, HC ENERGÍA leads the one regarding the storage of electrical power, which aims at developing a high-capacity storage system to be used both in industrial and commercial activities and applied to medium-voltage and low-voltage electrical grids.

In 2011, HC ENERGÍA began cooperation with its partners in the drafting of a document called "Screening active components".

## INNPACTO REDOX 2015 Project

The Ministry of Science and Innovation decided to no longer use the format Unique and Strategic Projects, which required REDES 2025 SSP's members to continue working on their sub-projects within the framework of a new project.

More specifically, the members of the Storage sub-project, under the leadership of HC ENERGÍA, adopted a new project to cover the ongoing sub-projects on which they were working. The project was given the name REDOX 2015 and was submitted to the INNPACTO funding project. REDOX 2015 was approved by the Ministry of Science and Innovation in December 2011.

## Failure Detection and Localisation Project

The "Failure Detection and Localisation" project aims to develop specific measurement equipment to enable the detection of power supply failures in underground networks, through the analysis of partial discharges. In 2011, this project allowed for the continuation of the results achieved in the project CENIT DENISE (Intelligent, Secure and Efficient Energy Distribution), which ended in 2010.

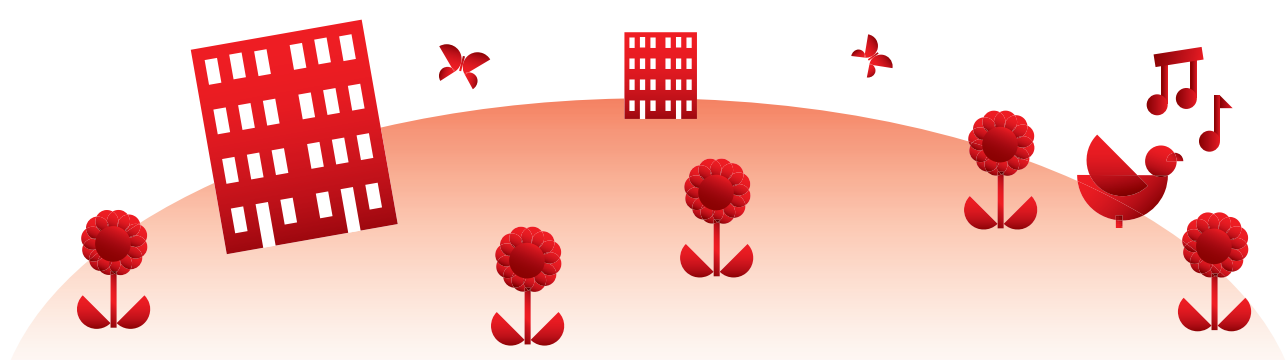
## Spanish Technology Platform for Electrical Grids "Futured" ([www.futured.es](http://www.futured.es))

This Technology Platform initiated in 2005 with the intention of bringing together all the actors involved in defining and boosting R&D&I in Spain, with a specific focus on Spanish electrical grids for transmission and distribution. In the future, the so-called "smart grids" will have to effectively respond to the incorporation of renewable energies, with a double challenge: their rapid growth and decentralised nature.

Futured actively participates in a wide range of activities, among which is the noteworthy organisation of seminars in various Spanish cities. They promote the development of projects within the Platform, in which HC ENERGÍA participates through its presence in the Governing Board. In 2001 four projects designed by the platform (one of them led by HC ENERGÍA) were supported by the Science and Innovation Ministry's funding project Innpacto.



# Smart-grids or intelligent networks: replacing meters



The world energy consumption has risen due to an increase in the population (particularly in urban areas) which, together with the change of generation strategy (as a result of higher fuel prices and the development of renewable energies), has created the need for a smarter and more stable distribution network: a network capable of integrating all actions taken by users connected to it (producers, consumers and those performing both roles at the same time), in an attempt to provide a more efficient, sustainable, affordable and safer electrical power. This network was given the name of SmartGrid or Intelligent Network.

This “intelligence” is defined by its control, decision and action capabilities within the various levels of the distribution network. This way, it entails the implementation of a remote management system, with the measurement equipment and meters necessary for it to operate. This includes metering, energy management, requested-capacity control, supply connection/disconnection management, and advanced anti-fraud mechanisms. It enables information and action exchanges between utility company systems and the meters, thus eliminating the need for household assistance, and the resulting inconvenience caused to the customer.

The starting point for the implementation of the remote-control system and the launch of the campaign to replace meters was 2007. However, it was not until 2010 that the first equipment featuring the desired specifications was launched onto the market. Once meters were delivered, and with the intention of testing their functionality,

pilot projects were conducted prior to the general installation in all customer facilities.

Once the various pilot projects were finalised, HC ENERGÍA started the campaign for the replacement of meters, targeting the replacement of 34,000 supplies in the areas of Oviedo and Gijón, prioritising relatively newly constructed groups of buildings to facilitate remote management. By the 31st of December 2011, 47,471 meters had been replaced (as a result of the meter replacement plan and the new supply contracts).

In April 2012, the Remote Management System began operating a commercial application for customers, allowing for the remote management of 15,000 customer’s meter readings. This avoided estimated invoicing which, in the case of customers affected by the TUR (last resort tariff), with monthly invoicing and bimestrial real metering, was carried out one out of two invoices.

Moreover, this new system will provide further information on consumption, enabling the optimisation of invoices, and remote changes of capacity and tariffs, thus considerably reducing the time spent on these operations.

In short, this system will lead to a more efficient management, a reduction of operational costs, better customer services, and an improved performance in the continuity of supply.

## What should I know about the Replacement of Meters Campaign?

- By the 31<sup>st</sup> of December 2018, all power supply measurement meters with a contracted capacity of up to 15 kW, will be replaced with new equipment enabling hourly discrimination and remote management.
  - In the case of customer-owned meters; if, under the Plan, the replacement has to be carried out before a period of 15 years following the installation and sealing of the equipment, the replacement will be done at no expense to the owner and will not incur any rental charge for the
- remaining lifespan of the equipment until the 15-year period expires.
  - The effective installation of remote management and measurement systems, as well as the integration of measurement equipment in these systems, shall be performed within a period expiring on the 1st of January 2014.
  - HC ENERGÍA’s Official Technical Service will perform the meter replacement works on the dates shown on information signs that will be displayed
- in prominent areas of buildings, and will only apply to consumers who have previously been informed by HC ENERGÍA by post.
  - This replacement work is free of charge, and HC ENERGÍA will continue to offer the new equipment to customers on a rental basis. The fee established for this service is currently € 0.81/month (See Appendix II: ITC ORDER/3860/2007).

## Electric vehicles

HC ENERGÍA develops its strategy of boosting electric vehicles adhering to the guidelines established by the Government. We have developed our own charging solutions for electric vehicles (CAR-e and PARK-e); we have started installing charge points at our facilities and in public places, in co-operation with local governments; we take part in forums and projects; and we have signed agreements with several electric vehicle manufacturers.

### *LivingCar Project*

This project aimed at creating an experimental platform for electric vehicles, which allowed us to obtain information and draw conclusions from collected data about the performance of this mode of transport in real conditions of use.

The project, which finished in 2011, enabled us to enhance our understanding of the performance of electric vehicles under normal conditions of use, as well as the infrastructures linked to them (charge points, electrical facilities, networks, and onboard technical solutions), and the final users.

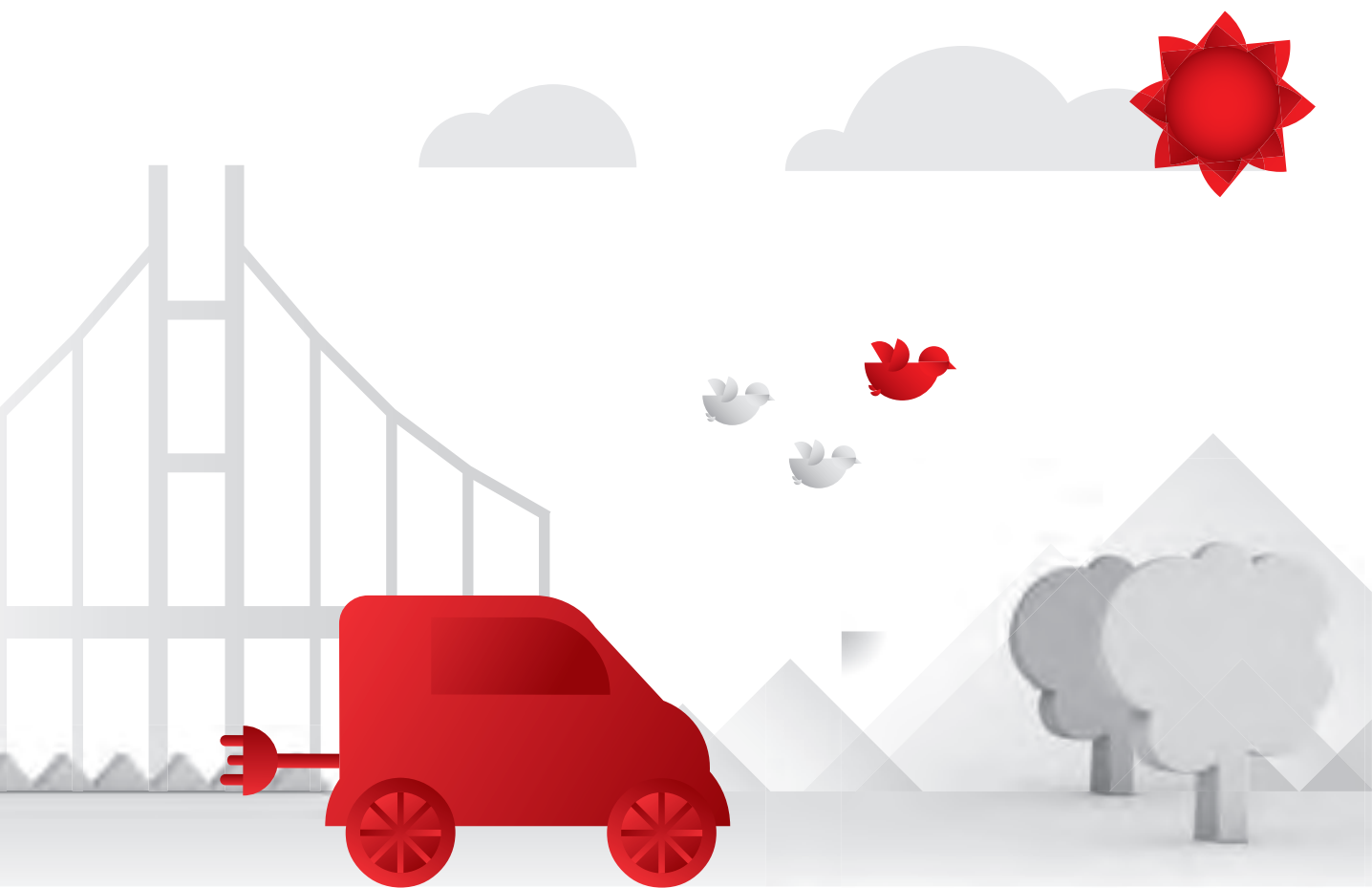


## Agreements with electrical vehicle manufacturers

HC ENERGÍA has signed agreements with TOYOTA, MITSUBISHI and BYD to jointly boost the electrical vehicle market in Spain and to commercialise integrated vehicle solutions and power supplies to charge these vehicles. These agreements will also allow HC ENERGÍA to acquire first-hand knowledge regarding the various technologies applied to battery management systems by each manufacturer.

## Spanish Electric Vehicle Forum (FOREVE)

In 2011, HC ENERGÍA joined forces with FOREVE, the Spanish Electric Vehicle Forum which was created in 2009, with the intention of providing a platform for thoughts and actions that brought private companies and interested entities together to promote the development of electric vehicles in Spain (their manufacture, use, and efficient energy performance), sharing the idea that electric propulsion constitutes an industrial, technological, energetic and environmental opportunity for Spain.



# Multi-year information

**120   Technical Data**

**122   Environmental Data**



\* Joaquín Vaquero Palacios.  
*Wall painting representing an open-air channel  
on the engine room ceiling.*  
TANES HYDRAULIC POWER PLANT.

Technical Data

INSTALLED GENERATING CAPACITY (GROSS MW)	2011	2010	2009
Situation as on the 31 <sup>st</sup> of December 2011			
Total Hydraulic	433	433	433
Conventional Thermal	1,535	1,535	1,535
Natural Gas	1,721	1,721	1,287
Nuclear (15.5% Trillo)	166	166	166
Total Thermal	3,422	3,422	2,989
Overall Total	3,855	3,855	3,421
Wind (1) (15.5% of EDP Renewables' operational capacity)	1,160	1,035	864
Operational MW in Spain (15.5%)	341	318	288
Cogeneration (2)	57	56	63
Biomass	3	3	5
Waste	83	83	82
Special Total	1,302	1,177	1,014
Total	5,157	5,032	4,435
(1) Investments in wind energy generation are made through EDP Renewables. (2) In 2011, Cogeneración Tudela began operation and Montjuic power plant was sold.			

NET POWER GENERATION (MWh)	2011	2010	2009
Total Hydraulic	584,032	1,037,903	877,457
Conventional Thermal	5,353,702	4,243,606	5,864,732
Natural Gas	2,754,049	4,469,828	3,491,021
Nuclear	1,212,044	1,190,117	1,113,027
Total Thermal	9,319,795	9,903,551	10,468,780
Overall Total	9,903,827	10,941,454	11,346,237
Wind (2) (15.5% of EDP Renewables' operational capacity)	2,604,000	2,224,560	1,690,430
Wind energy MW generated in Spain (15.5%)	710,520	675,025	507,625
Cogeneration	300,024	356,203	250,962
Biomass (2)	0	0	6,231
Waste	540,882	553,335	519,531
Special Total	3,444,906	3,134,098	2,467,155
Total Generation	13,348,733	14,075,552	13,813,392
(1) Investments in wind energy generation are made through EDP Renewables. (2) In 2010, no electricity was generated in biomass power plants. Net Electricity Generation= gross electricity generation – plant self-supply.			

ELECTRICAL DISTRIBUTION FACILITIES	2011	2010	2009
Km of Aerial HV Lines (50/132 kV)	1,263	1,396	1,382
Km of Aerial MV Lines (5/10/16/20/22/24 kV)	4,710	4,694	4,585
Km of Underground HV Lines (50/132 kV)	30.91	28	27.3
Km of Underground MV Lines (5/10/16/20/22/24 kV)	1,513	1,466	1,299
Km of Aerial LV Networks	12,240	12,222	12,028
Km of Underground LV Networks	2,796	2,754	2,552
Transformation Centres (no.)	6,686	6,519	6,464
Installed Capacity of Transformation Centres (MVA)	2,222	2,178	2,094
Substations (no.)	56	56	49
Transformers in Substations (no.)	101	98	102
Installed Capacity of Substations (MVA)	4,423	4,886	4,997
In 2010, assets from new utility companies were added: Fevasa, Electra de llobregat, IERI and Solanar.			

# Customers and Energy

ELECTRICAL DISTRIBUTION	2011	2010	2009
Supply Points	656,119	651,001	644,524
Low Voltage (<1 kV)	655,004	649,895	643,473
Medium Voltage (>1 kV and < 36 kV)	1,091	1,085	1,030
High Voltage (> 36 kV)	24	21	21
Distributed Energy (GWh)	9,516	9,363	9,130
Low Voltage (<1 kV)	2,422	2,689	2,594
Medium Voltage (>1 kV and < 36 kV)	1,282	1,273	1,214
High Voltage (> 36 kV)	5,812	5,401	5,322
COMMERCIALISATION OF ELECTRICITY	2011	2010	2009
Supply Points	717,686	667,712	536,323
HC ENERGÍA	385,385	330,707	233,089
B2B (key accounts and businesses)	14,944	14,435	11,600
B2C (domestic and small businesses)	370,441	316,272	221,489
NATURGAS ENERGÍA	106,472	102,838	70,734
B2B (key accounts and businesses)	2,937	2,531	1,033
B2C (domestic and small businesses)	103,535	100,307	69,701
CHC ENERGÍA (50%)			
Supplies	225,829	234,167	232,500
Commercialised Energy (GWh)	20,591	20,532	15,504
HC ENERGÍA	15,836	16,184	12,393
B2B (key accounts and businesses)	14,571	15,069	11746
B2C (domestic and small businesses)	1,265	1,115	647
NATURGAS ENERGÍA	1,995	2,030	1,695
B2B (key accounts and businesses)	1,667	1,718	1,521
B2C (domestic and small businesses)	328	312	174
CHC ENERGÍA (50%)			
Energy	746	792	365
HC LAST RESORT			
Energy	833	1,099	614
Other commercial activities			
Energy	1,181	427	437
B2B: Customers with an annual consumption of over 200 MWh. B2C: Customers with an annual consumption of below 200 MWh.			

# Market Shares

CUOTA DE MERCADO	2011	2010	2009
Generation (%)	6.0	6.1	6.2
Distribution (%)	3.8	4.0	4.0
Commercialisation (%)	12.1	12.1	11.3

Environmental Data

Specific Emissions per Power Plant

	2011		2010		2009	
	kt	kg/MWh	kt	kg/MWh	kt	kg/MWh
SO <sub>2</sub>						
Coal Thermal Power Plant						
• Aboño	4.77	1.16	4.44	1.31	5.83	1.24
• Soto de Ribera	1.53	1.25	1.67	1.97	3.07	2.20
Cogeneration						
• Sidergas	0.09	0.14	0.09	0.16	0.04	nd
NO <sub>x</sub>						
Coal Thermal Power Plant						
• Aboño	6.47	1.56	4.65	1.37	8.13	1.72
• Soto de Ribera	2.18	1.79	1.99	2.35	3.21	2.29
Cogeneration						
• Sidergas	0.37	0.59	0.45	0.75	0.39	nd
Combined-Cycle						
• Soto de Ribera CCGT	0.10	0.06	0.10	0.07	0.05	0.05
• Castejón CCGT	0.14	0.14	0.31	0.11	0.09	0.09
Particulates						
Coal Thermal Power Plant						
• Aboño	0.22	0.05	0.21	0.06	0.28	0.06
• Soto de Ribera	0.05	0.04	0.09	0.11	0.23	0.16

	kt	t/MWh	kt	t/MWh	kt	t/MWh
CO <sub>2</sub>						
Coal Thermal Power Plant						
• Aboño	5,543.40	1.34	4,621.66	1.36	5,718.88	1.17
• Soto de Ribera	1,217.78	1.00	884.42	1.04	1,318.34	0.93
Combined-Cycle						
• Soto de Ribera Combined-Cycle Thermal Power Plant	688.48	0.39	550.68	0.39	800.85	0.39
• Castejón Combined-Cycle Thermal Power Plant	389.64	0.40	1,043.42	0.38	543.89	0.37
Cogeneration						
• Sidergas	360.36	0.57	330.70	0.56	271.92	nd
• Bioener	36.06	0.58	39.42	0.59	37.90	nd
• Eito	19.91	0.32	19.37	0.32	24.21	nd
• Oviedo's Hospital	23.95	0.70	30.68	0.48	29.64	nd
• Intever	57.43	0.56	59.39	0.52	63.15	nd
• Sierra de la Tercia	67.73	0.53	67.30	0.53	65.31	nd
• Sinova	61.77	0.54	62.03	0.54	57.58	nd
• Tudela	17.44	0.30	-	-	-	-
COMMENTS: Specific emissions have been calculated with all decimal points. SO <sub>2</sub> , NO <sub>x</sub> , and particulate emissions are measured using continuous measurement systems in thermal power plants and combined-cycle power plants. This is not the case for cogeneration power plants, where emissions are one-off measured. CO <sub>2</sub> emissions are calculated in accordance with Decision 2007/589. In 2011, specific emissions in cogeneration power plants were measured taking into account not only electrical power, but also thermal power.						



## Consumption

FUEL CONSUMPTION (terajoules)	2011	2010	2009
Total Fuel Oil	163.7	170.1	206.0
Total Natural Gas	27,419.4	37,832.5	33,690.6
Total Coal	48,257.7	37,609.2	53,148.9
Total Gasoil	124.2	98.9	96.6
Total Blast Furnace Gas	9,469.8	8,222.6	8,055.5
Total Coke Oven Gas	1,506.7	1,508.9	1,663.7
Total Basic Oxygen Furnace Gas	1,668.3	1,531.0	1,148.2
Comments: The higher heating value (HHV) of each fuel has been used for the calculations. All cogeneration plants subject to an EU-ETS are included.			

WATER CONSUMPTION	2011	2010	2009
Water Abstraction (excluding cooling water)	2,390,639	2,622,655	2,784,736
• River (m³)	541,552	625,531	569,174
• Local water network (m³)	1,849,087	1,830,105	2,172,783
• Well (m³)	0	167,019	42,779
Water Abstraction For Cooling	437,482,214	357,258,827	455,020,845
• River (m³)	7,915,629	10,409,893	14,163,387
• Sea (m³)	429,458,353	346,622,290	440,408,776
• Well (m³)	0	133,665	298,072
• Local water network (m³)	108,232	92,979	150,610
Water Consumption in Electricity Generation (m³/year)	2,267,464	2,588,372	2,564,189
Specific Consumption of Water for Cooling (net m³/GWh)	49,351	37,573	45,744
Specific Water Consumption for Electricity Generation (net m³/GWh)	256	272	273
Recycled water is not used. In 2011, the water consumption in ISO 14,001 certified cogeneration power plants was included. The water used by these types of power plants does not generate electricity. Instead, it is used to create the steam requested by our partner. Note: In 2011, specific consumption levels were re-calculated so as to take into consideration the thermal energy delivered to the partner in the cogeneration plants.			

## Waste Management

WASTE MANAGEMENT (tons)	2011	2010	2009
Total Hazardous Waste Managed	483	533	1018
• Total Eliminated PCB's	60	141	314.00
Total Non-hazardous Waste Managed	85,636	231,947	332,148
Valorised Waste and By-Products			
• Valorised Flying Ashes	291,741	146,932	246,760
• Valorised Bottom Ashes	59,553	82,410	39,407
• Valorised Gypsum	42,410	41,947	
Total Waste and By-Products Valorised	393,703	271,460	287,889
% Valorised Waste and By-Products	82%	99%	86%
Most hazardous waste includes oils, contaminated cloths, mud from the chemical cleaning of boilers and PCB-contaminated transformers. Oil is incinerated with heat recovery or regenerated; PCB-contaminated transformers are incinerated to recover copper; and the remaining hazardous waste is taken to a security dump. Almost all non-hazardous waste consists of flying and bottom ashes, scraps and sludge from water clarification; gypsum constitutes a by-product. Flying and bottom ashes, gypsum and scrap metals are sold and recovered in other processes (cement and concrete, iron steel and construction industries).			

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