# 6 The Environment and Renewable Energies Sector

The eco-industry sector generated a business turnover of 227,000 million euros in Europe in 2004 (EU25), according to the latest information published by the European Commission.

In addition to the traditional activities associated with the environment, the renewable energies sector, one of growing importance throughout the world, has also been included.

The industry accounts for 2.2% of the GDP of the EU25, with Spain representing 4% of the European overall total, with a total turnover of 9,044 million euros.

The distribution of environmental sectors in Spain is similar to that existing in other European countries, strongly biased towards water supply and waste treatment.

Spanish environment market (million euros)

Source: European Commission – Ecoindustry 2006. 2004 Data

Environment Sectors in Spain (million euros)

| Sub-sector | Value |
|---|---|
| Solid Waste Treatment | 2,244 |
| Sewage Treatment | 1,985 |
| Air Pollution Control | 974 |
| Public Management | 201 |
| Private Environmental Management | 225 |
| Repair of Contaminated Ground | 207 |
| Vibration and Noise Control | 108 |
| Environmental R&D | 104 |
| Environmental Supervision and Instrumentation | na |
| Water Supply | 2,195 |
| Recycling | 719 |
| Renewable Energy Production | 47 |
| Nature Protection | 36 |
| Eco-Construction | na |
| TOTAL | 9,091 |

Source: European Commission – Ecoindustry 2006. 2004 Data

In renewable energies, Spain occupies a world-leading position in the fields of wind and solar energy.

Country Ranking in Renewable Energies

| Top 5 Countries | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| **Capacity added in 2005** | | | | | |
| Annual Investment | Germany/China | | USA | Japan | Spain |
| Wind Energy | USA | Germany | Spain | India | China |
| Photovoltaic Solar | Germany | Japan | USA | Spain | France |
| Thermal Solar | China | Turkey | Germany | India | Several |
| Ethanol | Brazil/USA | | China | Spain/India | |
| Biodiesel | Germany | France | Italy | USA | Czech Rep |
| **Capacity existing in 2005** | | | | | |
| Capacity in Renewable | China | Germany | USA | Spain | India |
| Large Hydro. | USA | China | Brazil | Canada | Japan/Russia |
| Mini-hydraulic | China | Japan | USA | Italy | Brazil |
| Wind Energy | Germany | Spain | USA | India | Denmark |
| Biomass | USA | Brazil | Philippines | Several | |
| Geothermal | USA | Philippines | Mexico | Indonesia/Italy | |
| Photovoltaic Solar | Germany | Japan | USA | Spain | Holland |
| Thermal Solar | China | Turkey | Japan | Germany | Israel |

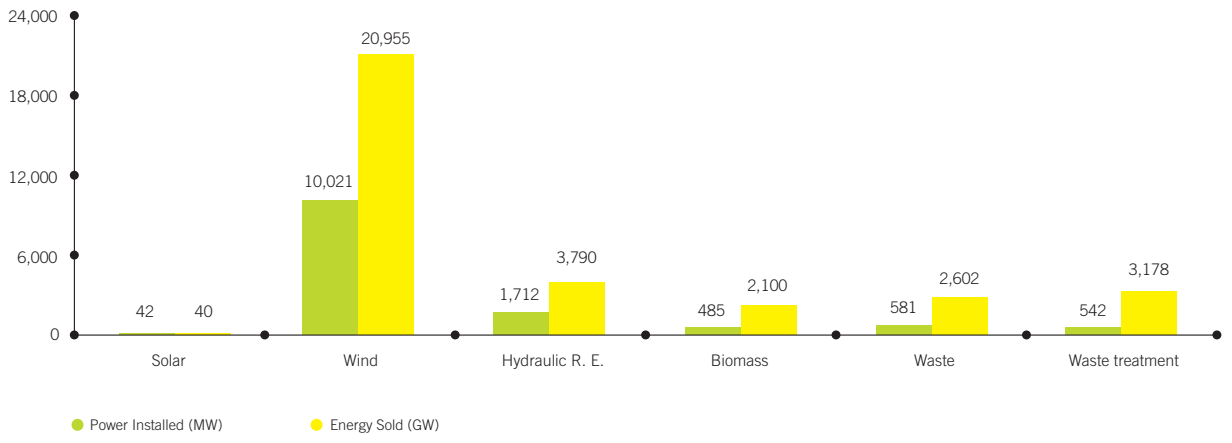
Source: Ren21 - 2006.

Spain's prominent position in wind energy is enabling it to be one of the few countries on the road to complying with the EU target of obtaining 12% of its total energy consumption from renewable sources.

Spain lies second in the world in this type of production.

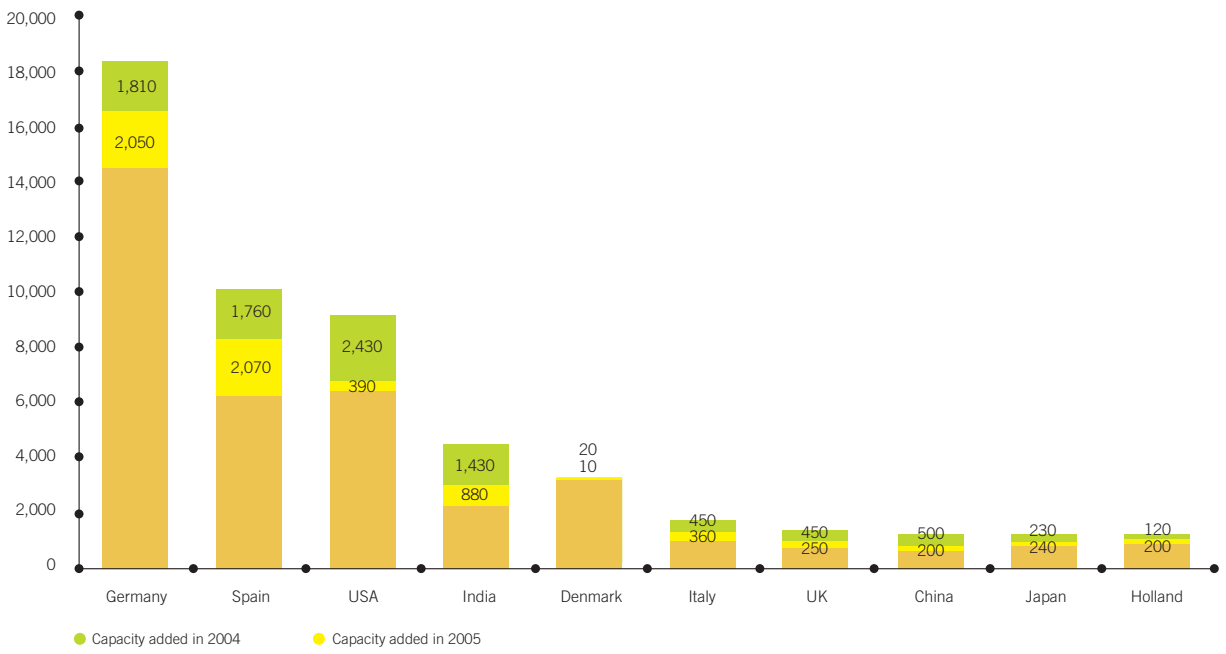
The industrial aspect is also significant in Spain, which is home to the third largest company in the world in wind energy equipment and the top European company in photovoltaic panel production.

Renewable energies in Spain in 2005 (power installed [MW] and energy sold under special system [GW])




Report on the Sales of Energy under Special Supply Arrangements in Spain. Year 2005
Large Hydro. not included

Country Wind Power Ranking (capacity 2005, MW)




Source: Ren21 – 2006

# The Sector in Cantabria
## environment

Cantabria possesses an advanced environmental management model, based on the Cantabria Waste Plan, for 2006-2010, which in turn is the first step towards drawing up Sector Plans.

The region's Government has also created two entities responsible for the environment, in both management and monitoring aspects; MARE and CIMA.

### ENVIRONMENT, WATER, WASTE AND ENERGY OF CANTABRIA

This is a public company belonging to the Government of Cantabria, which under the Environment Department performs the following activities:

- High capacity water supply activities.
- High capacity urban sewage processing and treatment.
- Management of urban and industrial waste.
- Maintenance and rehabilitation processes in regional territory.
- Energy production deriving from exploitation of the above activities and alternative energies in general.

www.medioambientecantabria.com/ercsa

### ENVIRONMENTAL RESEARCH CENTRE (CIMA)

This is an autonomous body of the Government of Cantabria, dependent on the Environment Department, whose activities focus on performing physical and chemical analyses concerning the state of the environment.

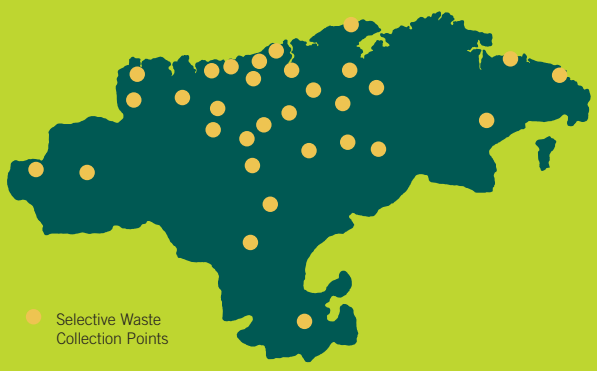
www.medioambientecantabria.com/cima

The Campoo-Los Valles Energy Ecofarm is an innovative project in which experiments will be undertaken with energy sources that will assure a more sustainable future, i.e. alternative energies. The Ecofarm will enable research into the use of new energies and develop industrial facilities that increase the region's self-sufficiency. It will foster an efficient and responsible use of our resources.

www.ecoparqueenergeticocampoolosvalles.com

The Waste Plan is necessary because of the high volume of waste produced by the region's industry and population in general.

In order to fulfil the region's first plans, a series of infrastructures were created that are currently being extended, including selective waste collection points available to any citizen.



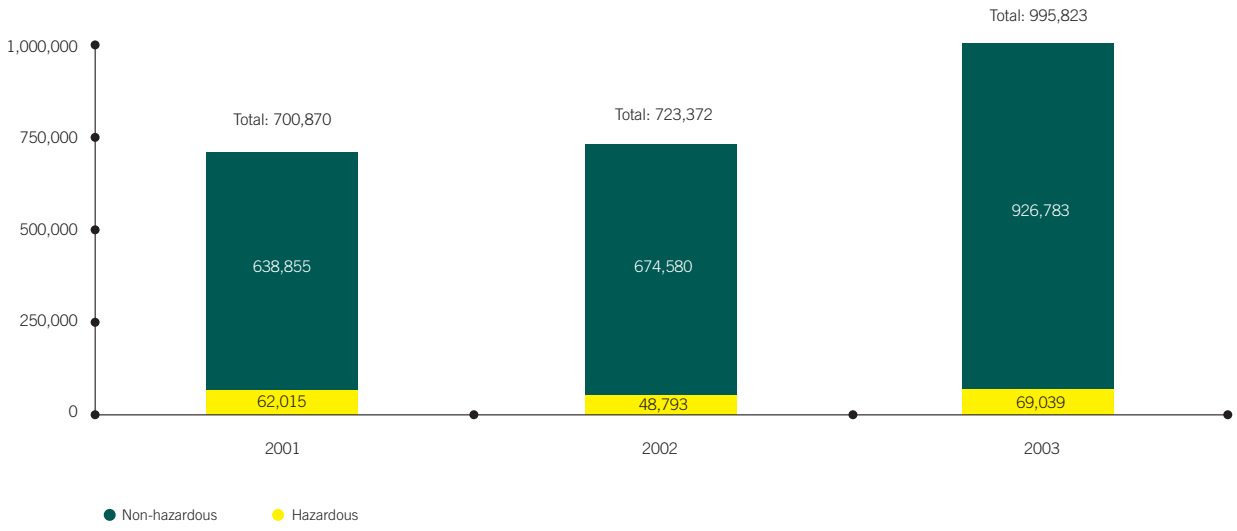

Likewise, the current plan has laid down 13 targets that generate new business opportunities for new installations.

These targets include the following main lines of action:

- Prevention.
- Reuse.
- Recycling
- Energy exploitation.
- Minimization of industry waste.
- Inventory of contaminated land.
- Creation of a landfill network.

The need to support the various environmental activities has led to the entry of large groups dealing with waste management, water, etc. as well as the development of specialised local companies.

Waste in Cantabria (tm)




Source: Cantabria Waste Plan 2006 - 2010

## LEADING COMPANIES FROM THE SECTOR IN CANTABRIA

### Ascan-Sadisa

Turnover: 170 €M
Employees: 1,271
SANTANDER

The main environmental services group in Cantabria, strong in the field of urban waste management.

### MARE

Turnover: 13 €M
Employees: 332
SANTANDER

This public company created by the Government of Cantabria has achieved significant turnover figures mainly due to services rendered to municipal corporations.

### Urbaser

Turnover: 12 €M
Employees: 184
MERUELO

Urbaser belongs to the ACS group and is the main operator in the environment sector in Spain.

### Lunagua

Turnover: 10 €M
Employees: 54
EL ASTILLERO

Lunagua offers treatment and management services for special waste and is also a transfer centre, being one of the largest Spanish operators.

Turnover in millions of euro.
Unless otherwise indicated the data refers to 2005 and activity or business centre in Cantabria.

# The Sector in Cantabria
## renewable energies

Primary energy consumption in Cantabria in 2004 was 1.91 MTPE. This figure represents a per capita consumption 5.5% above the average for the rest of Spain due to the high intensity of electricity consumption by the region's industry.

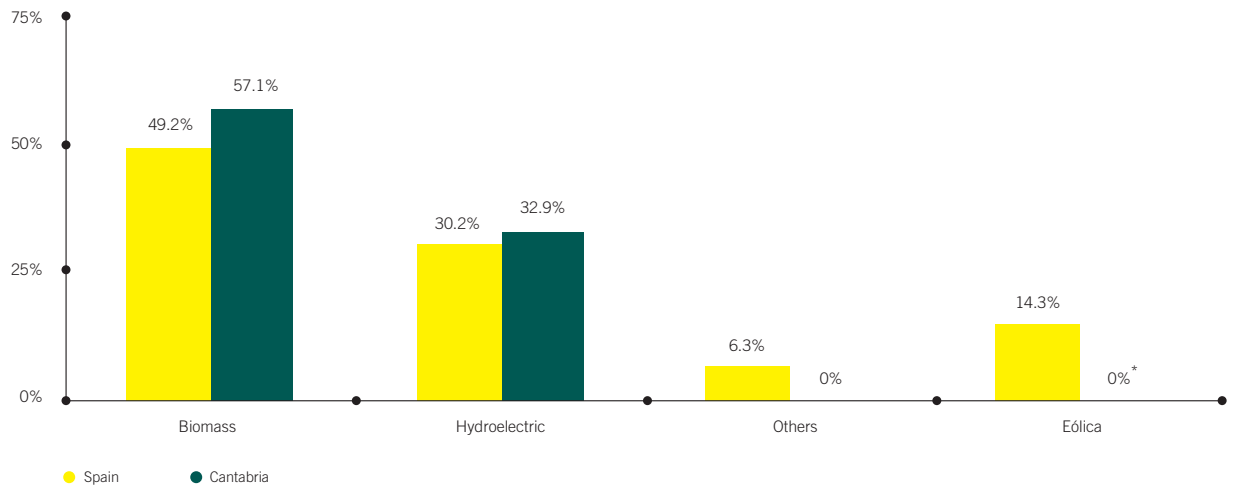
The Government of Cantabria wants to increase the regional level of electricity production through the application of its Energy Plan 2005-2011, increasing the use of renewable energies and generation based on natural gas consumption.

Although Spain generates 100% of the primary energy it consumes, its supply sources are from outside, with a level of self-sufficiency of just 19.3%, achieved thanks to consumption of domestic coal, renewable energies and nuclear energy.

The regional level of self-sufficiency in primary energy lies at 4.1% of its overall consumption. This is equivalent to 79.2 ktpe, which in practice is wholly achieved thanks to renewable energy supplies, as Cantabria has neither coal nor nuclear energy.

Biomass is currently the main source of renewable energy (generally for end consumption by its producer), although plans have been drawn up to develop other sources.

Spread of renewable energy production (2004)




Source: Government of Cantabria. Cantabria Energy Plan 2005 - 2011

* Several wind farms are planned for the region.

The Government of Cantabria's overall demand forecast adopts two scenarios: a trend following the current pattern, or another scenario using various energy-savings policies to achieve a lower growth rate and a final figure that is 7.7% lower.

Renewable energy sources play an important role, both for electricity production and in biofuels.

In fact, the forecast is that renewable energies will come to account for 8.9% of energy consumption, a much higher level than would have been achieved following the trend prior to the Strategic Plan, satisfying 19.7% of the region's electricity demand.

IMAGEN: CANTAREY

Predicted evolution of total demand in Cantabria (kTEP)

Source: Government of Cantabria. Cantabria Energy Plan 2005 - 2011

One of the factors that will facilitate the execution of the Energy Plan is the existence of a public company, the *Sociedad de Gestión Energética de Cantabria* –GENERCAN (The Energy Management Company for Cantabria) to monitor and promote the Summary of renewableenergy targets under the saving.

GENERCAN
sociedad de gestión energética de cantabria

Quantitatively, the Energy Plan aims to raise the volume of energy from renewable sources from its current 79 ktpe to 208 ktpe in the year 2011.

Various actions laid out in the plan scenario

| | Thermi Solar | Photovoltaic | Wind | Biomass | Hydroelectric |
|---|---|---|---|---|---|
| Current Situation | | | | | |
| | 1,000 m² | 100 kWp | 0 MW | 53 kTep | 100 MW |
| Saving Situation 2011 | | | | | |
| | 20.856 m² | 4,7 MWp | 300 MW | | 109 MW |
| | 1,517 Tep | 440 Tep | 72 kTep | 104 kTep | 30 kTep |
| Increase in Share | | | | | |
| | 1.986% | 4.600% | – | 100% | 11.5% |
| % Consumption renewable energies in 2011 | | | | | |
| | 0.9% | | 34.5% | 50.2% | 14.4% |

## AIMS OF THE CANTABRIA ENERGY PLAN 2005-2011

| Scope | Aim | Measures |
|---|---|---|
| Primary Energy | To obtain an energy saving over the consumption trend in the primary energy forecast at 7.7% in the year 2011. | • Fostering cogeneration.<br>• Fostering the replacement of liquid fuels with natural gas. |
| Final Energy | To obtain an energy saving over the consumption trend in final energy of 2.6% in the year 2011. | • Household Sector: Measures to improve household efficiency in buildings.<br>• Services Sector: Measures to improve energy efficiency in buildings.<br>• Industrial Sector: Improvement of industrial energy efficiency.<br>• Transport Sector: Energy diversification and efficiency. |
| Renewable Energy | For these energy sources to account for 8.9% of primary energy in the year 2011 and to cover 19.7% of electricity demand. | • Enhancement of the following renewable energy modes:<br>– Minihydroelectric.<br>– Wind.<br>– Solar (thermal and photovoltaic).<br>– Biomass.<br>– Reduction of GHG emissions. |
| Reduction of GHG emissions | Reduction of $CO_2$ Emissions estimated at 3.0 Mt/$CO_2$ for the entire period comprising the Plan (2005-2011). | • This aim is a consequence of those above. |

The Energy Plan has specific plans for wind energy, identifying profitable exploitation areas which also respect the values of the region's landscape.

Map showing development areas for wind farms

Biofuels are also key players in the regional energy plan, with projects that are going to lead national biodiesel and bioethanol production.

Given that an increase in the use of biofuels also depends on consumer participation, the Government of Cantabria has designed the *"PROGRAMACEROCO2"* (Programme zero CO2) plan in order to encourage the use of biofuels through educational activities and publicising the list of petrol stations that supply these fuels.

Cantabria's coastal location has also enabled it to innovate in the field of tidal and wave energy, with a series of experiments led by the University of Cantabria, producing prototypes that aim to revolutionise the renewable energy market. The *Instituto de Hidráulica Ambiental* (IH Cantabria) (The Environmental Hydraulic Institute), with over 60 researchers and specialists in this field, coming together in the Oceanographic and Coastal Engineering Group and the Deep Sea Emissaries and Environmental Hydraulics Group, offer a state-of-the-art development capacity.

Likewise, the Cantabrian coast is going to house one of the first wave energy farms in the world with a supply capacity of 1.25 MW.

Electricity production buoy

Cantabrian industry includes some important companies in the renewable energies sector, both in equipment and in production.

## LEADING COMPANIES IN THE SECTOR IN CANTABRIA

### Cantarey-Gamesa

Turnover: 43 €M
Employees: 272
REINOSA

- Belonging to the Gamesa Group, Cantarey manufactures electrical machinery for wind generators.
- Its equipment is fitted at wind farms throughout the world.

### Industrias Hergóm

Turnover: 40 €M
Employees: 220
SANTANDER

- Hergóm is the leader in Spain and one of the world's most important manufacturers of household heating appliances, mainly heaters and fireplaces that burn biomass.

### Saltos del Nansa

Turnover: 20 €M
Employees: 17
SANTANDER

- This Endesa subsidiary manages several hydroelectric plants in the River Nansa basin, with an average yearly production of 165-170 million kilowatt-hours.

### Sniace Biofuels

Turnover: na
Employees: na
TORRELAVEGA

- The Sniace Biofuels plant in Torrelavega is going to become one of Spain's most important bioethanol suppliers with an expected production of 100,000 t/year.

### Gebiosa

Turnover: na
Employees: na
PONTEJOS

- This company's experience in the field of vegetable oils is enabling it to lead one of the main biodiesel production projects in Spain.

Turnover in millions of euro.
Unless otherwise indicated the data refers to 2005 and activity or business centre in Cantabria.

# THE CANTABRIA INSTITUTE OF Environmental Hydraulics

The Institute of Environmental Hydraulics (IH Cantabria) is dedicated to the research and development of methodologies and tools for managing aquatic ecosystems.

IH Cantabria is going to strengthen the capacities already existing in the region, largely at the University, to offer:

- Research.
- Professional education and training.
- Technological development, innovation and consultancy for public authorities and enterprises.

Hence, the current team of 60 researchers and technicians is expected to rise considerably in coming years to a figure of approximately 200.

## Fundamental Lines of Activity

- The mechanics of environmental flows and turbulent processes and shipping in aquatic environments.
- Oceanography of the coastal areas, analysis of the geophysical and hydrological variables.
- Analysis of the risk of flooding, tsunamis and climate change effects.
- Fresh water and seawater quality and pollution. Coast, port and river engineering, design of waste disposal systems, hydraulic engineering.
- Computational hydraulics, physical modelling, measurement and remote sensing systems.
- Renewable energies linked to the marine environment.

Cantabria's large marine engineering tank will be one of the most sizeable in the world. Measuring 45x35x3 metres, and with a central trench measuring 10 metres, it is one of the most important research tools the Institute of Environmental Hydraulics possesses.

Located in the Cantabria Science and Technology Park, this scientific and technological facility will be able to simulate multidirectional wave situations, currents, wind and other phenomena such as tsunamis.

The tank, which has coastal and off-shore applications, is going to require an investment of 16 million euros. It will be financed by the Government of Cantabria and the Ministry of Education and Science.

IH cantabria
INSTITUTO DE HIDRÁULICA AMBIENTAL