



05

Environmental Report



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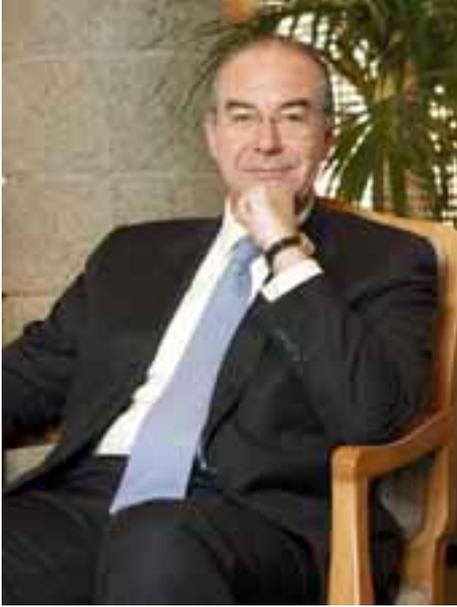
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[Letter from the Chairman



Environmental protection is key to all our business decisions, as the sector in which we operate demands both a constant balance between natural resources and requirements, and a determined responsibility on behalf of current and future generations. In this spirit, at Enagás we aim to reconcile industrial and economic processes with a respect for the environment, contributing in this way to sustainable development.

2005 was characterised by two important milestones. The first of these was the inauguration of the greenhouse gas emission trading scheme, in which Enagás obtained emission rights for all Company facilities subject to the scheme. Secondly, the year was marked by the approval of the third environmental strategic plan for the 2005-2010 period, a plan which will continue to view environmental protection as one of its main priorities.

At Enagás we are committed to reducing greenhouse gas emission levels, offering all users, as efficiently as possible, the least contaminating types of fossil fuels. In addition, we continually invest in technology that will reduce our own emission levels, thus improving the energy efficiency of our processes.

For the fourth year running, Enagás has published its Environmental Report, making public all those Company actions relating to this area, and reaffirming our commitment to protecting our natural surroundings.

I would like to conclude by highlighting the excellent work carried out by all our employees, as well as all of those who collaborate with Enagás. With this help, we can maintain our position as a leading company in the area of environmental protection.

Antonio González-Adalid
Chairman

A handwritten signature in blue ink, which appears to read "Antonio González-Adalid".





The Enagas
Group

The Enagas Group

The Enagas Group

Nowadays, Enagas is the principal gas transportation company in Spain. Also, and according to Royal Decree-Law 6/2000, Enagas was designated as System Technical Manager of the Gas System. It's primary objectives as Technical Manager are to guarantee safety and continuity in the natural gas supply, as well as correct coordination amongst the access, storage, transport and distribution points.

Enagas offers third parties access to the network to the distribution companies that operate in the liberalised market and also is in charge of supplying the regulated market.

Enagas has its headquarters in Madrid, where the management bodies can be found, and from where all its activities in the role of transportation and System Technical Manager are coordinated. The Prevention and Environment Unit, assigned to the

Technical Secretariat, is responsible for coordinating all of the Group's environmental issues.

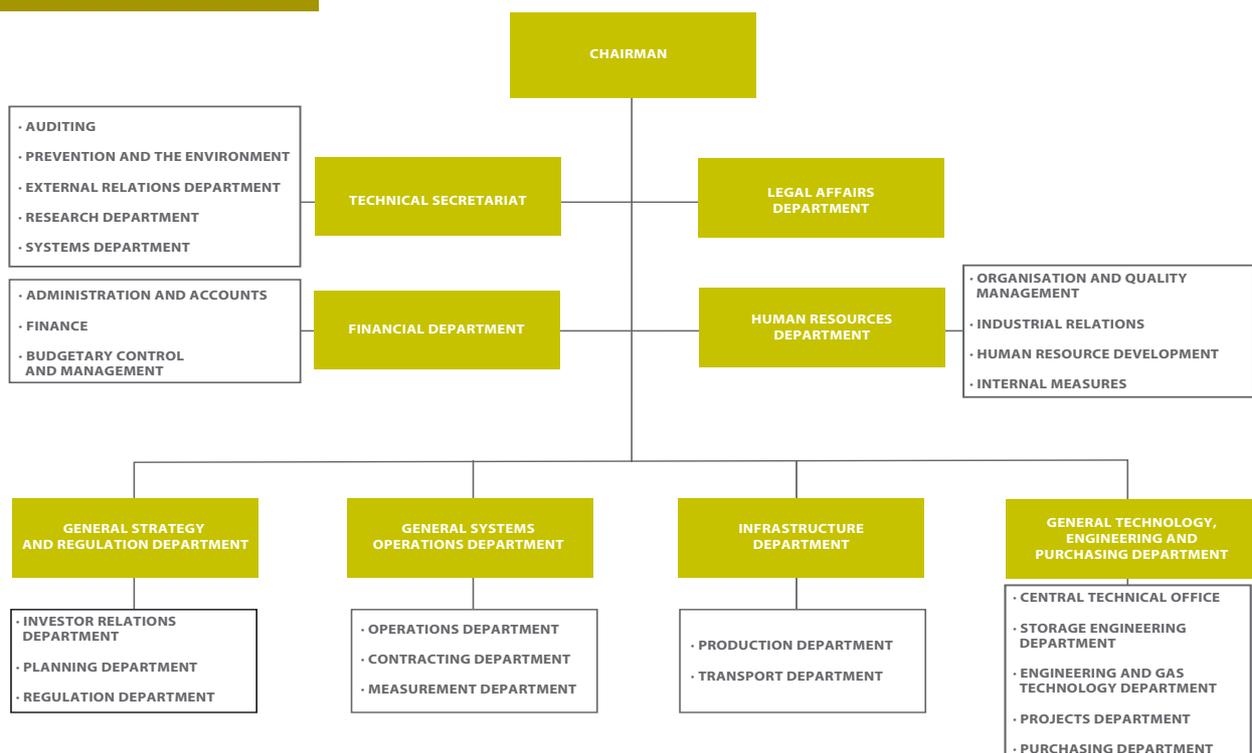
Enagas is constantly improving and widening its infrastructure network. The Group currently has the following facilities:

- Three storage and regasification plants, situated in Barcelona, Cartagena and Huelva, which have been in constant expansion over the last few years, reaching storage capacity

of 987,000 m³ of LNG, and an emission capacity of 3,450,000 m³(n)/h.

- 7,538 km of gas pipeline, operating at high transport pressure.
- 11 compression stations with an installed power of 233.5 MW.
- 325 regulating and measuring stations.
- 29 operations and maintenance centres, where surveillance and maintenance operations for the transport facilities are carried out.

Organisational structure



Spanish gas system



- Underground natural gas storage in Serrablo (Huesca), which guarantees gas storage in times of greatest market demand. It has a

storage capacity of 775 million $m^3(n)$ and a maximum network production of 6.8 million $m^3(n)/day$.

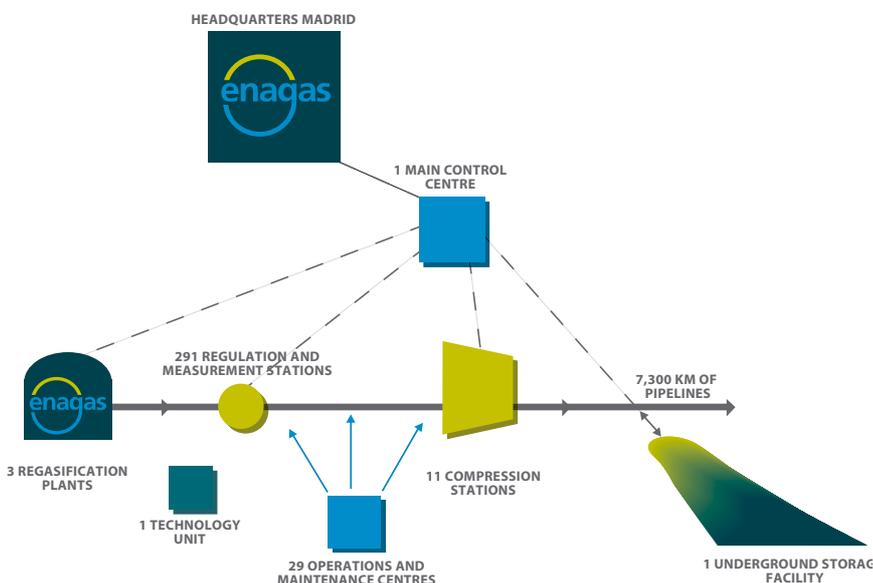
- The Technology Unit, situated in Zaragoza, where research, development and innovation projects are carried out, as well as tests on gas and control equipment, according to the current applicable norms and regulation.

- The Main Control Centre, situated in head offices in Madrid, for the operation, supervision and monitoring of the whole gas system.

The demand for transported natural gas throughout 2005 rose to 376,041 GWh, a 17.6% increase on the previous year's figures.

The majority of the gas transported is imported from other countries in the form of liquid natural gas (LNG), which is introduced into the gas network through the three regasification plants. The remaining gas is added to the system as natural gas (NG), through the Maghreb gas pipeline (entry via Tarifa) and the international connection in Larrau (Navarra).

Simplified facilities plan







Enagas and
sustainable
development

Enagas and sustainable development

Enagas and sustainable development

1. The energy sector and sustainable development

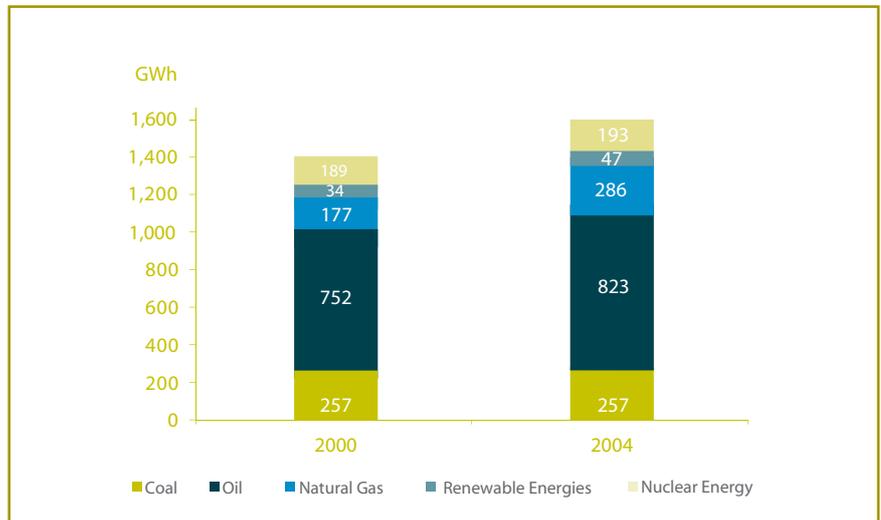
The use of energy sources has a fundamental role to play in the economic development of any society. It is also one of the factors with most influence on the environment, due to the impact of every stage of its life cycle, from extraction until final use.

Current economic development is giving way to an intensification in energy demand, which is making it necessary to encourage the use of more environmentally-respectful energy sources to guarantee sustainable development. In other words, this is energy that harmonises current economic development with that of future generations, and does not cause irreversible alterations to our planet.

Due to this, environmental concerns and all regulation aimed at international environmental protection (in

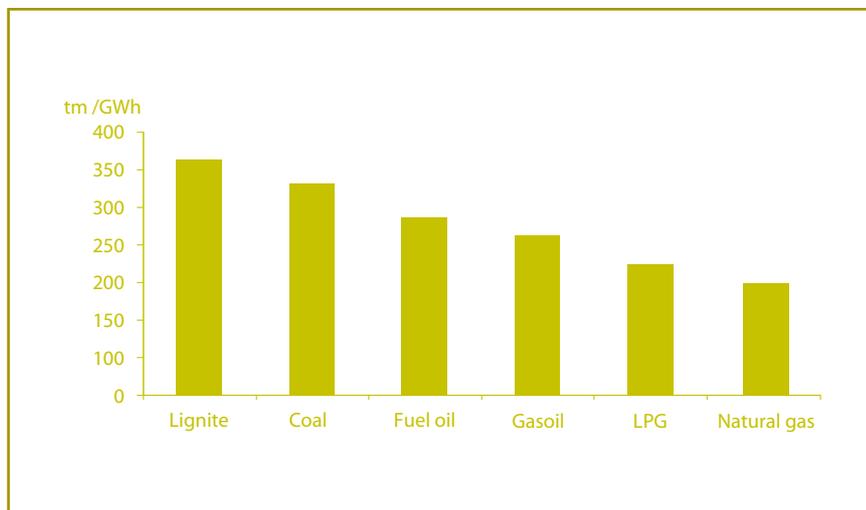
Chart showing primary energy consumption in Spain, 2000 - 2004

Source: General Secretary for Energy. Ministry for Industry, Tourism and Commerce.



CO₂ emission factors

Source: Energy policy options for responding to climate change. Commission of the European Communities 1998



particular those relating to greenhouse gas emission), are having an increasingly important influence on the establishment of energy policies.

Natural gas is the fossil fuel that produces the least environmental impact, from extraction right up until its final use. In addition, given the current rate of consumption its proven reserves guarantee a supply for a period of 60 years, compared to the 40 years offered by oil.

Natural gas is the energy source that is currently used in all consumption sectors, from electricity generation,

through co-generation or combined cycle plants, to heating services in the domestic, commercial and industrial sectors.

The sector in which its consumption is currently increasing the most is in electricity generation, mainly through its use in combined cycle plants which bring together high energy efficiency and a thorough respect for the environment. The high performance of these plants, when compared to their conventional counterparts, leads to reductions of up to 40% in carbon dioxide emissions.

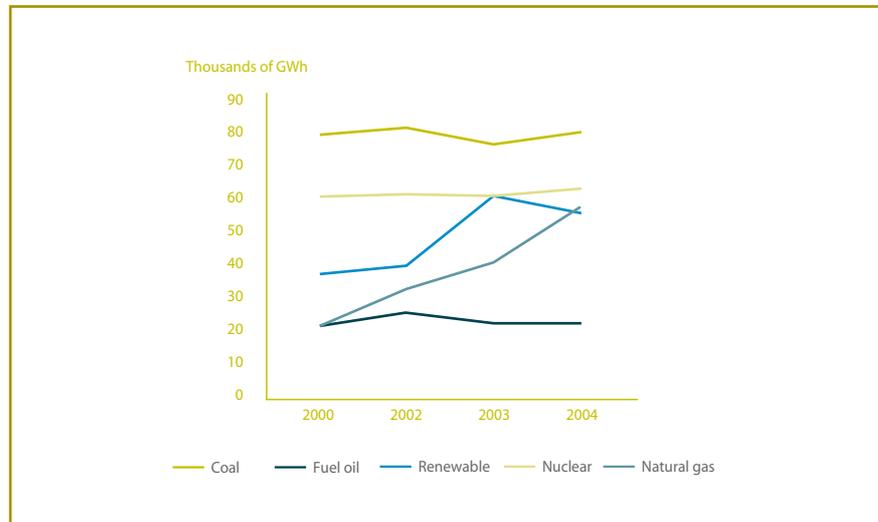
According to the European Union green book *Towards a European Strategy for the Security of Energy Supply*, at the end of the decade combined cycle plants will have to supply around two-thirds of the increase in electrical energy demand. In addition, the green book also points out that almost half of all electricity will be produced by the use of natural gas between 2020 and 2030.

Likewise, according to forecasts by the *Strategy of Saving Energy Efficiency in Spain 2004 – 2012 (E4)*, the demand for natural gas and renewable energies in 2012 will double present figures, to the detriment of coal, and will represent 24% of all primary energy consumption.

This strategy aims to guarantee supply, improve competition through the efficient use of resources and encourage environmental protection. This will lead to an accumulated saving of 813,519 GWh in primary energy between 2004 and

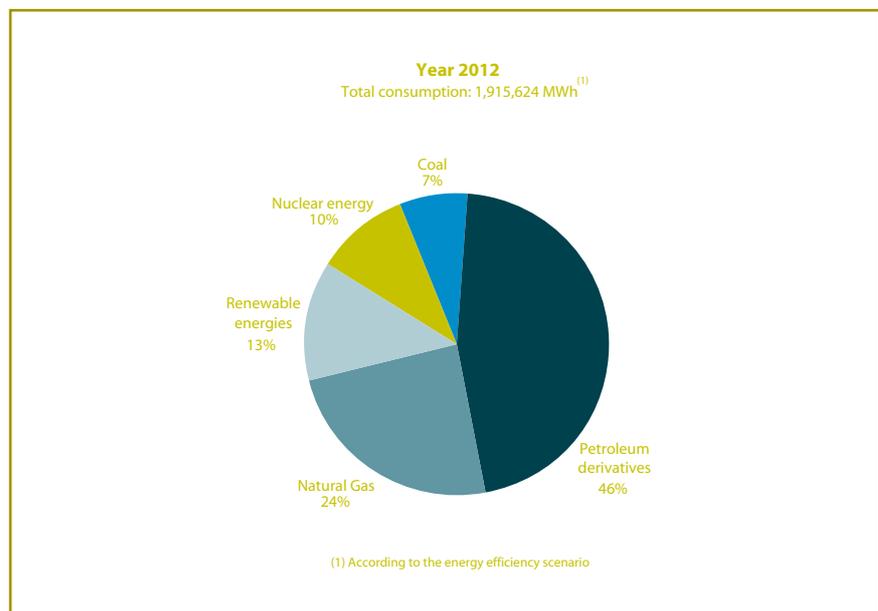
Evolution of electrical energy generation in Spain (2000 – 2004)

Source: General Secretary for Energy. Ministry for Industry, Tourism and Commerce.



Primary energy consumption forecast for Spain, 2012

Source: Strategy of Saving Energy Efficiency in Spain 2004 – 2012 (E4)

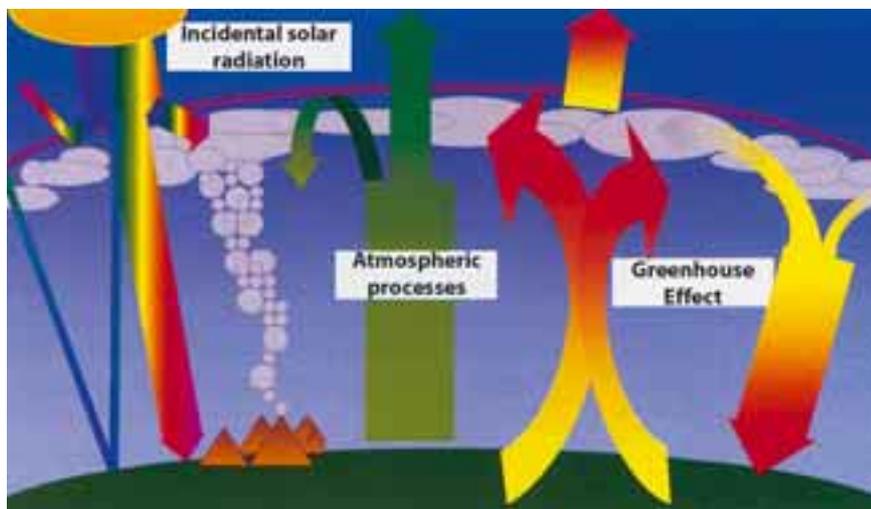


2012, and a decrease in the country's energy intensity rate, which will lead to an annual reduction of 42 million tons of carbon dioxide.

Under these conditions natural gas, due to its composition and effi-

ciency, is being consolidated in Spain as one of the main ways in which to reach established energy saving objectives, becoming the primary energy source with the most growth potential.

The Earth's energy balance



II. Climate change

Statistical and scientific data from recent years shows that the climate of

our planet is changing, due to increased concentration of greenhouse gases in the atmosphere. This increase is fundamentally based on anthropo-

genic causes, and has produced a warming-up of the planet's surface. This phenomenon, known as global warming, is due to the intensification of the greenhouse effect. This refers to the retention of part of the sun's heat reflected by the Earth's surface under a layer of certain gases in the atmosphere. Global warming is one of the main threats faced by the environment, and represents a serious barrier for the economic and social development of future generations.

The international response to global warming has been seen through two specific instruments: the United Nations Framework Convention on Climate Change, which came into effect in 1994, and the Kyoto protocol. The Kyoto Protocol develops the general recommendations of the Con-

Greenhouse gases

Gas	Potential and impact	Main emissions from human activity (*)
Carbon dioxide (CO ₂)	Main cause of global warming	Combustion processes
Methane (CH ₄)	Has more potential for global warming than CO ₂ , but has lower concentration levels in the atmosphere	Fermentation processes in farming activities, rubbish dumping, etc.
Nitrous oxide (N ₂ O)	Found in very low concentration in the atmosphere, although it has high potential for global warming	Combustion process and the fertiliser industry
Fluorine gases: Hydrofluorocarbons (HFC) Perfluorocarbons (PFC) Sulphur tetrafluoride (SF ₆)	Are the highest risk for global warming	Aerosols, coolants, electrical insulators, aluminium production
(*) CO ₂ , CH ₄ and N ₂ O are also generated through natural processes: respiration, volcanoes, oceans, etc.		

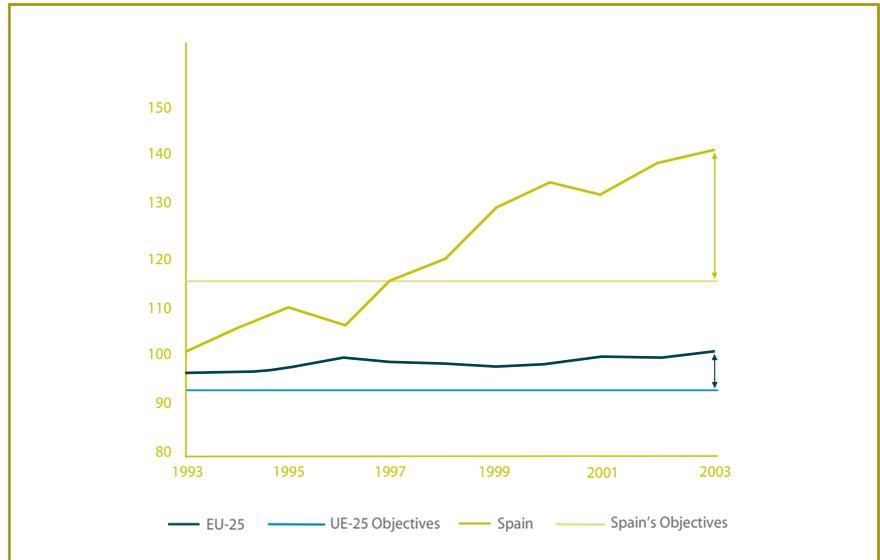
vention and establishes, for the first time, a commitment to reduce the emission of greenhouse gases in developed countries and those with transition economies.

Within the European Union there is the belief that the fight against climate change should not endanger economic development, but rather should, via innovation and the promotion of change in structures and behaviour, lead to more efficient, highly competitive production systems. Because of this, the struggle against climate change has become a priority.

The commitment undertaken by the European Union under the terms of the Kyoto Protocol consists in reducing by 8% its greenhouse gas emissions (based on 1990 figures) between 2008 and 2012. In order to meet this objective, the European Union has undertaken a series of actions which include, from 2005, the esta-

Evolution of annual emissions in Spain and the 25-state EU

Source: Eurostat. Based on 1990



blishment of a community greenhouse gas emission trading scheme. This scheme aims to meet the established commitments with the least possible threat to economic development and the employment situa-

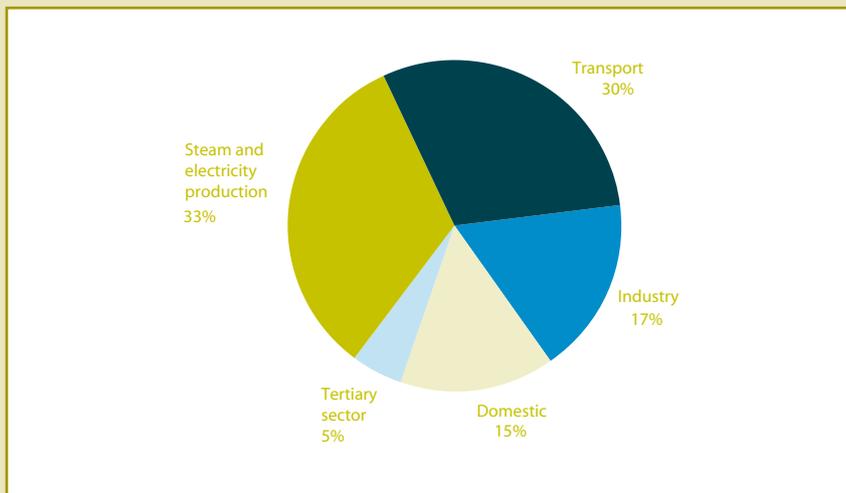
tion. Its operation is based on the following plan:

- A threshold or “cap” for the emission of greenhouse gases for each facility included in the emission trading scheme.



European Union percentage of CO₂ emissions per activity sector

Source: Green Book on Energy. Towards a European Strategy for the Security of Energy Supply



- This emission cap will be expressed in a number of emission quotas or rights for each facility. These quotas are interchangeable.
- Facilities will trade any excesses on their assigned quota.

Excesses on assigned quotas arise as a result of the incentive established by the market for those companies that invest in technology to reduce emissions, such as: using fuels with lower carbon intensity, employing more energy-efficient equipment, applying energy efficiency and saving methods, using facilities to trap and store greenhouse gases, etc.

III. Enagas' contribution

Of all greenhouse gases the one which has the greatest impact on global warming is carbon dioxide.

This is mainly produced in combustion processes and, in particular, those relating to the energy sector. In fact, 94% of all anthropogenic carbon dioxide emissions generated in Europe come from this sector.

As a result, the battle against global warming opts for the development of sustainable energy policies that favour or encourage the use of easily exploitable energy sources, as well as being profitable in economic terms, less carbon-intensive and more energy-efficient.

Of all energy sources, natural gas best represents this sustainability criteria, and is becoming the fuel being used in the move towards zero-emission technology.

The main component of natural gas is methane, which makes up about 90% of the product. Methane's mo-

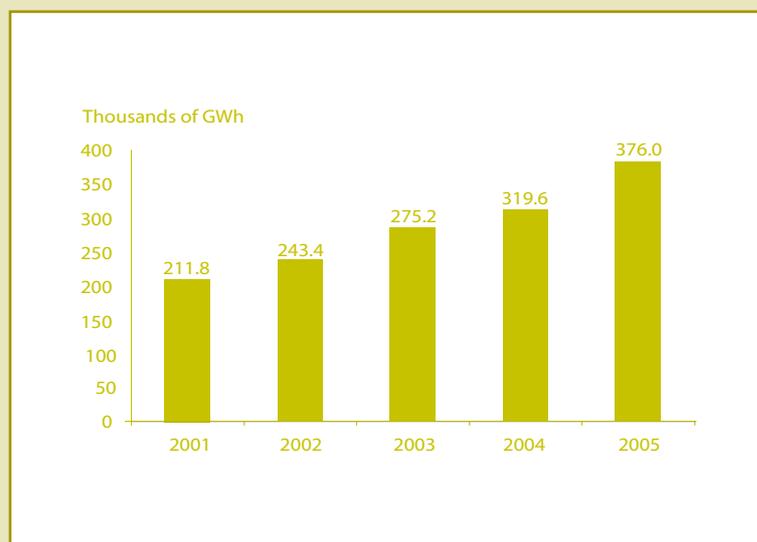
lecular structure has the lowest carbon-hydrogen ratio, meaning that, during combustion, it emits less carbon dioxide per energy unit than any other fossil fuel: some 30% less than those derived from oil, and 40-50% less than coal.

Furthermore, it does not contain sulphur, heavy hydrocarbons or any other impurities. When teamed with its wide range of uses and high usage performance, this makes it the **"cleanest of all fossil fuels"**.

As the main supplier of natural gas in Spain, Enagas contributes to minimise climate change by offering this fuel to the highest possible number of users, doing so in the most efficient manner, in environmental terms.

To do this, the group is constantly increasing its capacity for natural gas

Evolution of the demand in supplied gas

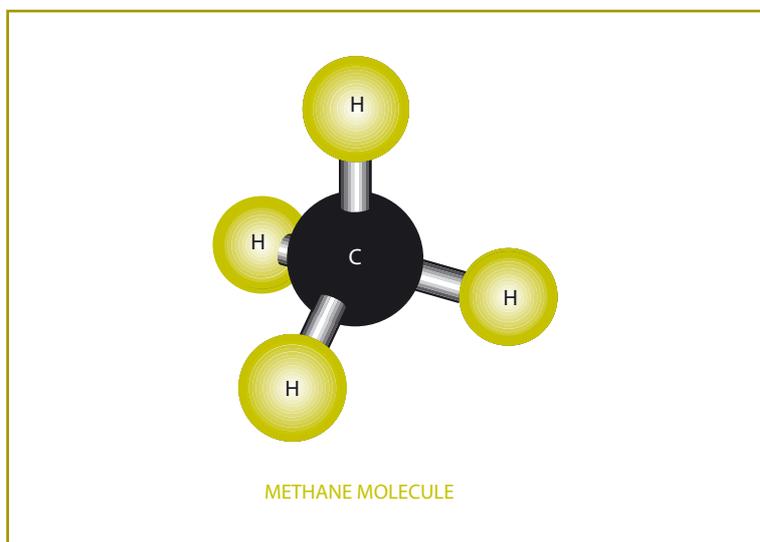


supply through the construction of new gas pipelines and compression stations. Enagas is also increasing the LNG emission and storage capacities in its regasification plants, as

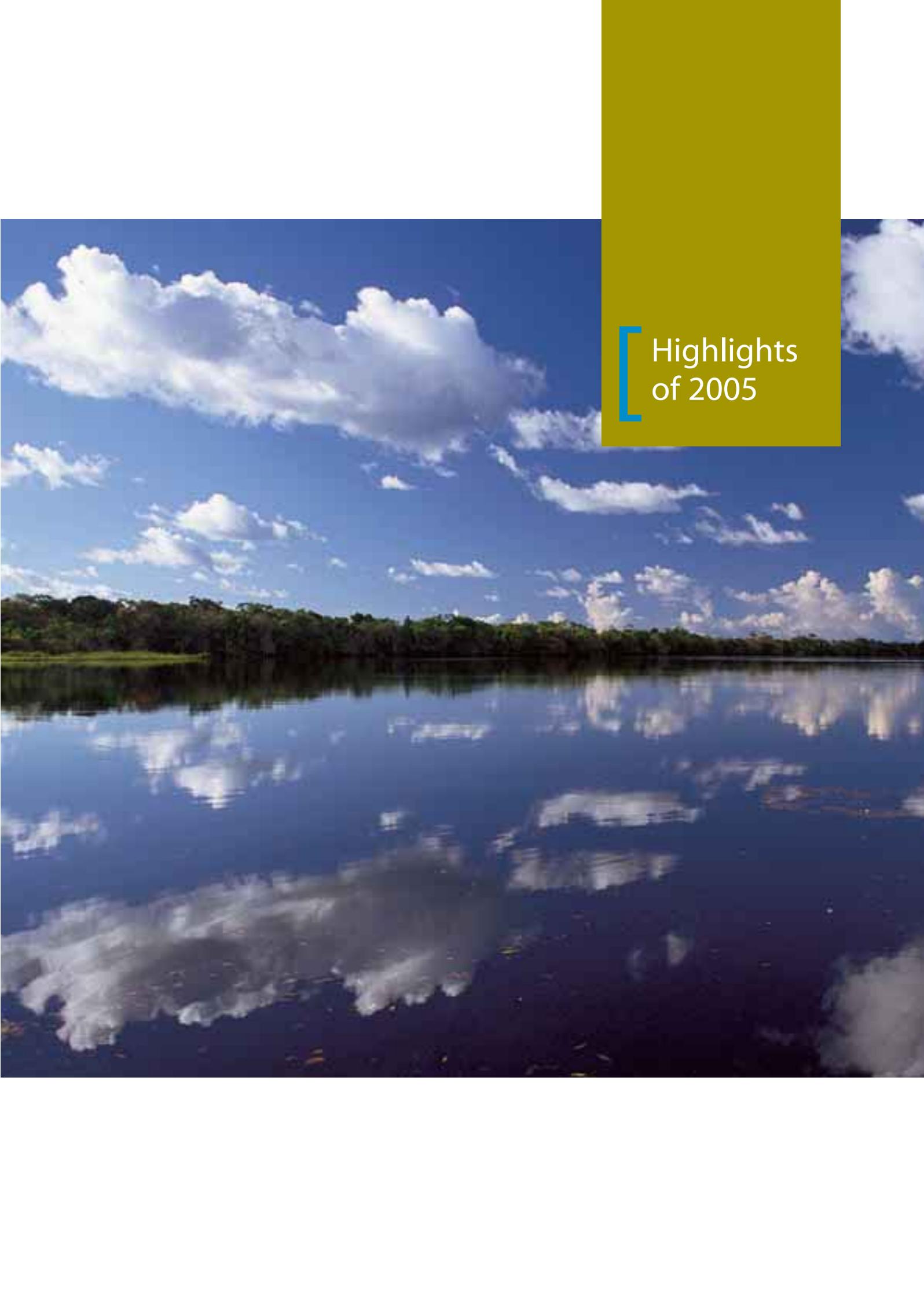
well as implementing the best technology available in these facilities. In line with our commitment to environmental protection, we have set ourselves the objective of reducing

our own greenhouse gas emissions through: the development of maintenance programmes for combustion facilities and energy-saving schemes, the installation of boil-off recovery equipment in the Barcelona plant, the use of quick opening ring seals in the gas pipeline venting areas, the elimination of natural gas emissions in the start-up of new compression units and the implementation of purging from air to gas procedures to avoid or reduce methane emissions.

All of these actions place carbon dioxide emissions at 393,406 tons, with a specific average emission of 1,166 tons for each GWh transported. Methane emissions reached 19,637 tons, which represents specific average emissions of 58.2 tons for each GWh of gas transported throughout the year.







Highlights
of 2005

Challenges in 2005

Challenges in 2005

2005 was characterised by two main factors. On the one hand, the third environmental Strategic Plan was approved, which will run from 2005 until 2010 and will draw together all the efforts that need to be made by the company if environmental objectives are to be met.

This Plan aims to ensure that all business-related decisions consider environmental protection as a priority, and to make sure that all of them aim to help Enagas contribute to the reduction of the greenhouse effect.

In this spirit, as a continuation of the activities laid out in the previous plan, the end of 2005 will see the implementation facilities to recover the boil-off produced in the Barcelona plant's LNG storage tanks, thus avoiding their emission into the atmosphere. With this in mind a compressor and reliquifier have been installed, improving the efficiency of the process and reducing contamination from greenhouse gas emission.

Furthermore, 2005 saw some changes in State Legislation that regulate the emission trading scheme, which had significant repercussions on Enagas facilities.

The **2005-2007 National Allocation Plan for Emission Rights** was approved by the European Commission. This was under the condition that the scope of the emissions trading scheme would be widened to include any combustion facility with more than 20 MW of thermal power, whether these are or are not linked to some electricity generation system.

This condition was finally incorporated into the domestic legal system after governmental approval of Royal Decree 5/2005, on March 11th, which involved urgent reforms to encourage productivity and improve public engagement.

In the case of Enagas, this amendment meant that the following facilities

were included in the greenhouse gas emissions trading scheme:



- Compression stations in Algete, Almendralejo, Almodóvar, Bañeras, Cordoba, Crevillente, Dos Hermanas, Haro, Paterna, Tivissa, Zamora and Zaragoza.
- LNG storage and regasification plants in Barcelona, Cartagena and Huelva.

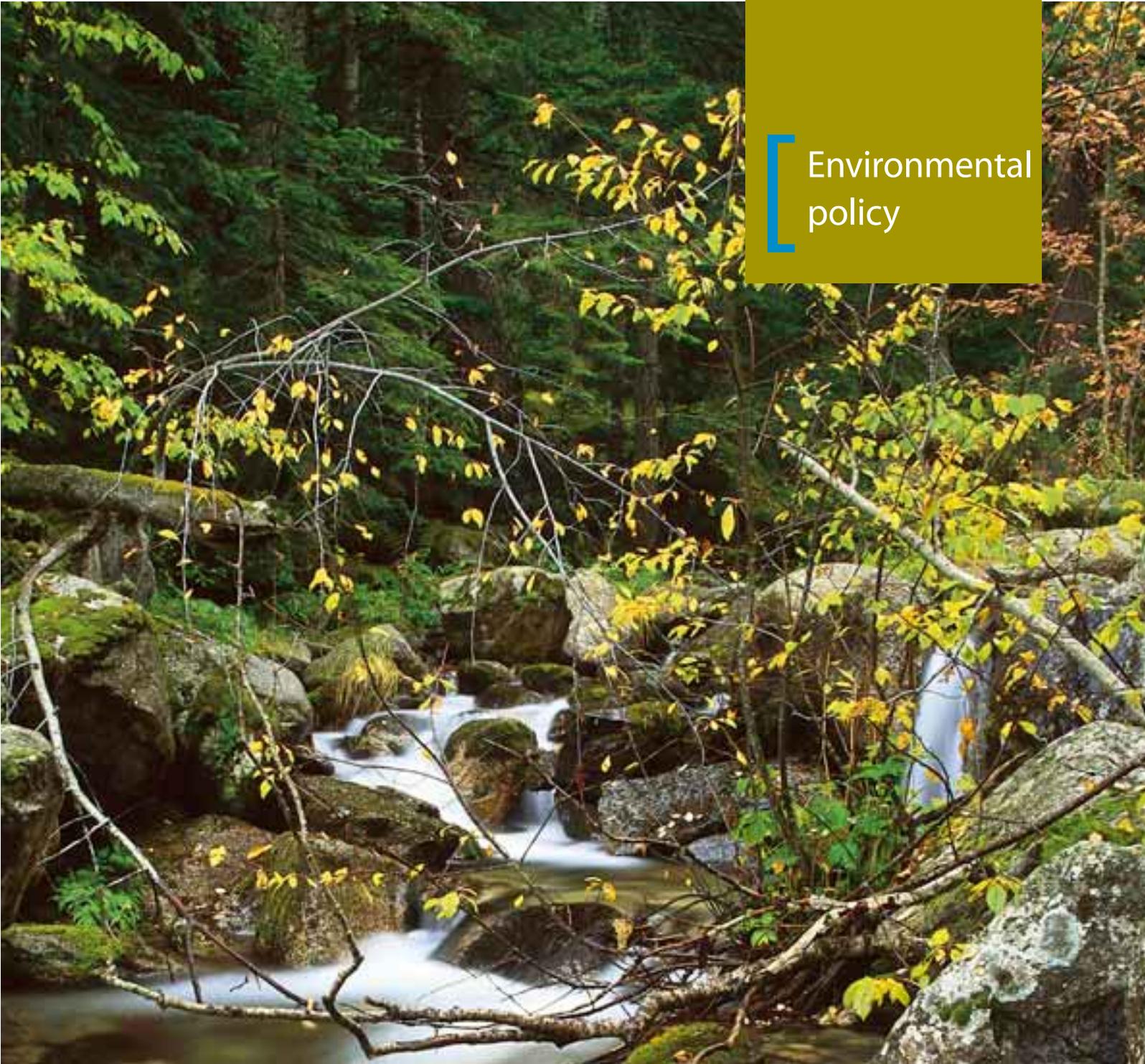
- Natural gas underground storage facilities in Serrablo.

Enagas has ensured that all these facilities have the mandatory **greenhouse gas emission authorisation** awarded by the relevant environmental body of the Autonomous Communities in which they are located. Addi-

tionally, they have been provisionally given the **emission rights** requested for each of them for 2006 and 2007. Likewise, in 2005 the foundations were laid for the establishment of a system to allow the monitoring and notification of greenhouse gas emissions from these facilities.







Environmental
policy

ena

Preserving the environment is one of the main concerns when it comes to activity at Enagas. In this spirit, Enagas states and assumes the following environmental commitments and principles:

ENVIRONMENTAL COMMITMENT

To develop company activities in a way that is respectful of the environment, paying particular attention to protecting the surrounding area, our clients and the general public.

ENVIRONMENTAL PRINCIPLES

Minimising impact.

To continually dedicate effort to identifying, classifying and improving any environmental impacts that come about as a result of company activity at facilities, and strive to attain efficient usage of these.

Continuous adaptation to applicable regulations.

To meet all environmental legislation applicable to company facilities and activity. To keep in mind international norms and legislative trends when planning those activities that may have a significant environmental impact, especially in those areas which lack applicable legislation.

Prevention of contamination and evaluation of potential risks.

To apply the basic principle of contamination prevention and potential risk evaluation, from the planning and decision-making process right up to the execution and implementation of operations involved with new projects.

Environmental collaboration.

To collaborate, where necessary, with the different administrative bodies, nongovernmental organisations and public or private bodies in the search for solutions to any environmental problems or issues that may arise.

Incorporation of environmental criteria when dealing with contractors.

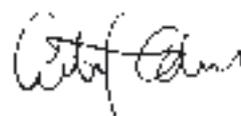
To incorporate environmental criteria when taking decisions on awarding contracts for the provision of products and services, as well as informing those contractors that work with Enagas of any applicable environmental procedures or requirements.

Environmental Communication and Information.

To encourage internal and external environmental communication based on transparency, informing both employees and the general public of the objectives met and any work in progress relating to aspects of environmental control.

Continuous improvement.

To achieve continuous improvement through the systematic and regular environmental evaluation of the Environmental Management System, using the elaboration of the Environmental Audits as a basic tool for this.



Antonio González-Adalid
Chairman





Environmental
management
at Enagas

Environmental management at Enagas

Environmental management at Enagas

In its commitment to sustainable development, Enagas has integrated environmental protection into the Company's policies and strategic programmes. To do this, the company has gradually implemented an environmental management system certified by AENOR in accordance with the UNE-EN-ISO 14.001 norm. This is applicable to the following operational units:

- LNG storage and regasification plants in Barcelona, Cartagena and Huelva.
- Underground storage at Serrablo.
- Transport management maintenance areas.
- Technology Unit.



This system detects and evaluates the environmental aspects of activity in these areas, setting a series of objectives and goals with the aim of reaching higher levels of environmental performance in all Company activity. In the same spirit, Enagas has identified the environmental impact that may arise from infrastructure projects, opting for the best feasible option and carrying out environmental control during the different stages of the project's development: planning, development and implementation.

I. Organisation

Environmental management is a responsibility that is shared by the entire Enagas company. This is aided by the existence of an organisational structure that plans, coordinates and integrates the environmental measures and actions that are seen through all levels of the Company.

- **Environmental Committee:** This is the ultimate environmental decision-making body, and is responsible for establishing the basic lines of action to meet the terms of the Environmental Policy. This body approves the environmental strategic plan, integrated within the Company's strategic plan, reviews its implementation and guarantees the sufficient human, technological and financial resources for its compliance.
- **Prevention and Environment Unit:** This unit is responsible for implementing Committee decisions and coordinating the actions of the environmental groups, with whom regular meetings should be held. Among other functions, the

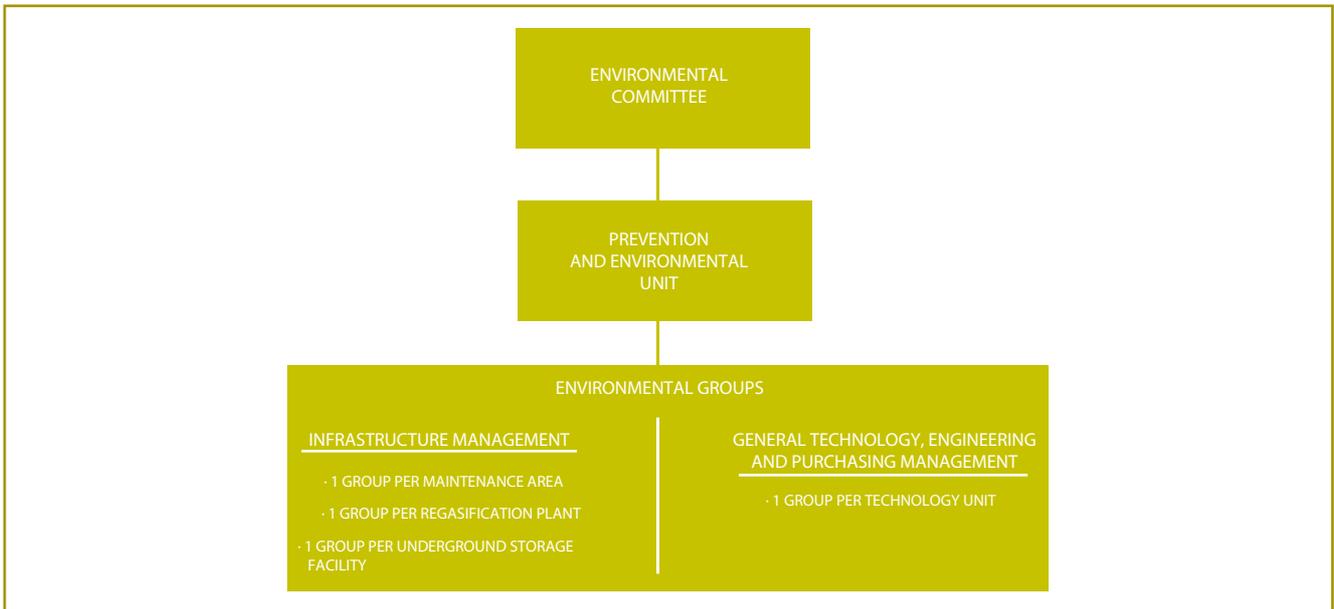
Unit reviews, updates and distributes all applicable regulations, as well as drawing up work plans and compiling the Environmental Report.

- **Environmental groups:** These groups are responsible for implementing the established directives and ensuring compliance with system requirements. The following groups have been organised: In addition, a work group has been created to unify the environmental criteria of the plants and the underground storage facilities at Serrablo, made up of environmental managers from the facilities and technical staff from the Prevention and Environment Unit.

II. Environmental Management System

Any form of activity will have some impact on the environment which surrounds it, in particularly with respect to the physical environment and natural resources. The ultimate goal of an environmental management system is that of controlling the environmental aspects deriving from an

Organisation of environmental management



organisation, as well as availing of the adequate mechanisms to reduce impact on the environment. The environmental management system used in Enagas facilities is ba-

sed on the UNE-EN-ISO 14.001 norm, and it is from this norm that the system's document structure is derived. In addition to the environmental policy, there is also a manual which is the ba-

se reference for defining and developing the system. This brings together a series of general procedures that set out responsibilities and the way in which any operations that may have significant environmental impact should be carried out, thus ensuring compliance with applicable legislation and the requirements of the aforementioned norm.

Furthermore, in order to more comprehensively regulate certain activities or operations, specific procedures or technical instructions have been developed.

The formats and records represent the information that is generated during the operation of the system.

Through the environment management system, Enagas controls the environmental aspects of those facilities in operation, which can be summed up as follows:

- Atmospheric emissions: these are emissions of natural gas and contaminating gases that come

Documentation plan for the SIGMA (Environmental Management System)

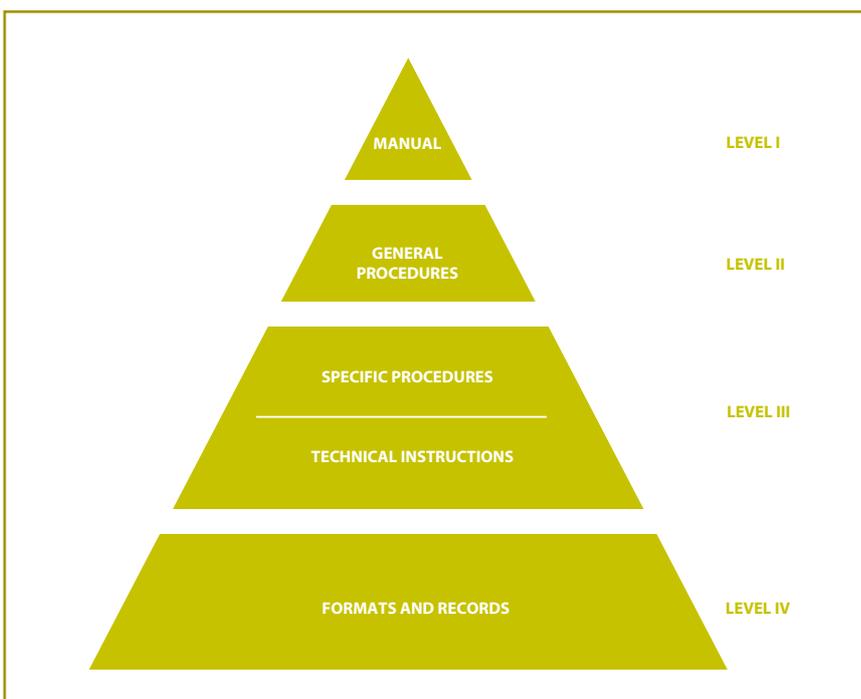


Table 1: Summary of Enagas' main environmental aspects

ATMOSPHERIC EMISSIONS	NOISE	WATER DISCHARGES	WASTE	NATURAL RESOURCE CONSUMPTION	SOIL CONTAMINATION
CH ₄ CO ₂ NO _x CO	OPERATION OF RMS'S, CS'S AND PLANTS	SANITATION RAIN REFRIGERATION	DANGEROUS NON-DANGEROUS	WATER ELECTRICITY NATURAL GAS	CHEMICAL SPILLAGES

from the combustion facilities. To control and reduce them annual maintenance and measurement programmes have been set up, which ensure that the facilities are operating correctly.

- Noise: mainly generated in plants, compression stations (CS) and regulation and measurement stations (RMS). Regular measurements are taken of the noise produced, and the necessary steps are taken to reduce the impact of this noise.
- Residual water discharges: these are made up of sanitary and refrigeration water from the plants. Each year supervision and measurement programmes are created, with the aim of guaranteeing minimum environmental contamination.
- Waste: dangerous and non-dangerous. All of these are separated and stored in accordance with applicable legislation, before being handed over to an authorised treatment company. Quarterly inspections are also carried out to check that the waste storage conditions are adequate.
- Natural resource consumption: water, electricity and natural gas. This consumption is measured and

recorded, and actions for reduction are defined.

- Soil Contamination: Enagas activity is considered, and the possibility impact this may have evaluated, with the adequate containment and spillage prevention measures implemented.

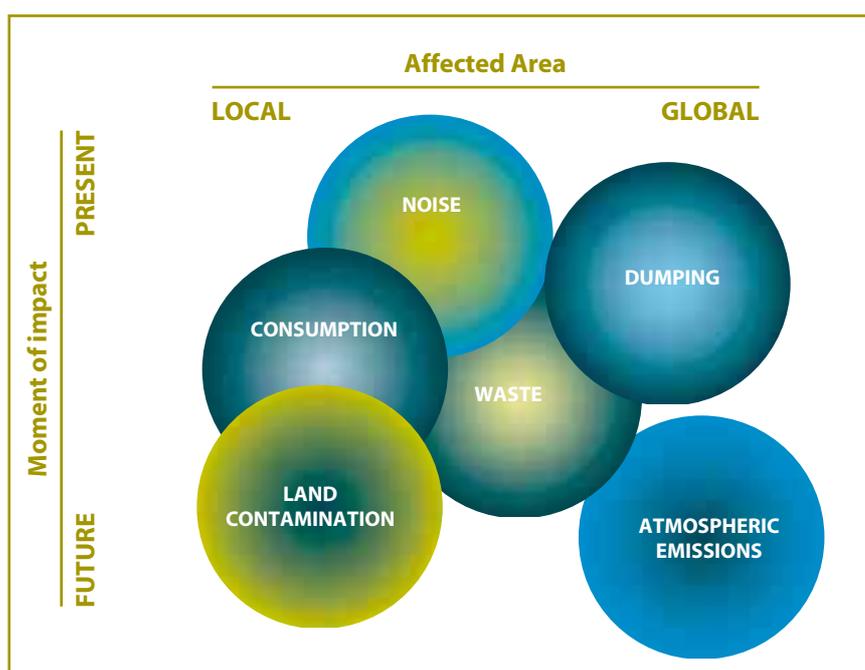
The most significant aspects of Enagas facilities are self-supply, atmospheric emissions and the noise produced by certain facilities. However,

each aspect will have an impact which may have an impact, either now or in the future, and in a more or less extended area.

III. Environmental Management in Projects

Enagas plans, projects and constructs its infrastructure projects in constant consideration of environmental protection. As a result of this, special at-

Main environmental aspects





tention is paid to environmental topics when it comes to drawing up projects, identifying the possible impact these may have and opting for a feasible alternative that will have the least impact on the environment.

When the impact is unavoidable, the next stage is to define, for the different stages of the project, the corresponding ways in which to minimise and/or correct this impact. The measures used by Enagas to guarantee correct environmental management when constructing infrastructures are:

PLANNING PHASE:

- Selecting alternatives: the basic plans or alternatives are studied, with those having the least impact chosen.
- Basic project and environmental impact study: a study is carried out on its impact, identifying the measures to be used to minimise these. The presentation of the impact

study to the environmental agency sees the start of the impact evaluation stage for the projects established by applicable legislation.

- Corrective measures project: specific activities are defined to minimise the impact that may arise during the project's construction.
- Environmental monitoring plan: on-site checks are carried out to ensure compliance with all the requirements applicable to the project.

CONSTRUCTION STAGE:

- Environmental monitoring: on-site checks of the proper execution of the planned minimising and corrective measures, with particular focus on the terms of the environmental impact declaration. Information is also provided on the most relevant events occurring during this stage.
- Control of contractors: Enagas will inform its contractors of the pro-

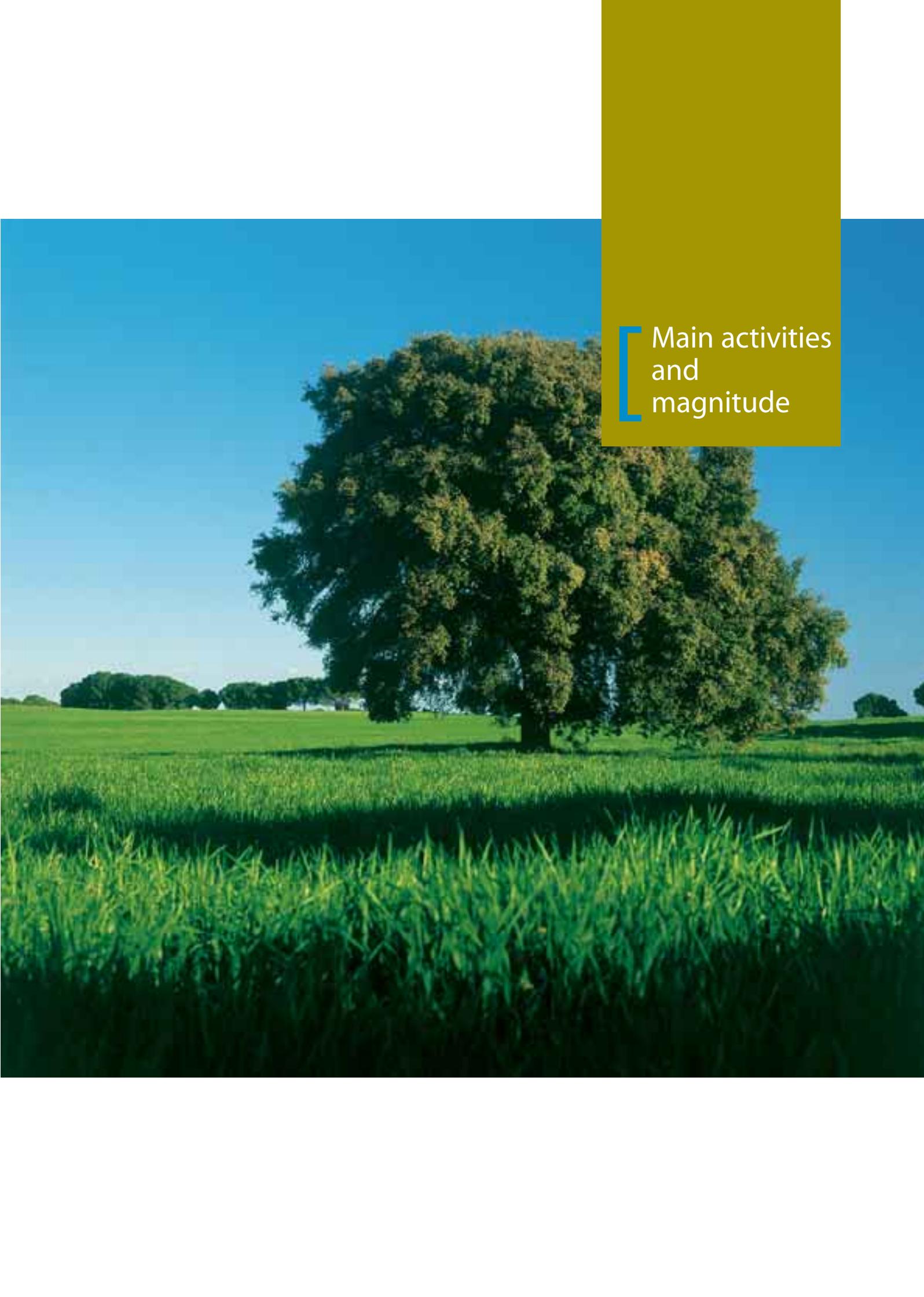
ject's environmental requirements, in addition to obliging them to draw up an environmental management plan.

- On-site environmental auditing: the Central Technical Office will carry out regular audits to verify compliance with the environmental requirements applicable to each project.

POST-WORK PHASE

- Restoring the land to its original state.
- Revegetation of the natural areas affected by the project.
- Environmental controls prior to the start-up of operations at the facilities: measurements, inspections, etc.
- Subsequent follow-up: over the following years monitoring will be carried out to guarantee the success of the plants, as well as the effectiveness of the corrective measures implemented.



A large, leafy tree stands in the center of a green field under a clear blue sky. The foreground is filled with tall, green grass. In the background, there are more trees and a clear horizon line.

Main activities
and
magnitude

Main activities and magnitude

Main activities and magnitude

I. Environmental strategic plan

In order to meet the environmental goals set for each year, the following activities have also been carried out: Of these objectives, the following are of particular importance:

Objectives of the Enagas environmental strategic plan

AREAS	OBJECTIVES	COMPLIANCE
Reduction in greenhouse gas emissions	Reduction in natural gas emissions	Installation of quick-opening ring seals in the venting chimneys on the pipeline, thus reducing leaks via the valves.
		Installation of a compressor in the Huelva plant to increase the quality of gas driven to the reliquefier and reduce the amount of gas burned at the refinery flare.
		Construction of a security flare, a reliquefier and a compressor in the Barcelona plant to recover the boil-off produced, and to eliminate natural gas leakage into the atmosphere.
Energy saving and efficiency	Reduction in consumption	Elimination of emissions in the start-up of compression stations through the installation of an electrical start-up system in the turbocompressors. This system was installed in the three turbocompressors in the Dos Hermanas and Tivissa compression stations, as well as the two new stations in Bañeras and in Almendralejo.
		Installation of programmable control points in the regulation and measurement stations, with the aim of better controlling gas temperature and reducing self-supply in the boilers.
Prevention of soil contamination	Improvements in waste management	Reduction in the self-supply/regasified gas ratio in the Barcelona and Cartagena plants through the installation of two new seawater vaporisers to increase energy efficiency in each plant.
		Separation of non-dangerous plastics from solid urban waste in the Transport Department centres.
	Improvements in spillage control and prevention	Improvements in those facilities within the Barcelona plant that house THT (tetrahydrothiophene) deposits, thus avoiding the mixing with rainwater and thus minimising "water with THT" residues.
		Relocation of the Barcelona plant's waste storage facilities to a more suitable area.
		Carrying out safety tests on underground oil deposits and the collection of condensates from filters in the Paqterna, Cordoba, Zamora and Haro compression stations.
	Improvements in the purification process	Waterproofing of the drainage oil collection chambers in the Zamora and Tivissa compression stations.
Creation of a database with the security specifications of all dangerous products in the north maintenance area centres.		
Protection of surroundings	Noise reduction in regulating and measuring stations	Installation of double-walled deposits for used oils and filter condensates with leak detection systems in the Bañeras and Tivissa compression stations.
		Installation of an inverted grading chamber in the dumping points of the Zamora compression station.
		Elimination of the septic tank in the supervisor's shelter in the Dos Hermanas compression station.
		End of the study into noise reduction measures and the modification of design specifications for future stations.

Of these objectives, the following are of particular importance:

- Reduction of natural gas emissions in the Barcelona plant: the installation of a new compressor and reli-quefier will allow for the recovery of a large percentage of the boil-off generated by the storage tanks, thus avoiding their escape into the atmosphere. The excess boil-off that cannot be treated by the reli-quefier will be sent to the new security refinery flare, where it will be burnt. Combustion at the flare will produce carbon dioxide emission, which is much less contaminating than the methane which is emitted at the vent. In this way the process is made more efficient as a large percentage of the natural gas is recovered, and contamination through greenhouse gases is also reduced.
- Elimination of natural gas emissions in the start-up of compression stations: the start-up of current turbocompressors is carried out through the expansion of the natural gas that is supplied from the gas pipeline via a turbine. This gas is not subsequently used for any purpose, and it released into the atmosphere. In order to eliminate these emissions, the new turbocompressors are installed with an electrical start-up system, instead of using natural gas.

In addition, it is important to highlight those objectives relating to reductions in greenhouse gas emissions related to energy consumption in electrical energy production. These are currently awaiting budgetary approval in order to carry out projects,

which will be implemented from 2006 onwards. These projects are:

- Electricity generation in compression stations: this aims to recover the heat contained in turbocompressor escape gases for its subsequent use in electricity generation.
- Electricity generation in regulating and measuring stations: in these facilities gas pressure is regulated, up until its distribution. This project aims to use the jump in pressure produced in the regulation process in order to generate electricity through an expansion turbine.
- Electricity generation in regasification stations: liquid natural gas may be used as a cold source, and seawater as a hot source, to produce electricity through an inter-

mediary flow and an expansion turbine. In this way, it is possible to make full use of the energy contained in the liquid natural gas.

II. Training

Positive environmental performance requires that all Enagas employees are given adequate training for their particular posts, as well as being trained on the environmental aspects relating to their activity. This leads to increased knowledge and, as a result, heightened respect for the environment.

Throughout 2005 the following activities were undertaken:

- Training course on the environmental management system for those responsible for environmental issues in work centres.





- Elaboration of a waste management guide to be distributed in all work centres.

In addition, certain staff members attended the following courses in order to complete their environmental training:

- CO₂ Workshops (Spanish Institute for Energy)
- Course on integrated environmental authorisation (Spanish Institute for Energy)
- Environmental energy solutions. CO₂ Sequestration (Spanish Institute for Energy)
- Control of dumping, emissions, consumption and noise (AENOR)
- Evaluation of industry-related environmental risks (ITSEMAP)

- 2nd European Hydrogen Conference.
- Renewable Energy Plan (Spanish Institute for Energy)

All the above represented 267 hours of training, with a total associated cost of 5,750 euros.

III. Auditing

At Enagas, throughout the year various audits were carried out on construction activities and the environmental management system implemented in the company's operational units, thus evaluating their environmental performance.

The environmental management system audits serve to check the le-

vels of implementation of this system in the company. These auditing activities fall into two categories: internal audits, carried out by specialist companies, and certification audits, carried out by AENOR.

In 2005 the following work centres were audited:

- Underground storage at Serrablo
- Technology Unit.
- Regasification plants in Barcelona, Cartagena and Huelva.
- 15 maintenance, operations and control centre, 3 compression stations and 6 maintenance centres with compression station.

Auditing activities relating to construction activities are carried out in order to evaluate compliance with the environmental factors of each project. These factors are those included in the environmental impact declarations all applicable legislation, and also include those factors relating to Enagas environmental policy.



This year saw 19 audits carried out on the following projects:

- Extensions to: the Barcelona and Huelva plants and the Seville, Tivissa and Bañeras compression stations.
- The Castelnou – Fraga – Tamarite, Arbós – Tivissa and Málaga – Estepona gas pipelines.

IV. Activities relating to infrastructure projects

ENVIRONMENTAL STUDIES

A chapter of each construction project is dedicated to the environmental impact study. These consider the environmental values of the zones in which the projects are to be situated, and allow the design of the necessary measures in order to adequately protect the surrounding area.

The studies are then presented to the Ministry for the Environment, so that the environmental feasibility of the project can be stated through the environmental impact declaration. This

year, the following impact declarations were achieved:

- 4th liquid natural gas storage tank in the Cartagena plant.
- Increase of emission capacity to 1,200,000 m³(n)/h for the Cartagena plant.
- The Semianillo gas pipeline in south-western Madrid (Section I).
- Castellón – Onda gas pipeline.
- Falces – Irurzun.

Furthermore, it was resolved that the Ministry for the Environment would adopt the decision not to submit the following projects to environmental evaluation:

- Increase of emission capacity to 1,350,000 m³(n)/h for the Huelva plant.
- Saica gas pipeline.
- Zaragoza Compression Station.

PROTECTIVE MEASURES

During each project a series of measures are adopted to ensure maximum environmental protection the area in question, as well as to minimi-

se the possible impact of the project. Said measures can be summed up as follows:

- The planned initial section of the Falces – Irurzun pipeline was modified to avoid any negative impact on the *Yesos de la Ribera Estellesa* LIC (Area of Community Interest) and the *Pinares de Lerín* natural reserve. The Castellón – Onda pipeline was also re-considered to avoid crossing the River Mijares and an area with high probability of housing archaeological remains.
- Land and vegetation protection: use of a restricted working area, which is clearly marked out, preservation of the upper layer of plant life and the design of a fire prevention plan.
- Fauna protection: thorough examination of the area, before any machinery arrives, to check for burrows, nests or other such areas, temporary restrictions on work during the birthing or subsequent rearing periods, regular inspections of the trenches or pipeline covers to ensure that no animals become trapped, etc.
- Protection of water courses: carry out crossings at the lowest water level, using excavation material to restore the riverbed, use of protective coverings to ensure water flow and implementation of solid retention systems. In cases of high ecological importance directional drilling will be carried out, protecting the watercourse as well as vegetation flourishing on the bank. In 2005 this technique was used to cross the Segura and Cinca Rivers, with a drilling depth of 158 and 274 metres, respectively.



MONITORING PLANS

Environmental monitoring ensures compliance with the planned protective measures. Additionally, during the construction phase it enables the identification of those repercussions that were not initially foreseen, thus facilitating the adoption and implementation of suitable corrective measures. The results of this monitoring is seen in the monitoring reports which are drawn up by specialised technicians after visiting the work areas.

Environmental monitoring is completed with the monitoring of the gas pipelines being exploited. Throughout 2005, approximately 1,000 km of gas pipeline was monitored.

Environmental monitoring and the monitoring of areas being worked upon represented investment of 0.5 million euros in 2005.

LANDSCAPE RESTORATION

One of Enagas' foremost objectives is integration into the surrounding en-



vironment for all of its construction projects.

In order to do so, restoration work is carried out in the affected areas, divided into two phases. The first of these is land restoration, which consists in restoring the soil on which corporate structures lie, replacing plant li-

fe, watercourses and infrastructures that have been traversed, such as roadways and livestock tracks. The second phase consists of the revegetation of the affected areas, using indigenous plant species.

During 2005 more than 750,000 m² of land was revegetated, and some 4.1 million m² was restored. Investment in this area rose to 5.7 million euros.

ARCHAEOLOGICAL PROTECTION

Enagas carries out archaeological studies in the areas in which new infrastructures are to be developed, all in the spirit of protecting cultural heritage. These studies are completed with on-site inspections during the construction phase.

During 2005, 0.25 million euros were invested in archaeological protection studies, without any finds of importance being discovered.

Landscape restoration carried out

Autonomous Community	Revegetated area (m ²)	Restored area (m ²)
Andalucía	433,746	606,284
Aragón		1,095,192
Castilla – La Mancha	172,107	
Cataluña		1,661,474
Madrid	157,867	
Murcia		728,420
Total	763,720	4,091,370

V. Environmental scope for facilities

ATMOSPHERIC EMISSIONS

The exhaustive control carried by Enagas into its emissions into the atmosphere has allowed, on the one hand, compliance in 2005 with emission limits as set by applicable legislation and, on the other, verification that all company facilities are functioning correctly.

The most significant emissions are those from natural gas, which correspond to the start-up and stopping of compression stations, the introduction of gas into new sections of gas pipeline and, mainly, the Barcelona regasification plant, as well as the pollutants deriving from the combustion sources.

This year 30.9 million m³(n) of natural gas was emitted, which represented 0.11% of the total amount of gas transported. This quantity translates into 19,637 tons of methane; in other words, average emission of 58.2 kg for each GWh of transported gas.

Carbon dioxide emissions generated by combustion sources, such as boilers, submerged combustion vaporisers or turbines, as well as those emissions originating from the security flares, reached 393,406 tons, with

Atmospheric emissions generated by Enagas activity

Areas of activity	Natural Gas [thousands of m ³ (n)]	Combustion sources		
		CO ₂ (t)	CO (t)	NO _x (t)
Regasification plants	27,273	67,736	13	3
Serrablo underground storage facility	44	35,625	10	4
Basic pipeline network	3,552	290,045	32	34
Total	30,869	393,406	55	41

Specific emission in relation to quantity of gas transported

Pollutant	Specific emission [kg/GWh]
CH ₄	58.21
CO ₂	1,116.24
CO	0.16
NO _x	0.12

an average emission of 1.17 kg for each GWh of transported gas.

NOISE EMISSION

Evaluating facility noise levels is a fundamental step in controlling the impact this noise may have on the surrounding environment. Not only that, but it also identifies exactly which facilities require the implementation of measures to reduce this impact.

During 2005, noise measurements were taken outside 44 facilities, all demonstrating high levels of compliance with the limits set by local or regional legislation.

In addition, the study of noise reduction measurements in regulating stations was concluded, and an action plan was drawn up for those stations which exceeded legal limits. The conclusions of this study will also be born in mind when designing new regulating stations.





RESIDUAL WATER DISCHARGES

In accordance with the monitoring programmes established for 2005, 30 discharge analyses were carried out in 13 centres in the basic pipeline network. In addition, the relevant controls on refrigeration waters in the regasification plants were also implemented, thus complying with the requirements of the respective discharge authorisations. This provided information on how well the treatment and purification systems were working.

WASTE MANAGEMENT

In 2005 Enagas managed more than 2,200 tons of waste, all of which was subsequently handed over to specialist companies for treatment of recycling purposes. The amount of waste that was recovered represented 11% of the total amount of waste generated.

As a result, this waste management led to savings of more than 0.4 million euros.

ENERGY CONSUMPTION

Throughout 2005 the total energy consumed in all Enagas facilities rose to 1.956 GWh, or 0.58% of the total energy transported.

Of the total energy consumed, 87.3% was down to natural gas self-supply, with the remaining 12.7% corresponding to electrical energy consumption.

The majority of energy consumption (68%) was produced in the basic pipeline network's compression stations.

Amounts of waste generated by Enagas

Hazardous waste	Ton
Methanol water	1,840.0
Other mixed liquids: oily water, shavings, TEG, pollutant solvents, etc	81.4
Absorbent material and gravel	17.6
Used batteries	10.0
Empty chemical containers	7.4
Used oil and lubricants	6.1
Oil filters	1.5
Fluorescent tubes	0.9
Batteries	0.6
Asbestos waste	0.2
Aerosols	0.2
TOTAL hazardous waste	1,965.9

Non-hazardous waste	Ton
Rubble and other residue	79.1
Cardboard and paper	60.7
Scrap metal	54.6
Septic tank sludge	43.8
Recyclable plastics	4.0
Wood	2.4
Others	3.1
TOTAL non-hazardous waste	247.7

Electricity consumption in Enagas facilities

Areas of activity	Cantidad (GWh)
Regasification plants	373
Serrablo underground storage facility	131
Basic pipeline network	1,452
Total	1,956







Environmental
expenditure
and investment

Environmental expenditure and investment

Summary of expenditure and investment

Activity	Value (thousand Euros)
Development, implementation and monitoring of the environmental management plan	100
Supervisory and control campaigns for noise, emissions and spillages	261
Waste management	441
Compliance with the aims of the environmental strategic plan	14,445
Environmental studies	254
Archaeological studies and projects	249
On-site environmental monitoring	528
Landscape restoration	6,323
Directional and horizontal drilling	2,000
Other environmental improvements	491
Total	25,092



Environmental expenditure and investment

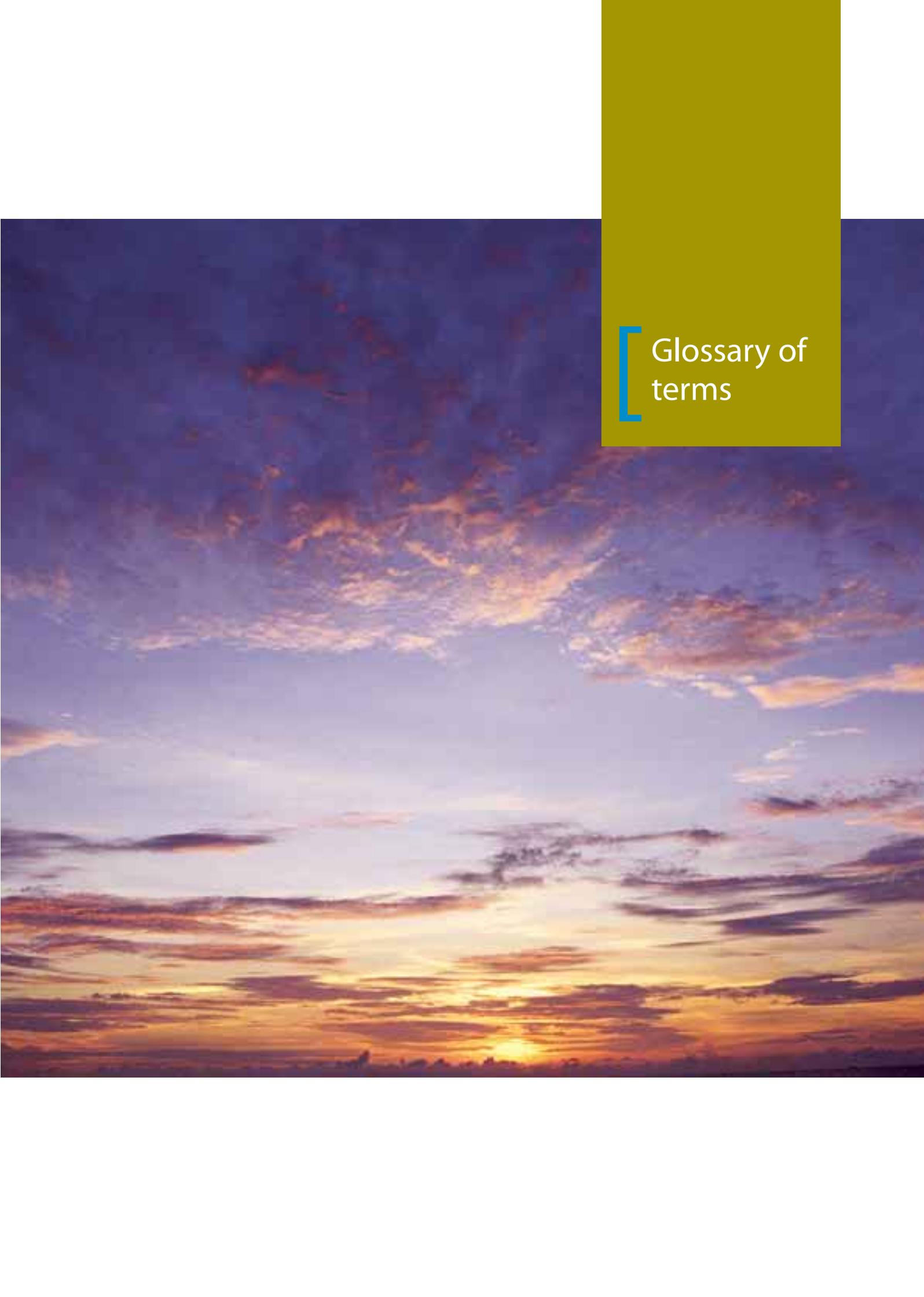
Enagas identifies and evaluates its environmental costs in order to control those financial resources which it dedicates to guaranteeing commitment to environmental respect and protection.

The budget for expenditure and investment relating to environmental activities carried out through the diverse programmes implemented in 2005 was 25.1 million euros.

From this, the most significant part corresponded to the project for eliminating methane atmospheric emissions, which was introduced in the Barcelona plant at a cost of 13.5 million euros.







Glossary of
terms

Glossary of terms

Glossary of terms

Environmental aspect: element of an organisation's activities, products or services that can interact with the environment.

Environmental audit: systematic, documented verification process to determine if an organisation's environmental management system corresponds to the reference regulations employed in its design and implementation.

Boil-off: vapours resulting from the spontaneous evaporation of natural gas in a liquid phase.

Environmental certification: official confirmation by an accredited environmental certifier of compliance with the requirements of a determined standard.

Combined cycle: system that combines the production of electricity in a gas turbine and steam turbine, by the recuperation of residual energy from the exhaust gases of the former.

Contamination: alteration of the physical, chemical or biological characteristics of the environment as a result of human activity. Contamination may be seen on a local, regional or even global scale, as in the case of the greenhouse effect, acid rain and the disappearance of the ozone layer, etc.

Sustainable development: development that satisfies the needs of current generations without hindering the capacity of future generations to satisfy their own needs

(Brundtland Report, 1987).

Environmental Impact Declaration (EID): declaration by the competent environmental authority, in which

Environmental behaviour: measurable results of the environmental management system.

Emission right: entitlement to emit



the appropriateness (or lack thereof) of executing the proposed activity is determined. If the declaration is affirmative, the conditions that must be established for the suitable conservation of the environment and natural resources are determined.

one ton of carbon dioxide during a specific period.

Environmental Impact Study: technical document that the author of a project must present and which forms the basis for the Environmental Impact Declaration.

Evaluation of Environmental Impact: set of studies and technical systems that allows the estimation of the effects that the execution of a given project, works or activity will have on the environment.

Renewable Energy: inexhaustible energy sources which are periodically available for human use; man

pressure, the equilibrium temperature is - 161°C.

Greenhouse Gases (GG): gases that allow solar radiation to enter, but do not allow infrared radiation emitted by the Earth to escape to the exterior. The Kyoto Protocol refers to the following gases: carbon dioxide, methane, nitrous oxide, sulphuric hexafluoro-

habitats listed in Appendix I of Directive 92/43 and the habitats of the species in Appendix II, according to the representation of said habitats in the respective territories of the Member States.

UNE-EN ISO 14001 Standard: international standard for environmental management systems. It is the reference standard for the Enagas system.

Environmental objective: environment target of a general nature, which originates in an organisation's individual environmental policy, and which is quantified whenever possible.

Environmental Policy: declaration by an organisation of its intentions and principles with regard to its general environmental behaviour. It provides an action framework for the establishment of its environmental objectives and goals.

Reliquefier: equipment which condenses the boil-off generated to turn it back into LNG.

Waste: any substance or object of which its owner disposes or of which the owner has the obligation or intention to dispose.

Hazardous Waste: those materials which have been classified as such by relevant legislation.

Environmental Management

System: part of the general management system which includes the organisational structure, activity planning, responsibilities, practices, procedures, processes and resources to develop, implement, execute, revise and update environmental policy.



must be able to utilise and transform them into useful energy. This concept includes hydroelectric, wind, solar, biomass, tidal, geothermal and wave energy.

Liquid Natural Gas (LNG): natural gas in liquid state. At atmospheric

ride, perfluorocarbons and hydrofluorocarbons.

Energy Intensity: ratio between energy consumption and Gross Domestic Product (GDP).

Site of Community Importance (SCI): areas which feature the natural

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